### The London School of Economics and Political Science

# Context-Driven Choices: Environmental Valuation in the Courtroom

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A thesis submitted to the Department of Law of the London School of Economics and Political Science for the degree of Doctor of Philosophy

London, September 2019

### Acknowledgements

My supervisors, Veerle Heyvaert and Margot Salomon for their wisdom, guidance and encouragement, and for seeing connections which I would not have found on my own.

Veerle (again!) for Transnational Environmental Law, and Joe Mazor and Alex Voorhoeve for Philosophy of Economics – both courses which I took during my LLM at LSE in 2014–15, and which directly inspired this thesis.

Martin Loughlin, Tatiana Flessas and Stephen Humphreys for commenting on drafts of early chapters.

Joana Setzer and my fellow-travellers on the LSE PhD journey – Aaron, Tanj, Zlatin and others, too many to name – for conversations, support and friendship.

The LSE Law Department for generous financial support, and almost equally importantly, a happy and stimulating research environment.

Dan Farber for hosting me at UC Berkeley (where I did the research for Chapter 3), and Flemming Gerhardt Nielsen, Jan Komárek and the late Anita Rønne of Copenhagen University (where I wrote most of Chapter 8).

Dr Satyajit Banerjee, my high-school chemistry teacher and moonlighting environmentalist, Dr Nandan Nawn and the late Shamnad Basheer who taught me at university, and my friend Lahiri who instructed me in the dark arts of Microsoft Word formatting.

My friends in London – Abira, Sarbajeet, Saha, Aditi, Rohini, Sarathy, Shekhar, Natalie and many others – for unconditional love, support, and distractions when I needed it (and sometimes when I did not).

My parents and my extended family of aunts, uncles, cousins and grandparents for encouraging me in whatever I have wanted to pursue, and for believing in me more than I believe in myself.

My brother, Sujaan, who is an inspiration as a researcher and as a person.

Anasua, for everything.

### Declaration

I certify that the thesis I have presented for examination for the MPhil/PhD degree of the London School of Economics and Political Science is solely my own work other than where I have clearly indicated that it is the work of others (in which case the extent of any work carried out jointly by me and any other person is clearly identified in it).

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### Abstract

This thesis investigates legal cases involving environmental valuation, that is, the exercise of putting a monetary value on environmental goods, services and amenities. There is a vast economics literature on environmental valuation, but relatively little legal literature on the use of environmental valuation in the courtroom. Nevertheless, environmental valuation is relevant, or even central, to a range of cases – for example, when courts are called upon to prospectively (*ex ante*) evaluate a regulatory costbenefit analysis, or retrospectively (*ex post*) determine how much compensation to award for environmental damage. This thesis sets out to redress this gap by studying US and Indian court cases involving environmental valuation. In each of these jurisdictions, I analyse and compare prospective and retrospective valuation cases, which legal scholars have traditionally treated as separate spheres of enquiry.

There are two analytical themes which tie the case studies together, and help define the approach I take in this thesis. The first is the framework of *valuation choices*: I characterise environmental valuation as a three-stage decision process: whether to value or not to value, what values to measure, and how to measure them. A key contribution of my thesis, therefore, is to outline, define and systematically apply an analytical framework – that of valuation choices – in a range of cases spanning two jurisdictions and a variety of subject matter, thereby yielding valuable insights and trends with respect to judicial decision-making on environmental valuation issues.

The second integrating theme is the concept of *context-driven valuation*. I argue that in both jurisdictions and in each category of case (prospective and retrospective), courts have implicitly or explicitly been making valuation choices, and furthermore, that those choices have been *context-driven*, that is, impelled by, or justified in light of, context. Drawing on the case studies as well as literature on the judicial role, I argue for a recognition of judges' own unique expertise at making context-driven valuation choices.

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## List of Abbreviations

CAA	Clean Air Act (US)
CBA	cost-benefit analysis
CEC	Central Empowered Committee (India)
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act (US)
CSE	Center for Sustainable Economy
CV	contingent valuation
CVM	contingent valuation method
CWA	Clean Water Act (US)
DOE	Department of Energy (US)
DOI	Department of the Interior (US)
EIS	environmental impact statement
EPA	Environmental Protection Agency (US)
EPCA	Energy Policy and Conservation Act (US)
EU	European Union
F&G	Department of Fish and Game (US)
MoEF	Ministry of Environment and Forests (India)
NEERI	National Environmental Engineering Research Institute (India)
NEPA	National Environmental Policy Act (US)
NGT Act	National Green Tribunal Act (India)
NGT	National Green Tribunal of India
NHTSA	National Highway Traffic Safety Administration (US)
NOAA	National Oceanic and Atmospheric Administration (US)

- NPV net present value
- NRCS Natural Resources Conservation Service (US)
- NRD natural resource damages
- OCS outer continental shelf
- OCSLA Outer Continental Shelf Lands Act (US)
- OECD Organization for Economic Cooperation and Development
- OPA Oil Pollution Act (US)
- SCC Social Cost of Carbon
- UN United Nations
- US United States of America
- WTA willingness-to-accept
- WTP willingness-to-pay

### Chapter 1

### Introduction

What is the usual charge for seeing the clouds shattered by the sun? What is the market price of a tree blue on the sky-line and then blinding white in the sun?<sup>1</sup>

GK Chesterton's questions are purely rhetorical, his point being that such things simply cannot be priced. But courts really do have to confront such questions, and what is more, they have to try and come up with concrete answers.

### 1.1 Environmental valuation in court

Environmental valuation is the exercise of putting a monetary value on natural resources (such as lakes, forests or even whole species or ecosystems), amenities (such as clean air or water) or services (such as climate regulation or pollination).<sup>2</sup> Courts are called upon to carry out environmental valuation in a variety of situations. Valuation may be prospective (for instance, evaluating the costs and benefits of a proposal which will have some environmental impact *ex ante*) as well as retrospective (most commonly, adjudicating environmental damage claims *ex post*).

In both cases, environmental valuation can be more complex, and more controversial, than valuation of goods that are traded on the market. If a car is destroyed through negligence, the market value of the car is often a good guide for determining how much compensation should be paid.<sup>3</sup> But with non-market goods like a beach or a

<sup>&</sup>lt;sup>1</sup> GK Chesterton, 'A Cab Ride across Country' in *Tremendous Trifles* (first published 1909, Cosimo 2007) 76.

<sup>&</sup>lt;sup>2</sup> For a good overview of the theory and practice of environmental valuation, see A Myrick Freeman III, Joseph A Herriges and Catherine L Kling, *The Measurement of Environmental and Resource Values: Theory and Methods* (3rd edn, RFF Press 2014).

<sup>&</sup>lt;sup>3</sup> 'If a second-hand car is destroyed, the owner only gets its value; because he can go into the market and get another second-hand car to replace it. He cannot charge the other party with the cost of replacing it with a new car.' Lord Denning MR in *Harbutt's Plasticine Ltd v Wayne Tank and Pump Co Ltd* [1970] 1 QB 447, 468.

forest, or intangible amenities like air quality, it is less clear how valuation should proceed.

Economists have developed a range of sophisticated methods for estimating the value of natural resources and other so-called non-market goods, so it should come as no surprise that when it comes to environmental valuation, economists – and economic methods of valuation – dominate the discussion. My thesis, however, focuses on legal cases involving environmental valuation, and the role of courts therein.

The cases analysed in the following chapters have one thing in common: they all require courts to engage with environmental valuation. In other ways, they are very different, spanning two jurisdictions (the United States and India) and a range of subject matter (regulatory cost-benefit analysis, forest valuation, assessment of environmental damage). Nevertheless, there are two analytical themes which tie the case studies together, and help define the approach I take in this thesis: the framework of *valuation choices* and the concept of *context-driven valuation*.

### 1.2 Valuation choices

I characterise environmental valuation as a three-stage decision process where each stage – or each decision – can be seen as an opportunity for judicial intervention. There are three fundamental choices (which I call *valuation choices*) that are entailed in any exercise of environmental valuation.

The first choice – which I call **step zero** – is whether to value or not to value. The use of valuation is not necessarily a foregone conclusion. At least some decisions could theoretically be made without employing formal environmental valuation techniques: for instance, formal quantitative cost-benefit analysis could be substituted by an informal qualitative weighing of pros and cons,<sup>4</sup> and a polluter's

<sup>&</sup>lt;sup>4</sup> Amy Sinden, 'Cost-Benefit Analysis, Ben Franklin, and the Supreme Court' (2014) 4 *UC Irvine Law Review* 1175, 1213. US courts have recognised as much; see e.g. *American* 

liability could be determined based not on a valuation of environmental damage but on a percentage of the offending company's annual turnover.<sup>5</sup>

The second choice – which I call the **scope choice** – is what values to measure (that is, the scope of the valuation exercise, including the specific resource or amenity to be valued and which categories of value are relevant). Reflecting the fact that a natural resource may be valuable to individuals in different ways, economists and philosophers recognise different forms of value, two examples being *use value* and *existence value*.<sup>6</sup> Use value may be defined as 'the worth of natural resources to the people who use them',<sup>7</sup> for instance, the benefit derived by tourists from hiking in the Grand Canyon. But an individual may also derive some value simply from knowing that the Grand Canyon exists, although she has no intention or prospect of ever visiting it. This is known as *existence value*, a concept introduced, though not actually coined, by the economist John Krutilla.<sup>8</sup> The decision about what values are relevant can have a bearing on the outcome of valuation, and also on the choice of valuation method.

Having decided what values should count in the valuation process, the *third* fundamental choice – which I call the **methodology choice** – is how to measure those values (that is, which valuation methods to use for measuring the relevant values).<sup>9</sup>

*Mining Congress v Thomas* 772 F 2d 617 (10th Cir 1985) 631 (quoting *American Petroleum Institute v EPA* 540 F 2d 1023 (10th Cir 1976) 1037):

The label 'cost-benefit analysis' encompasses everything from a strict mathematical balancing formula to a less strict standard that merely requires the agency to recognize both the costs and benefits of specific proposed alternatives and consider the differences in choosing an appropriate alternative.

<sup>&</sup>lt;sup>5</sup> Indian courts have in fact adopted this approach in several cases, e.g. *Deepak Nitrite v State of Gujarat* (2004) 6 SCC 402. For a fuller discussion, see Chapter 6, Section 6.5.2.

<sup>&</sup>lt;sup>6</sup> For a more detailed discussion of the different forms of economic value, see Chapter 2, Section 2.2.1.

Frank B Cross, 'Natural Resource Damage Valuation' (1989) 42 Vanderbilt Law Review 269, 281.

<sup>&</sup>lt;sup>8</sup> John V Krutilla, 'Conservation Reconsidered' (1967) 57 American Economic Review 777.

<sup>&</sup>lt;sup>9</sup> For a more detailed discussion of different methods of economic valuation, see Chapter 2, Section 2.3.

For goods which are traded on the market, market prices generally provide a good estimate of economic value. But this condition rarely holds for environmental goods. So for natural resource valuation, economists have developed a range of alternative techniques known as non-market valuation methods, each of which has its own underlying assumptions and limitations.

A key contribution of my thesis, therefore, is to outline, define and systematically apply an analytical framework, that of valuation choices, in a range of cases spanning two jurisdictions and a variety of subject matter – a framework which can, in principle, also be applied to other jurisdictions and areas of law which involve environmental valuation to illuminate the mechanics of the judicial decision-making process.

### 1.3 Context-driven valuation

The second integrating theme in my thesis is the concept of *context-driven valuation* – the idea that context does matter and should matter in how courts make valuation choices. What is the value of a lake? The philosopher might say the question is unanswerable. The judge would probably add that without context, the question is also meaningless. For example, what is the valuation for, and whom does it affect? Are we interested in its value because we want to know how much should reasonably be spent on its upkeep, because a developer wants to drain it and build a block of flats, or because a factory has despoiled it by dumping sludge? And in the latter case, do we want damages to be restorative, deterrent or punitive?

The role of context has gone relatively unnoticed in both economics literature and legal literature on environmental valuation. Economists tend to frame valuation problems in acontextual, mathematical terms,<sup>10</sup> while legal literature on environmental valuation tends to be decidedly context-specific which, paradoxically, also results in a lack of attention to context. Consider two categories of cases where questions of valuation figure prominently: cost-benefit analysis and environmental damage. Traditionally, these have been treated as subjects of two different spheres of

<sup>&</sup>lt;sup>10</sup> For a fuller discussion, see Chapter 7, Section 7.1.

legal scholarship: the former, broadly speaking, has been the province of scholars of administrative law,<sup>11</sup> and the latter of tort law experts.<sup>12</sup> The context of valuation for these two categories is very different, but when either of these is studied in isolation, the context is a given, and therefore taken for granted. A second key contribution of my thesis, therefore, is to illuminate the role of context by studying valuation (as a dependent variable, to borrow a mathematical phrase) in a range of legal contexts.

#### 1.4 Structure

Chapter 2 of this thesis sets out the economic-theoretical framework of environmental valuation, using the second and third valuation choices (categories of value and methods of valuation) as an organising principle. It defines key terms and concepts which are used throughout this thesis (e.g. non-use value and stated preference

<sup>&</sup>lt;sup>11</sup> See e.g. David M Driesen, 'The Societal Cost of Environmental Regulation: Beyond Administrative Cost-Benefit Analysis' (1997) 24(3) *Ecology Law Quarterly* 545; Michael Abramowicz, 'Toward a Jurisprudence of Cost-Benefit Analysis' (2002) 100 *Michigan Law Review* 1708; Frank Ackerman and Lisa Heinzerling, 'Pricing the Priceless: Cost-Benefit Analysis of Environmental Protection' (2002) 150 *University of Pennsylvania Law Review* 1553; Jonathan Cannon, 'Sounds of Silence: Cost-Benefit Canons in *Entergy Corp. v. Riverkeeper, Inc.*' (2010) 2 *Harvard Environmental Law Review* 425; Cass R Sunstein, 'Cost-Benefit Analysis and Arbitrariness Review' (2017) 41 *Harvard Environmental Law Review* 1; Francis Dennig, 'Climate Change and the Re-Evaluation of Cost-Benefit Analysis' (2018) 151(1) *Climatic Change* 43; Jonathan S Masur and Eric A Posner, 'Cost-Benefit Analysis and the Judicial Role' (2018) 85(4) *University of Chicago Law Review* 935.

<sup>&</sup>lt;sup>12</sup> See e.g. Frank B Cross, 'Natural Resource Damage Valuation' (1989) 42 Vanderbilt Law Review 269; Kevin M Ward and John W Duffield, Natural Resource Damages: Law and Economics (Wiley 1992); Brian R Binger, Robert F Copple and Elizabeth Hoffman, 'Use of Contingent Valuation Methodology in Natural Resource Damage Assessments: Legal Fact and Economic Fiction' (1994) 89 Northwestern University Law Review 1029; Philippe Sands and Richard B Stewart, 'Valuation of Environmental Damage - US and International Law Approaches' (1996) 5 Review of European Community & International Environmental Law 290; Peter Wetterstein (ed), Harm to the Environment: The Right to Compensation and the Assessment of Damages (Clarendon Press 1997); Dale B Thompson, 'Valuing the Environment: Courts' Struggles with Natural Resource Damages' (2002) 32 Environmental Law 57; Michael Bowman and Alan Boyle (eds), Environmental Damage in International and Comparative Law: Problems of Definition and Valuation (Oxford University Press 2002); Raymond J Kopp and V Kerry Smith (ed), Valuing Natural Assets: The Economics of Natural Resource Damage Assessment (Routledge 2013); Carol Adaire Jones and Lisa DiPinto, 'The Role of Ecosystem Services in USA Natural Resource Liability Litigation' (2018) 29 Ecosystem Services 333.

methods) while also highlighting certain methodological and philosophical challenges, some of which, as we will see in the following chapters, have influenced courts' attitudes towards valuation.

Chapters 3 to 6 are jurisdiction-wise case studies. Chapters 3 and 4 focus on prospective and retrospective valuation in the United States, while Chapters 5 and 6 do the same for India (my choice of jurisdictions and case studies is explained in Section 1.5 below). Through a close analysis of the case law, and drawing on literature from economics, philosophy and legal theory, I make empirical as well as theoretical contributions to the literature on environmental valuation in the courtroom, and on the use of economic theory in courts more generally.

The empirical contribution consists of an in-depth analysis of four important categories of environmental valuation case law spanning two jurisdictions. As the literature reviews in the case-study chapters demonstrate, much of the existing literature in those areas either discusses the issues in the abstract, or focuses on individual cases. Analysing a large body of cases from each jurisdiction makes it possible to identify patterns and trends within that jurisdiction.

From a theoretical standpoint, Chapter 7 ties the four preceding case-study chapters together by showing that in each jurisdiction (the US and India), and in each category of case (prospective and retrospective), courts have implicitly or explicitly been making *valuation choices*, and furthermore, that those choices have been *context-driven*, that is, impelled by, or justified in light of, context. Chapter 8 explores what these conclusions imply for the role of judges, and how judges and experts can and do play mutually complementary roles in environmental valuation.

### 1.5 Choice of jurisdictions

The judicial decisions analysed in this thesis, in particular in the case studies in Chapters 3 to 6, are drawn from the United States (Chapters 3 and 4) and India (Chapters 5 and 6). While the joint treatment of prospective and retrospective valuation in the same scholarly work is unusual (as noted above and further elaborated in Chapter 7), the focus on multiple jurisdictions is not; edited volumes by Bowman and Boyle<sup>13</sup> and Wetterstein<sup>14</sup> both focus on a far wider variety of jurisdictions. Indeed, the analytical themes outlined above – valuation choices and context-driven valuation – can in principle be applied to any body of case law involving environmental valuation, and even to case law involving economic valuation more generally which is beyond the scope of this thesis.

I chose to focus on the US and India because they share certain similarities – they are both common law jurisdictions, and both have a substantial body of case law on environmental valuation which enables a large enough sample size to draw meaningful conclusions.

On the other hand, socially, economically and politically, India and the US obviously differ in very significant ways, although it could be argued that these variances, if anything, serve to illustrate the crucial role of *context* in judicial valuation, which is one of the unifying themes of this thesis. However, this thesis is not, nor does it aspire to be, a true comparative analysis. As John Bell notes, '[t]he very activity of looking at more than one legal system raises questions about the justifiability of differences',<sup>15</sup> but the approach I take in this thesis is simply to develop and apply a set of analytical tools – valuation choices and context-driven valuation – to environmental valuation case law from two different jurisdictions. I remain wary of Levmore's warning that 'being a bad comparativist is easy because the semiliterate observer might miss the importance of culture or of other coordinate rules'.<sup>16</sup>

When it comes to environment and economics, the two jurisdictions are also interesting – one might even say unique – though in two different ways. India, with

<sup>&</sup>lt;sup>13</sup> Bowman and Boyle (n 12).

<sup>&</sup>lt;sup>14</sup> Wetterstein (n 12).

<sup>&</sup>lt;sup>15</sup> John Bell, 'Legal Research and the Distinctiveness of Comparative Law' in Mark Van Hoecke (ed), *Methodologies of Legal Research: Which Kind of Method for What Kind of Discipline?* (Hart Publishing 2011) 158.

<sup>&</sup>lt;sup>16</sup> Saul Levmore, 'Judges and Economics: Normative, Positive, and Experimental Perspectives' (1997) 21 *Harvard Journal of Law & Public Policy* 129, 130.

its specialised environmental courts<sup>17</sup> and its Supreme Court which has been described as 'by far the most activist court in the Third World in the field of environmental protection',<sup>18</sup> is a fascinating case study in environmental adjudication. Chapters 5 and 6 offer multiple examples of the innovative, even adventurous steps taken by the Indian Supreme Court in developing and advancing its environmental jurisprudence.

The US, on the other hand, is interesting for having a particularly sophisticated culture of law and economics,<sup>19</sup> which translates to sophistication in the application of economic valuation methods to environmental cases. Indeed, its legal regime for estimating environmental values is regarded as an exemplar in the field,<sup>20</sup> though its heavy reliance on economic theory has attracted its fair share of critics.<sup>21</sup>

<sup>&</sup>lt;sup>17</sup> See Gitanjali Nain Gill, 'The National Green Tribunal of India: A Sustainable Future through the Principles of International Environmental Law' (2014) 16(3) *Environmental Law Review* 183; Gitanjali Nain Gill, *Environmental Justice in India: The National Green Tribunal* (Routledge 2017).

<sup>&</sup>lt;sup>18</sup> Kaniye SA Ebeku, 'Judicial Contributions to Sustainable Development in Developing Countries: An Overview' (2003) 15(3) *Environmental Law and Management* 168, 173. On activism in India generally, see PN Bhagwati, 'Judicial Activism and Public Interest Litigation' (1984) 23(3) *Columbia Journal of Transnational Law* 561; Jamie Cassels, 'Judicial Activism and Public Interest Litigation in India: Attempting the Impossible?' (1989) 37(3) *American Journal of Comparative Law* 495; SP Sathe, *Judicial Activism in India: Transgressing Borders and Enforcing Limits* (Oxford University Press 2003)

<sup>&</sup>lt;sup>19</sup> See generally Richard A Posner, 'The Law and Economics Movement' (1987) 77(2) *American Economic Review* 1; R H Coase, 'Law and Economics at Chicago' (1993) 36 *Journal of Law and Economics* 239.

See for example Wetterstein's suggestion that 'To some extent the advances made in this field in the US may serve as an example for development elsewhere'. Peter Wetterstein, 'A Proprietary or Possessory Interest: A *Conditio Sine Qua Non* for Claiming Damage for Environmental Impairment' in Wetterstein (n 10) 7. Swanson and Konteleon also draw on the US experience with using valuation methods in courts in order to provide suggestions for the future development of the EU environmental liability regime. Timothy Swanson and Andreas Kontoleon, 'What is the Role of Environmental Valuation in the Courtroom? The US experience and the Proposed EU Directive' (2003) <<u>http://www.elaw.org/resources/text.asp?id=2039</u>> accessed 18 October 2015.

<sup>&</sup>lt;sup>21</sup> US courts have been criticised for imputing to 'economic paradigms – principally the market paradigm – a level of objectivity which simply does not exist'. Ronald G Cummings, 'Legal and Administrative Uses of Economic Paradigms: A Critique' (1991)

For these four case-study chapters, I do not attempt to encompass *all* retrospective and prospective valuation cases within each jurisdiction. Instead, I focus respectively on judicial review of regulatory cost-benefit analysis and contingent valuation of environmental damage (in the US), and forest valuation and damage quantification under the Polluter Pays Principle (in India). The trade-off, as always, is between selecting a sample of case law large enough to be representative and small enough to allow a thorough analysis (the case-selection criteria for each chapter are further detailed in the respective methodology sections).

### **1.6** Retrospective and prospective: a caveat

One advantage of the prospective/retrospective grouping, used throughout this thesis, is that it allows us to investigate how environmental valuation plays out in two very different contexts – a perspective which, as I argue in Chapter 7,<sup>22</sup> is missing in the existing literature. But it is worth making a caveat about the term 'retrospective valuation'.

In Chapters 4 and 6, I include US and Indian cases involving natural resource damages and environmental liability under the head of 'retrospective valuation'. And indeed, many of these cases do offer classic examples of valuation of past damage, such as *Idaho v Southern Refrigerated Transport, Inc.*<sup>23</sup> in the US (involving a chemical spill in a river), or *Vellore Citizens Welfare Forum v Union of India*<sup>24</sup> in India (involving industrial discharge of untreated effluent). However, some other cases are less straightforward.

<sup>31</sup> *Natural Resources Journal* 463, 464. Likewise, Binger *et al* claim that 'Unfortunately, in the frenzy of litigation pressure, these often unrefined or experimental [nonmarket] valuation methods have been pushed beyond their methodological parameters'. Brian R Binger, Robert F Copple and Elizabeth Hoffman, 'Use of Contingent Valuation Methodology in Natural Resource Damage Assessments: Legal Fact and Economic Fiction' (1994) 89 *Northwestern University Law Review* 1029, 1031.

<sup>&</sup>lt;sup>22</sup> See Section 7.1.

<sup>&</sup>lt;sup>23</sup> 1991 US Dist LEXIS 1869 (D Idaho). See Chapter 4.

<sup>&</sup>lt;sup>24</sup> AIR 1996 SC 2715. See Chapter 6.

One such set of cases comprises what I describe in Chapter 4 as 'general challenges' – cases involving a challenge to damage assessment *rules* (as opposed to cases of *actual* damage to natural resources which such rules are intended to address, which of course fall squarely in the 'retrospective valuation' category). Judicial decisions in cases involving 'general challenges' are effectively rulings about *how retrospective valuation will be carried out in the future,* and in that sense, they have a prospective element.

More generally, in any legal system where the doctrine of precedent applies, all cases involving retrospective valuation potentially have some prospective effect.<sup>25</sup> Previous judgments can influence future decisions with respect to the types of environmental damage that are deemed to be compensable, the methods which are used to measure them, as well as with respect to the damage award itself.<sup>26</sup>

### 1.7 A short note on significance

At a practical level, this investigation matters because environmental valuation cases can involve high stakes.<sup>27</sup> If the damage from an oil spill is under-valued, the award may have an insufficient deterrent effect and increase the chances of a similar accident in the future. Over-valuation of a forest may thwart the construction of a railway line which would have brought great social and economic benefits.

<sup>&</sup>lt;sup>25</sup> To generalise even further:

Even in the absence of any formalized doctrine of stare decisis or res judicata, an adjudicative determination will normally enter in some degree into the litigants' future relations and into the future relations of other parties who see themselves as possible litigants before the same tribunal.

Lon L Fuller and Kenneth I Winston, 'The Forms and Limits of Adjudication' (1978) 92(2) *Harvard Law Review* 353, 357.

<sup>&</sup>lt;sup>26</sup> See e.g. Neil MacCormick, 'The Significance of Precedent' 1988 Acta Juridica 174, 177, noting that old precedents are relevant to future compensation awards, which 'must be quantified through some reasonable attempt to express in monetary terms the value of the compensatable harm actually suffered by the plaintiff'.

<sup>&</sup>lt;sup>27</sup> For instance, the damages award in the famous *Exxon Valdez* case was US\$500 million. *Exxon Shipping Co. v Baker* 554 US 471 (2008).

The phrases 'over-valuation' and 'under-valuation' may suggest there is such a thing as a 'correct' valuation. In this thesis I do not presume to make normative claims about what constitutes a 'correct' valuation (if such a thing even exists). My focus is not on *outcome* but on *process*. Process is important because it has a bearing on the outcome, and on the perceived legitimacy of the outcome. As Kahn puts it, 'people are interested not only in the outcomes of environmental policy ... but also in the process by which the policies and outcomes are generated.'<sup>28</sup>

At a more general level, the significance of the study extends beyond the realm of environmental law. There is a lively and long-standing debate about the role of economics and economists in the courtroom<sup>29</sup> and about the limits of market reasoning.<sup>30</sup> The debate, if anything, has grown in prominence in the wake of the global financial crisis,<sup>31</sup> and the role of neoliberal economics in exacerbating the climate crisis.<sup>32</sup> My research seeks to contribute to this debate by examining cases

<sup>&</sup>lt;sup>28</sup> James R Kahn, *The Economic Approach to Environmental and Natural Resources* (2nd edn, Dryden Press 1998) 124.

<sup>&</sup>lt;sup>29</sup> See e.g. Richard A Posner, 'Some Uses and Abuses of Economics in Law' (1979) 46 University of Chicago Law Review 281; Robert H Bork, 'The Role of the Courts in Applying Economics' (1985) 54 Antitrust Law Journal 21; Jonathan R Macey, 'The Pervasive Influence of Economic Analysis on Legal Decisionmaking' (1994) 17 Harvard Journal of Law & Public Policy 107.

<sup>&</sup>lt;sup>30</sup> Neil Duxbury, 'Law, Markets and Valuation' (1995) 61 Brooklyn Law Review 657.

<sup>&</sup>lt;sup>31</sup> See e.g. Jeffrey B Golden, 'The Courts, the Financial Crisis and Systemic Risk' (2009) 4 suppl 1 *Capital Markets Law Journal* S141; Thomas Brennan, Lee Epstein and Nancy Staudt, 'Economic Trends and Judicial Outcomes: A Macrotheory of the Court' (2009) 58 *Duke Law Journal* 1191.

<sup>&</sup>lt;sup>32</sup> See e.g. Avi Brisman, 'Not a Bedtime Story: Climate Change, Neoliberalism and the Future of the Arctic' (2013) 22 *Michigan State International Law Review* 241; Adrian Parr, *The Wrath of Capital: Neoliberalism and Climate Change Politics* (Columbia University Press 2014); Naomi Klein, *This Changes Everything: Capitalism vs. the Climate* (Simon and Schuster 2014); Jonathan T Park, 'Climate Change and Capitalism' (2015) 14 *Consilience* 189. Perhaps most tellingly, the famous 'hothouse earth' paper states in no uncertain terms that '[t]he present dominant socioeconomic system ... is based on high-carbon economic growth and exploitative resource use'. Will Steffen and others, 'Trajectories of the Earth System in the Anthropocene' (2018) 115(33) *Proceedings of the National Academy of Sciences* 8252, 8526, citing JR McNeill and Peter Engelke, *The Great Acceleration: An Environmental History of the Anthropocene Since* 1945 (Harvard University Press 2016).

involving natural resource valuation so as to ascertain – to paraphrase Oliver Wendell Holmes – what the courts do in fact, and nothing more pretentious.<sup>33</sup>

<sup>&</sup>lt;sup>33</sup> Oliver Wendell Holmes, 'The Path of the Law' (1897) 10 *Harvard Law Review* 457, 461. The original quote is, 'The prophecies of what the courts will do in fact, and nothing more pretentious, are what I mean by the law.'

### Chapter 2

### The Economics and Philosophy of Natural Resource Valuation

### 2.1 Introduction

Environmental valuation in the courtroom generally begins – and sometimes ends – with economic methods of valuation. This does not mean that the economist's role is supreme. Judges frequently intervene in the process, for instance by upholding or rejecting a proposed valuation method.<sup>1</sup> Indeed, the role of judges in the valuation process lies at the heart of this thesis. But before we can fruitfully discuss the role of judges in selecting, modifying or applying valuation methods, we need to understand the valuation process itself.

Assuming the 'step zero' question (whether to value or not to value) is answered in the affirmative, the process of valuation involves two fundamental questions: the valuer must determine (a) what values are relevant for the valuation process, and (b) how to measure or express those values in monetary terms.<sup>2</sup>

Section 2.2 of this chapter discusses some possible answers to the first question. I present two different schemes for classifying environmental value, the first from an economic and the second from a philosophical perspective, and conclude by

<sup>&</sup>lt;sup>1</sup> For instance in *Ohio v United States Department of the Interior* 880 F 2d 432 (1989) ('*Ohio*'), the District of Columbia Circuit Court of Appeals held that while market price may be *one* factor in the valuation of a resource, it should not be the exclusive or even the predominant factor. ibid 462. See Chapters 3 and 4 of this thesis for further examples.

<sup>&</sup>lt;sup>2</sup> Denis Swords, 'Ohio v. United States Department of the Interior: A Contingent Step Forward for Environmentalists' (1991) 51 *Louisiana Law Review* 1347, 1350. The focus in this chapter is on monetisation, but of course monetisation is not the only way to make environmental decisions. One alternative is using nonmonetary preference scales: Thomas H Stevens and others, 'Measuring the Existence Value of Wildlife: What Do CVM Estimates Really Show?' (1991) 67 *Land Economics* 390. Another is Sunstein's proposal of 'breakeven analysis': Cass R Sunstein, 'The Limits of Quantification' (2014) 102 *California Law Review* 1369.

emphasising the significance of the choice of relevant values, that is, what kind of values to include in the valuation process.

In Section 2.3, which is devoted to the question of measurement, I explain and analyse some of the more prominent valuation methods developed by economists (market-value-based approaches, revealed preference methods and stated preference methods) with some reference to their use in courtrooms (primarily in the US). I briefly discuss the steps involved as well as some of the underlying assumptions and limitations of the methods. I also touch upon participatory and expert-based methods which have been proposed as alternatives to economic valuation methods.

Finally, economic valuation methods raise not just methodological issues, but also philosophical ones. Indeed, some of the strongest critiques relate to their anthropocentric basis and their assumption of commensurability. These criticisms, and some responses, are discussed in Section 2.4.

### 2.2 Environmental value

### 2.2.1 Environmental value in economics

### (a) Utility and total economic value

In neoclassical economic theory, utility to individuals is taken to be the source of value. Utility itself is of course intangible and unobservable, but it can be measured, at least in principle, by ascertaining how much an individual is willing to pay for a benefit (known as her willingness to pay, or 'WTP') or how much she is willing to accept as compensation for a loss (her willingness to accept, or 'WTA').

The notion of *total economic value* is 'an all-encompassing measure of economic value'<sup>3</sup> of an environmental resource, usually measured by the sum of all relevant WTPs to conserve that resource. Total economic value is generally classified into use and non-use values.

<sup>&</sup>lt;sup>3</sup> David Pearce, Giles Atkinson and Susana Mourato, *Cost-Benefit Analysis and the Environment: Recent Developments* (OECD 2006) 85.

### (b) Use value

The first and most obvious sense in which a natural resource can be valuable to individuals is in terms of its uses. Cross defines *use value* as 'the worth of natural resources to the people who use them.'<sup>4</sup> Such use may be *consumptive* or *non-consumptive*. Some tourists, for instance, visit the Florida Everglades to engage in deer hunting, which is consumptive use because a deer that is shot is a consumed resource. By contrast, birdwatchers in the Everglades also use resources, but in a non-consumptive way.

The value that individuals derive from consumptive or non-consumptive uses such as hunting and birdwatching comes from *direct use* of the Everglades as a resource. In addition, the Everglades provide ecosystem services such as groundwater purification and carbon sequestration;<sup>5</sup> the benefits derived from those services are examples of *indirect use* value.

### (c) Non-use value

Milton Friedman famously proposed that if a national park cannot be maintained by admission fees, it should simply be closed down in the interests of efficiency,<sup>6</sup> and in this, he appears to have conflated use value – or even just direct use value – with total economic value. Shortly afterwards, a much-cited article by Weisbrod<sup>7</sup> challenged Friedman's claim, and in the process paved the way for the recognition of *non-use values* – that is, values which do not derive from actual (direct or indirect) use of a resource – in the economic literature.

 <sup>&</sup>lt;sup>4</sup> Frank B Cross, 'Natural Resource Damage Valuation' (1989) 42 Vanderbilt Law Review 269, 281.

<sup>&</sup>lt;sup>5</sup> Leslie Richardson and others, 'Assessing the Value of the Central Everglades Planning Project (CEPP) in Everglades Restoration: An Ecosystem Service Approach' (2014) 107 *Ecological Economics* 366.

<sup>&</sup>lt;sup>6</sup> Milton Friedman, Capitalism and Freedom (University of Chicago Press 1962) 31.

<sup>&</sup>lt;sup>7</sup> Burton A Weisbrod, 'Collective-Consumption Services of Individual-Consumption Goods' (1964) 78 Quarterly Journal of Economics 471.

Weisbrod pointed out that there are likely to be individuals who anticipate visiting the park at some time in the future, but who, in fact, will never end up visiting it.<sup>8</sup> He argued that although they never actually use the park:

[n]evertheless, if these consumers behave as 'economic men' they will be willing to pay something for the option to consume the commodity in the future. This 'option value' should influence the decision of whether or not to close the park and turn it to an alternative use.'<sup>9</sup>

Weisbrod thus introduced the notion of *option value* which is regarded as a form of non-use value.<sup>10</sup>

In a seminal article published in 1967, Krutilla extended this idea even further.<sup>11</sup> He argued that '[w]hen the existence of a grand scenic wonder or a unique and fragile ecosystem is involved, its preservation and continued availability are a significant part of the real income of many individuals.'<sup>12</sup> Thus, even individuals who have no intention of ever visiting a natural wonder may place some value on its mere existence or preservation. *Existence value* – a concept introduced, though not actually coined, by Krutilla – is a second type of non-use value, denoting the benefit derived by an individual simply from knowing that a natural resource exists.

An individual may also value a natural resource because she values the opportunity for others to use or enjoy it. This gives rise to a third category of non-use value, known

<sup>&</sup>lt;sup>8</sup> ibid 472.

<sup>&</sup>lt;sup>9</sup> ibid.

<sup>&</sup>lt;sup>10</sup> Jonathan M Harris and Brian Roach, *Environmental and Natural Resource Economics: A Contemporary Approach* (3rd edn, ME Sharpe 2013) 109; A Myrick Freeman III, 'Nonuse Values in Natural Resource Damage Assessment' in Raymond J Kopp and V Kerry Smith (ed), *Valuing Natural Assets: The Economics of Natural Resource Damage Assessment* (Routledge 2013) 267. See however n 16 below and accompanying text.

<sup>&</sup>lt;sup>11</sup> John V Krutilla, 'Conservation Reconsidered' (1967) 57 American Economic Review 777.

<sup>&</sup>lt;sup>12</sup> ibid 779.

as *altruistic value*. A specific instance of altruistic value is *bequest value*, the value placed by an individual on a resource being available for future generations.<sup>13</sup>

To return to our earlier example, an individual may place some value on the option to visit the Everglades when she retires (option value). Alternatively, even though she never intends to visit the Everglades, she may derive some satisfaction simply from knowing that they exist (existence value), or from the fact that others can enjoy them (altruistic value). All of these are examples of the non-use value of the Everglades. Total economic value, then, is simply the sum of the use and non-use values of a natural resource.

### (d) A classification of economic value

The categories of total economic value discussed above are represented in tabular form in Fig. 2-1 below.



Fig. 2-1: Classification of economic value<sup>14</sup>

These categories should not be seen as being mutually exclusive; an individual may place a high existence value on the Everglades, and also enjoy direct use value as a visitor.

<sup>&</sup>lt;sup>13</sup> Krutilla himself recognised the bequest motivation. See Krutilla (n 11) 781 fn 11. See however n 17 below and accompanying text.

<sup>&</sup>lt;sup>14</sup> Adapted from Harris and Roach (n 10) 110.

It should also be noted that while the classification presented above finds some support in the literature<sup>15</sup> and is followed in the remainder of this thesis, it is not universal. Pearce *et al*, for instance, regard option value as a form of use (rather than non-use) value,<sup>16</sup> McConnell argues that existence value 'occurs only insofar as bequest or altruistic notions prevail' and should therefore not constitute a separate category in its own right,<sup>17</sup> and Kahn uses 'indirect use value' as just another term for 'non-use value'.<sup>18</sup> However, these differences appear to be mostly semantic rather than conceptual. Definitions of forms of value 'can be considered in part a matter of taste'<sup>19</sup> and for my purposes, the consistent use of terminology is more important than choosing between different sets of (equally valid) definitions.

### 2.2.2 Environmental value in philosophy

In the foregoing discussion, following neoclassical economic theory, the different forms of value were classified on the basis of their impact on the utility of individuals. In philosophy and environmental ethics, on the other hand, a distinction is often drawn between the instrumental, inherent and intrinsic value of natural resources.

Objects are said to have *instrumental value* 'insofar as they are a means to some other end.'<sup>20</sup> The Everglades for example, have instrumental value to the state of Florida as a major source of tourism revenue. By contrast, *inherent value* 'represents the worth that an entity possesses on account of being prized for itself, i.e. for its very existence,

<sup>&</sup>lt;sup>15</sup> ibid. See also John Asafu-Adjaye, *Environmental Economics for Non-Economists: Techniques and Policies for Sustainable Development* (World Scientific 2005) 110.

<sup>&</sup>lt;sup>16</sup> Pearce *et al* (n 3) 86.

<sup>&</sup>lt;sup>17</sup> Kenneth E McConnell, 'Existence and Bequest Value' in Robert D Rowe and Lauraine G Chestnut (eds), *Managing Air Quality and Scenic Resources at National Parks* (Westview Press 1983) 258.

<sup>&</sup>lt;sup>18</sup> James R Kahn, The Economic Approach to Environmental and Natural Resources (Dryden Press 1998) 91.

<sup>&</sup>lt;sup>19</sup> Freeman (n 10) 269.

<sup>&</sup>lt;sup>20</sup> John O'Neill, Alan Holland and Andrew Light, *Environmental Values* (Routledge 2008) 114.

rather than its utility';<sup>21</sup> a nature-lover may value the Everglades for their own sake, and not just as a means to some further ends. Finally, an object is said to have *intrinsic value* if it may be regarded as being valuable independently of the existence of an external valuer.<sup>22</sup> Instrumental and inherent value presuppose an external valuer. But if the Everglades are taken to have intrinsic value, the implication is that they are valuable regardless of whether humans appreciate them or even know about their existence. Indeed, they would be valuable even if humans did not exist.

Two additional points are worth noting here. First, we should resist the temptation to think of 'intrinsic' as *necessarily* being synonymous with 'more important', and instrumental value as 'merely instrumental'; the difference is one of type, not of degree.<sup>23</sup> Willott and Schmidtz use the example of a souvenir postcard (which has small intrinsic value) and a kidney transplant (which is of great instrumental value).<sup>24</sup>

Second (as with the different categories of total economic value), instrumental, inherent and intrinsic value are not mutually exclusive. A painting, the paradigmatic

<sup>&</sup>lt;sup>21</sup> Michael Bowman, 'Biodiversity, Intrinsic Value, and the Definition and Valuation of Environmental Harm' in Michael Bowman and Alan Boyle (eds), *Environmental Damage in International and Comparative Law: Problems of Definition and Valuation* (Oxford University Press 2002) 43.

<sup>&</sup>lt;sup>22</sup> In this trichotomous classification, I have followed writers such as Bowman (ibid); J Baird Callicott, *In Defense of the Land Ethic: Essays in Environmental Philosophy* (State University of New York Press 1989) 161–62; and Robin Attfield, *The Ethics of Environmental Concern* (University of Georgia Press 1991). However, some philosophers use the term 'intrinsic value' to encompass both inherent and intrinsic value (as those terms are defined here), while Taylor uses 'inherent value' to mean intrinsic value (as defined here) and vice versa. Paul W Taylor, *Respect for Nature: A Theory of Environmental Ethics* (Princeton University Press 1986). For an altogether different scheme of classification (commodity value, amenity value and moral value), see Bryan Norton, 'Commodity, Amenity, and Morality: The Limits of Quantification in Valuing Biodiversity' in EO Wilson (ed), *Biodiversity* (National Academy Press 1988).

<sup>&</sup>lt;sup>23</sup> Elizabeth Willott and David Schmidtz, 'Why Environmental Ethics?' in David Schmidtz and Elizabeth Willott (eds), *Environmental Ethics: What Really Matters, What Really Works* (Oxford University Press 2002) xiv.

<sup>&</sup>lt;sup>24</sup> ibid.

example of an object with inherent value,<sup>25</sup> may also have instrumental value for the auctioneer. However, there may sometimes be an inverse relationship. Sagoff gives the example of whales which used to be hunted for oil. Now that we have cheaper substitutes for whale-oil, whales have lost their instrumental value but 'their aesthetic and moral value have become all the more evident.'<sup>26</sup>

The third of these categories, intrinsic value, is particularly controversial. Some philosophers subscribe to the so-called subjectivist view that 'there can be no value apart from an evaluator, that all value is as it were in the eye of the beholder.'<sup>27</sup> On the other hand, Rolston, a prominent proponent of the objectivist viewpoint, holds:

Perhaps there can be no doing science without a scientist, no religion without a believer, no tickle without somebody tickled. But there can be law without a lawgiver, history without a historian; there is biology without biologists, physics without physicists, creativity without creators, story without story-tellers, achievement without achievers – and value without valuers. A sentient valuer is not necessary for value.<sup>28</sup>

Meta-ethical debates about the nature of value may seem abstruse and of questionable practical relevance, but they can spill over into the legal arena in the context of valuation. The term 'intrinsic value' appears in treaties such as the

<sup>&</sup>lt;sup>25</sup> Eugene C Hargrove, 'Weak Anthropocentric Intrinsic Value' (1992) 75 *Monist* 183, 204: 'The idea that art objects are intrinsically valuable is so well established that it was seldom overtly expressed. It appears primarily in analogies extending intrinsic value from art to nature and in contrasts of intrinsic value with instrumental and utilitarian value.'

<sup>&</sup>lt;sup>26</sup> Mark Sagoff, *Price, Principle, and the Environment* (Cambridge University Press 2004) 17.

<sup>&</sup>lt;sup>27</sup> J Baird Callicott, 'Animal Liberation: A Triangular Affair' (1980) 2 Environmental Ethics 311, 325. This position is echoed by Bryan G Norton, Toward Unity among Environmentalists (Oxford University Press 1991) 251, and much earlier, in a nonenvironmental context, by Wilhelm Windelband, An Introduction to Philosophy (Joseph McCabe tr, T Fisher Unwin 1921) 215.

<sup>&</sup>lt;sup>28</sup> Holmes Rolston, 'Value in Nature and the Nature of Value' (1994) 36 Royal Institute of Philosophy Supplement 13, 29. Taylor (n 22) is another prominent objectivist thinker.

Biodiversity Convention<sup>29</sup> and the Antarctic-Environmental Protocol,<sup>30</sup> and the debate about its true meaning is essentially a philosophical one. Julio Barboza, Special Rapporteur of the International Law Commission, concluded that 'intrinsic' as used in these legal instruments:

[does] not mean that the adverse effects on the environment per se constitute a form of harm which is independent of human beings. It is difficult to understand who could be harmed by the loss of the ecological or aesthetic values of Antarctica if there were no human beings on the planet to appreciate them.<sup>31</sup>

This is a clear statement of a subjectivist stance, in contrast to Bowman's position that the term 'intrinsic value' in the Biodiversity Convention has been used in the objectivist sense, that is, to mean that biodiversity has a kind of value which does not depend on a sentient valuer.<sup>32</sup>

#### 2.2.3 The choice of relevant values

I began this chapter by noting that before measuring the value of a natural resource, the valuer must first decide what values are relevant for the valuation process. This is a decision that courts have on occasion weighed in on. In *Ohio*, the DC Circuit Court of Appeals held that '[o]ption and existence values may represent "passive" use, but they nonetheless reflect utility derived by humans from a resource and thus, *prima facie*, ought to be included in a damage assessment.'<sup>33</sup>

<sup>&</sup>lt;sup>29</sup> Convention on Biological Diversity (adopted 5 June 1992, entered into force 29 December 1993) 1760 UNTS 79 ('Biodiversity Convention'). The first recital in the Preamble refers to 'the intrinsic value of biological diversity'.

<sup>&</sup>lt;sup>30</sup> Protocol on Environmental Protection to the Antarctic Treaty (adopted 4 October 1991, entered into force 14 January 1998) (1991) 30 ILM 1455 ('Antarctic-Environmental Protocol'). Art 3 refers to 'the intrinsic value of Antarctica, including its wilderness and aesthetic values'.

<sup>&</sup>lt;sup>31</sup> Julio Barboza, 'Eleventh Report on International Liability for Injurious Consequences Arising out of Acts not Prohibited by International Law' UN Doc A/CN.4/468, (1995) II(1) Yearbook of the International Law Commission 51, 56.

<sup>&</sup>lt;sup>32</sup> Bowman (n 21) 47.

<sup>&</sup>lt;sup>33</sup> Ohio (n 1) 464. For a fuller discussion of the Ohio decision, see Chapter 4.

Such decisions are important because the choice as to what values are to be included in the valuation can determine not just the outcome, but also the choice of valuation method. For instance existence values (to pick one category of economic value out of those discussed in Section 2.2.1 above) cannot be measured by the class of valuation methods known as revealed preference methods,<sup>34</sup> so such techniques are clearly unsuitable if non-use values are sought to be measured.

The same applies for the forms of value recognised in the philosophical literature (see Section 2.2.2 above). Instrumental value and arguably even inherent value can, at least in principle, be estimated by carefully chosen economic valuation techniques.<sup>35</sup> Some writers have claimed that the same holds true for intrinsic value, as illustrated by the following passage:

> The quantification of intrinsic value is difficult, but no more so than the calculation of compensation for several of the traditional heads of damage in an ordinary personal injuries claim, such as loss of expectation of life or 'the injury itself', or in a claim for damage to reputation, where no genuine market valuation exists.'<sup>36</sup>

Given that intrinsic value, by Bowman's own definition,<sup>37</sup> is objective in the sense that it does not depend on an external valuer, it is hard to see how it can be reliably quantified by a valuation process which is inherently subjective. Whatever intrinsic value – if any – the Everglades may have, if society as a whole happened not to value them at all, it seems that any attempt by that society's members to quantify the value of the Everglades would arrive at a low figure, perhaps zero.

Economists themselves do not seem optimistic about measuring intrinsic value – and rightly so. Pearce *et al* admit that total economic value does not encompass intrinsic

<sup>&</sup>lt;sup>34</sup> Revealed preference methods are discussed in Section 2.3.2 below.

<sup>&</sup>lt;sup>35</sup> For a contrary view, see Mark Sagoff's argument that economic valuation 'cannot venture much beyond price or value in exchange. Economists have no plausible way to measure – or to adjudicate conflicts that arise between attempts to measure – value in use or benefit.' Sagoff (n 26) 7.

<sup>&</sup>lt;sup>36</sup> Michael Bowman, 'The Definition and Valuation of Environmental Harm: An Overview' in Bowman and Boyle (n 21) 14.

<sup>&</sup>lt;sup>37</sup> Bowman (n 21) 43.

value, while speculating that some people's WTP for conserving a resource may well be influenced by their own judgments about intrinsic value.<sup>38</sup>

In deciding what kinds of value are relevant for a given valuation exercise, it is worth being mindful about the limits of valuation methods, and what values they can realistically measure. Bowman's arguably misplaced optimism about measuring intrinsic value only goes to show the importance of David Schmidtz's warning against 'jumping from economic to philosophical discussions without stopping to remind ourselves that what is taken for granted in one kind of discussion cannot be taken for granted in the other.'<sup>39</sup>

### 2.3 Economic methods of valuation

#### 2.3.1 Market value

For goods which are traded on the market, market prices generally provide a good estimate of economic value.<sup>40</sup> This is not just a proposition of economic theory; it is also recognised in common law. If a car is destroyed through negligence, the market value of the car is regarded as a good guide for determining how much compensation should be paid.<sup>41</sup> The damage for destroying marketable trees on private property has been held to be 'the value of the timber at the time and place where the trees were cut.'<sup>42</sup>

<sup>&</sup>lt;sup>38</sup> Pearce *et al* (n 3) 87–88. This view is echoed by Cross (n 4) 296: 'Enlightened human preference thus may capture at least a portion of intrinsic value, but the preference is predicated necessarily on an informed human understanding of intrinsic value, not on the value itself.'

<sup>&</sup>lt;sup>39</sup> David Schmidtz, 'A Place for Cost-Benefit Analysis' (2001) 11 *Philosophical Issues* 148, 156.

<sup>&</sup>lt;sup>40</sup> Nick Hanley, 'The Economic Value of Environmental Damage' in Bowman and Boyle (n 21) 29–30. For a technical derivation of market value from consumers' WTP and producers' marginal cost, see Kahn (n 18) 88–89.

<sup>&</sup>lt;sup>41</sup> 'If a second-hand car is destroyed, the owner only gets its value; because he can go into the market and get another second-hand car to replace it. He cannot charge the other party with the cost of replacing it with a new car.' *Harbutt's Plasticine Ltd v Wayne Tank and Pump Co Ltd* [1970] 1 QB 447, 468 (Lord Denning MR).

<sup>&</sup>lt;sup>42</sup> Chevron Oil Co. v Snellgrove 253 Miss. 356 (1965) 364. See however Barker v Company 78 N.H. 571 (1918) 574: 'In trespass for cutting and carrying away shade trees, the owner is not limited to their value for lumber. ... He recovers what their aesthetic value was.'

The popularity of market value stems from the fact that it is relatively easy to measure, and it relies on actual behaviour, unlike say stated preference methods (see Section 2.3.3 below) which rely on hypothetical choices.

However, for *environmental* valuation – the subject of this thesis – market price often proves to be highly inadequate. The price of a good is simply its exchange value relative to a reference currency, and a good can have exchange value only if it is scarce.<sup>43</sup> If a good is non-scarce, that is, if it is freely and abundantly available, there is no incentive to give something up to obtain it.<sup>44</sup> Clean air is the classic example of a non-scarce good (although that may soon change).<sup>45</sup>

Secondly, some environmental goods, like coral reefs, though scarce, are not traded on the market, and for such things the concept of market price has no meaning (although coral reefs, like clean air, clearly do have economic value in that they provide utility to individuals).

Thirdly, market prices generally reflect a narrow range of values, and fail to capture non-use value altogether. The *Ohio* court illustrated the implications with a poignant example:

[I]magine a hazardous substance spill that kills a rookery of fur seals and destroys a habitat for seabirds at a sealife reserve. The lost use value of the seals and seabird habitat would be measured by the market value of the fur seals' pelts (which would be approximately

<sup>&</sup>lt;sup>43</sup> Herman E Daly, 'The Return of Lauderdale's Paradox' (1998) 25 *Ecological Economics* 21, 22.

<sup>&</sup>lt;sup>44</sup> The so-called 'paradox of value' was recognised as far back as the ancient Greeks: 'For only what is rare is valuable; and "water," which, as Pindar says, is the "best of all things," is also the cheapest.' Plato, *The Dialogues of Plato* vol 1 (tr Benjamin Jowett, 3rd edn, Oxford University Press 1892) 245.

<sup>&</sup>lt;sup>45</sup> 'Jar of French Mountain Air Sells for £512 in Polluted Beijing' *The Guardian* (London, 10 April 2014) <<u>http://www.theguardian.com/environment/2014/apr/10/jar-french-mountain-air-polluted-beijing</u>> accessed 10 May 2016.

\$15 each) plus the selling price per acre of land comparable in value to that on which the spoiled bird habitat was located.<sup>46</sup>

### 2.3.2 *Revealed preference methods*

Given the serious limitations of market price for valuing goods which are not traded on the market, economists have developed a range of alternative techniques known as *non-market valuation methods*. The usual way to classify these techniques is on the basis of the source of the data.<sup>47</sup>

The two major classes of non-market valuation methods are *revealed preference methods* and *stated preference methods*. One feature common to all revealed preference methods is that they seek to infer the value which individuals place on a non-market good, based on their observed behaviour in *real* markets for related goods. This is generally regarded as their greatest strength, whereas stated preference methods rely on questions and surveys regarding *hypothetical* markets and choices. On the other hand, revealed preference methods can only measure use values, while stated preference methods can measure both use and non-use values.<sup>48</sup>

<sup>&</sup>lt;sup>46</sup> Ohio (n 1) 442 (footnotes omitted). See however Julio Barboza, 'The ILC and Environmental Damage' in Wetterstein (ed), *Harm to the Environment: The Right to Compensation and the Assessment of Damages* (Clarendon Press 1997) 79: 'Whenever there is a market price for the damaged components, that price would give a good measure of the damage.'

<sup>&</sup>lt;sup>47</sup> A Myrick Freeman, *The Measurement of Environmental and Resource Values: Theory and Methods* (2nd edn, Resources for the Future 2003) 23.

<sup>&</sup>lt;sup>48</sup> In fact, Freeman argues that as a practical matter, it may be best to *define* non-use value as the value that cannot be estimated using revealed preference techniques. ibid 152.
The *travel cost method* and *hedonic pricing*, briefly described below, are the two most common revealed preference methods.<sup>49</sup> Other popular techniques include avertive behaviour and cost of illness methods.<sup>50</sup>

#### (a) Travel cost method

The travel cost method is probably the oldest of the non-market valuation techniques, first proposed in a letter by Harold Hotelling in 1947.<sup>51</sup> It is commonly used to estimate the use value to visitors of sites such as national parks and beaches. The basic premise behind the method is that visitors need to incur some expenditure in order to travel to the site and participate in recreational activities. Assuming the visitor is rational, her WTP for the trip (see Section 2.2.1 above) must be equal to or greater than the expenditure incurred. Her expenditure therefore furnishes a lower bound for her WTP which in turn is a measure of her expected utility from the trip.

As an example, let us say a researcher wants to find the recreational value of the Everglades. One way to do this is to collect data about visitors to the site. Let us say Person A lives 20 km away and has visited the site five times in the previous year, while Person B lives 100 km away and has visited only once in that period. Their travel cost, that is, the total cost incurred by each of them to visit the site, will include costs such as the site admission fee, the cost of driving to the site (petrol and other expenses), and the opportunity cost of travel time (a crude way to estimate this is by multiplying an individual's hourly wage by the number of hours it takes her to travel to the site). Let us say the travel costs for A and B are found to be \$30 and \$120 respectively. By doing this exercise for a sufficiently large sample size of visitors, the researcher can construct a demand curve showing the relationship between travel

<sup>&</sup>lt;sup>49</sup> Bradley J Butterfield and others, 'Tradeoffs and Compatibilities among Ecosystem Services: Biological, Physical and Economic Drivers of Multifunctionality' in Guy Woodward and David A Bohan (eds), *Ecosystem Services: From Biodiversity to Society*, part 2 (Elsevier 2016) 234. A more detailed treatment of the hedonic pricing and travel cost methods appears in Nick Hanley and Clive L Spash, *Cost-Benefit Analysis and the Environment* (Edward Elgar 1993) chapters 4 and 5.

<sup>&</sup>lt;sup>50</sup> For a good account of these techniques, and revealed preference methods in general, see Pearce *et al* (n 3) 98–102.

<sup>&</sup>lt;sup>51</sup> Hanley and Spash (n 49) 83.

cost and number of visits (the demand curve will be downward-sloping because individuals who face higher travel costs will presumably make fewer visits). The area under the demand curve provides an estimate of the total economic benefit to visitors from the recreational use of the site.

One limitation of the travel cost method is that, besides being unable to estimate nonuse value, it also cannot measure use value from activities which do not require travelling to the site. An individual may derive utility from watching a television documentary about the Everglades,<sup>52</sup> but such value cannot be measured by the travel cost method. Nor can it measure the indirect use value which the Everglades may provide to local residents in the form of, say, water purification.

Then there are methodological issues, which include how to account for factors such as travel-time costs (hourly wage, used in the example above, is at best an approximate guide), multiple-purpose trips (a person may have come to the Everglades as a mere side trip, their main purpose being to visit relatives in Florida) and substitute sites (regardless of travel cost, a visitor is likely to visit a given site fewer times a year if she has many similar sites within easy reach).

Despite these shortcomings, travel cost methods have been used to estimate values for a wide range of sites and activities, including for Achray Forest in Scotland<sup>53</sup> and deer hunting in the US.<sup>54</sup> They have also been used in the courtroom, a prominent example being the *American Trader* case.<sup>55</sup>

<sup>&</sup>lt;sup>52</sup> Randall and Stoll call this 'vicarious consumption'. Alan Randall and John R Stoll, 'Existence Value in a Total Valuation Framework' in Rowe and Chestnut (n 17) 267.

<sup>&</sup>lt;sup>53</sup> Nick Hanley, 'Valuing Rural Recreational Benefits: An Empirical Comparison of Two Approaches' (1989) 40 *Journal of Agricultural Economics* 361.

<sup>&</sup>lt;sup>54</sup> Erol Balkan and James R Kahn, 'The Value of Changes in Deer Hunting Quality: A Travel Cost Approach' (1988) 20 Applied Economics 533.

<sup>&</sup>lt;sup>55</sup> People of the State of California ex rel. Department of Fish and Game v BP America, Inc. Orange County Superior Court Case Number 64 63 39 (1997) ('American Trader'). A good account of the trial, written by the testifying experts for the plaintiffs, appears in David J Chapman and W Michael Hanemann, 'Environmental Damages in Court: The American Trader Case' in Anthony Heyes (ed), The Law and Economics of the Environment (Edward

On 7 February 1990, the steam tanker *American Trader* spilled over 400,000 gallons of crude oil off the coast of California, forcing the temporary closure of approximately 14 miles of beaches. The resulting damage claim focused on lost recreational value resulting from the beach closures. To quantify this value, the plaintiffs' team of economists relied on a previous travel cost study of beach visitors in Florida. The authors of that study calculated an estimated consumer surplus of \$10.23 per person per day from a trip to the beach. The defendants on the other hand cited a contingent valuation study (see Section 2.3.3 below) which, not surprisingly, suggested a much lower figure. Eventually the jury appeared to side more with the plaintiffs' estimates rather than the defendants', awarding \$12.75 million in lost recreational values (in addition to the awards for civil liability and costs).<sup>56</sup>

# (b) Hedonic pricing

The hedonic pricing method is based on Lancaster's characteristics theory of value,<sup>57</sup> according to which consumers value a good not for itself, but because of the characteristics which that good possesses. For example, the buyer of a house may value characteristics such as the number of bedrooms, proximity to the train station, and the levels of air quality and noise pollution in the neighbourhood.

To see how the hedonic pricing method works, let us say two houses are identical in all respects, except that the air quality around the first house is better. Now if the first house sells at a higher price, this provides some evidence of how much value people place on clean air.

Of course, in practice, no two houses are completely identical, but with data on a large number of house prices, the researcher can use statistical methods to isolate the attribute whose value is to be measured and then study what effect, if any, it has on

Elgar Publishing 2001). For the defendants' perspective, see Richard W Dunford, 'The *American Trader* Oil Spill: An Alternative View of Recreation Use Damages' (1999) 19(1) *Association of Environmental and Resource Economists Newsletter* 12.

<sup>&</sup>lt;sup>56</sup> ibid.

<sup>&</sup>lt;sup>57</sup> Kelvin J Lancaster, 'A New Approach to Consumer Theory' (1966) Journal of Political Economy 132.

house prices. Thus, hedonic pricing is based on the assumption that 'people's valuation of environmental attributes can be inferred from the amount they are willing to pay for these attributes through the housing market.'<sup>58</sup>

Hedonic pricing is generally applied to the housing market, and has been used to estimate, among other things, the amenity value of woodland in Great Britain<sup>59</sup> and of farmland in Philadelphia.<sup>60</sup> Hedonic pricing studies have also been cited – not always with success – in US court cases about diminution of property values from soil erosion by government-constructed jetties<sup>61</sup> and inundation due to Hurricane Katrina.<sup>62</sup>

As with all revealed preference methods, hedonic pricing cannot be used to measure non-use value. In fact, its application is limited almost exclusively to environmental goods that can be linked to housing prices. Even for such goods, the method tends to undervalue benefits – for instance, it can capture the benefit of clean air to houseowners, but not to visitors in the city. The method also assumes that market participants have good information about relative air quality across different locations and about the benefits of clean air.

<sup>&</sup>lt;sup>58</sup> Nick Hanley, Jason Shogren and Ben White, *Introduction to Environmental Economics* (Oxford University Press 2001) 53–54.

<sup>&</sup>lt;sup>59</sup> Guy Garrod and Ken Willis, 'The Amenity Value of Woodland in Great Britain: A Comparison of Economic Estimates' (1992) 2 *Environmental and Resource Economics* 415.

<sup>&</sup>lt;sup>60</sup> Richard C Ready and Charles W Abdalla, 'The Amenity and Disamenity Impacts of Agriculture: Estimates from a Hedonic Pricing Model' (2005) 87 American Journal of Agricultural Economics 314.

<sup>&</sup>lt;sup>61</sup> Banks v United States 102 Fed Cl 115 (2011).

<sup>&</sup>lt;sup>62</sup> In re Katrina Canal Breaches Consolidated Litigation 2007 U.S. Dist. LEXIS 82887 (ED La).

#### 2.3.3 *Stated preference methods*

#### (a) Contingent valuation

By far the most prominent of the stated preference methods is *contingent valuation*. The method has its theoretical origins in the work of Bowen<sup>63</sup> and Ciriacy-Wantrup<sup>64</sup> who first proposed the use of public opinion surveys to value what we now call nonmarket goods. Robert Davis was the first economist to undertake an empirical contingent valuation survey in his study of outdoor recreation in the woods of Maine.<sup>65</sup> Since then, the technique has seen successive refinements, wider acceptance in legal and policy spheres, and also its fair share of controversy.<sup>66</sup>

Contingent valuation, in its essentials, is very simple. Using carefully-designed questionnaires, survey participants are asked about their maximum WTP for a hypothetical improvement (or for avoiding a hypothetical deterioration) in environmental quality. Alternatively, they may be asked about their minimum WTA as compensation for a hypothetical deterioration. The preference is thus *stated* in response to a question, rather than *revealed* through market behaviour. By surveying a large number of respondents, the mean and median WTP can be calculated, which allows the researcher to estimate what value people place on the environmental change in question.

<sup>&</sup>lt;sup>63</sup> Howard R Bowen, 'The Interpretation of Voting in the Allocation of Economic Resources' (1943) 58 Quarterly Journal of Economics 27.

 <sup>&</sup>lt;sup>64</sup> Siegfried V Ciriacy-Wantrup, 'Capital Returns from Soil-Conservation Practices' (1947)
29 Journal of Farm Economics 29.

<sup>&</sup>lt;sup>65</sup> Robert K Davis, 'The Value of Outdoor Recreation: An Economic Study of the Maine Woods' (Dissertation, Harvard University 1963).

<sup>&</sup>lt;sup>66</sup> For a more detailed historical account, see Richard T Carson and W Michael Hanemann, 'Contingent Valuation' in Karl-Goran Mäler and Jeffrey R Vincent (eds), *Handbook of Environmental Economics* vol 2 (Elsevier 2003) 827–43; Richard T Carson, *Contingent Valuation: A Comprehensive Bibliography and History* (Elgar 2011).

Contingent valuation has been used to estimate the value of everything from grey whales<sup>67</sup> to desert lands.<sup>68</sup> In the legal arena, the DC Circuit Court of Appeals decision in *Ohio*,<sup>69</sup> which endorsed contingent valuation as a theoretically valid valuation method, has been widely debated by lawyers and economists alike.<sup>70</sup>

There are several reasons why contingent valuation is so controversial. Because it relies on hypothetical choices and does not require respondents to 'put their money where their mouth is', there is no guarantee that respondents are not understating or overstating their bids. The choice of WTP or WTA can also affect the outcome, since respondents' WTP to prevent a loss (such as the extinction of a rare bird) is typically lower than their WTA, especially for environmental goods.<sup>71</sup> Responses can also be influenced by factors like the design of the questionnaire and the way information is presented. Thus a major challenge is 'to make the scenario sufficiently understandable, plausible and meaningful to respondents so that they can and will give valid and reliable values'.<sup>72</sup> In spite of these limitations, contingent valuation is widely used because it can be used to estimate non-use values which market value or revealed preference methods do not capture.

# *(b) Other stated preference methods*

Other stated preference methods include *choice experiments* and *contingent ranking*.<sup>73</sup> In both these methods, respondents are presented with a series of alternatives. Let us

<sup>&</sup>lt;sup>67</sup> John B Loomis and Douglas M Larson, 'Total Economic Values of Increasing Gray Whale Populations: Results from a Contingent Valuation Survey of Visitors and Households' (1994) 9 Marine Resource Economics 275.

<sup>&</sup>lt;sup>68</sup> Jerrell Richer, 'Willingness to Pay for Desert Protection' (1995) 13(4) Contemporary Economic Policy 93.

<sup>&</sup>lt;sup>69</sup> *Ohio* (n 1).

<sup>&</sup>lt;sup>70</sup> For an overview of this literature, see Chapter 4, Section 4.2.

<sup>&</sup>lt;sup>71</sup> W Michael Hanemann, 'Willingness to Pay and Willingness to Accept: How Much Can They Differ?' (1991) 81 American Economic Review 635.

<sup>&</sup>lt;sup>72</sup> Robert Cameron Mitchell and Richard T Carson, Using Surveys to Value Public Goods: The Contingent Valuation Method (Resources for the Future 1989) 120.

<sup>&</sup>lt;sup>73</sup> I have devoted more space to contingent valuation because it is still the predominant stated preference method, but choice experiments and contingent ranking are gaining in popularity. For a fuller account of these methods, see Pearce *et al* (n 3) chapter 9.

say a researcher wants to ascertain what value visitors to the Everglades place on removal of litter. A (simplified) questionnaire for the purpose might be as follows:

Status quo:	Entry fees are \$10; 90% of litter is removed.
Option A:	Entry fees are \$13; 95% of litter is removed.
Option B:	Entry fees are \$20; 100% of litter is removed.

In the choice experiment approach, respondents are asked to select their most preferred alternative, while in contingent ranking, they are asked to rank the options in order of preference. Thus, like contingent valuation, these methods are based on hypothetical scenarios. But they differ in that respondents are not asked to state a dollar value; instead, the researcher seeks to infer values from the choices which respondents make.

# 2.3.4 Alternative approaches

As a response to some of the criticisms of revealed and stated preference methods, particularly those pertaining to the strong reliance on individual preferences,<sup>74</sup> alternative approaches to environmental decision-making have been proposed. These include participatory approaches such as *values juries* where a group of randomly selected citizens are given good information and asked to recommend a course of action or a monetary amount,<sup>75</sup> and *valuation workshops* with citizens involving successive rounds of contingent valuation, discussion and recommendations.<sup>76</sup>

<sup>&</sup>lt;sup>74</sup> For a good account of these criticisms and their implications for the acceptance of valuation in the courtroom, see Andreas Konteleon, Richard Macrory and Timothy Swanson, 'Individual Preference-Based Values and Environmental Decision Making: Should Valuation Have its Day in Court?' (2002) 20 Journal of *Research in Law and Economics* 179.

<sup>&</sup>lt;sup>75</sup> Thomas C Brown, George L Peterson and Bruce E Tonn, 'The Values Jury to Aid Natural Resource Decisions' (1995) 71 *Land Economics* 250.

<sup>&</sup>lt;sup>76</sup> Wendy Kenyon and Nick Hanley, 'Economic and Participatory Approaches to Environmental Evaluation' *Economic Department Discussion Paper 2000–15* (University of Glasgow 2000).

A second approach is to rely on experts rather than lay citizens. In *multi-criteria analysis*, experts or policy-makers assess environmental policies based on specific, weighted criteria,<sup>77</sup> while the *Delphi technique* relies on multiple rounds of interviews with groups of experts.<sup>78</sup> In the legal arena, the reliance on experts may translate to a greater role for judges. Thus, Sands and Stewart suggest that instead of relying on economic methodologies, 'judges or members of an administrative tribunal could use their best judgement to assign a monetary value to environmental impairment on a case-by-case basis.'<sup>79</sup>

#### 2.4 Philosophical questions

So far, in discussing the limitations of valuation methods, I have focused mostly on methodological limitations. But economic valuation methods also raise philosophical questions, at least two of which are important enough to be addressed separately.

#### 2.4.1 Anthropocentricism

The sophist philosopher Protagoras is believed to have said that 'man is the measure of all things',<sup>80</sup> and economists mean much the same thing when they say, more prosaically, that '[a] service flow will have economic value only if it enters at least one individual's utility function or one firm's production function.'<sup>81</sup>

<sup>&</sup>lt;sup>77</sup> Murat Köksalan, Jyrki Wallenius and Stanley Zionts, *Multiple Criteria Decision Making: From Early History to the 21st Century* (2011 World Scientific).

<sup>&</sup>lt;sup>78</sup> A version of this technique has been used for cost-effectiveness analysis of woodland ecosystem restoration. Douglas C Macmillan, David Harley and Ruth Morrison, 'Cost-Effectiveness Analysis of Woodland Ecosystem Restoration' (1998) 27 Ecological Economics 313.

<sup>&</sup>lt;sup>79</sup> Philippe Sands and Richard B Stewart, 'Valuation of Environmental Damage – US and International Law Approaches' (1996) 5 *Review of European Community & International Environmental Law* 290, 294. See also Richard B Stewart, 'Comment on Paper by Andreas Kontoleon, Richard Macrory and Timothy Swanson' in Timothy M Swanson (ed), *An Introduction to the Law and Economics of Environmental Policy: Issues in Institutional Design* (Elsevier Science 2002).

<sup>&</sup>lt;sup>80</sup> Plato (n 44) 205.

<sup>&</sup>lt;sup>81</sup> Hanley and Spash (n 49) 121.

This anthropocentric bias in economic valuation is controversial, but perhaps predictable given that traditional Western ethical theories have largely been anthropocentric. Aristotle, for instance, claimed that 'nature has made all things specifically for the sake of man.'<sup>82</sup> Similarly, Thomas Aquinas believed that 'animals are ordered to man's use in the natural course of things, according to divine providence. Consequently, man uses them without any injustice, either by killing them or by employing them in any other way.'<sup>83</sup> In fact, in a 1967 essay, historian Lynn White argued that the historical roots of the environmental crisis lay in mainstream Judeo-Christian thought, specifically the idea that humans are superior to other forms of life, and entitled to exploit nature for their own ends.<sup>84</sup>

Thus, it is no surprise that when environmental ethics 'emerged as a new subdiscipline of philosophy in the early 1970s, it did so by posing a challenge to traditional anthropocentrism.'<sup>85</sup> A seminal moment in its early development was a startling thought experiment proposed by Richard Sylvan (then Routley), which came to be known as the 'Last Man' argument:

The last man (or person) surviving the collapse of the world system lays about him, eliminating, as far as he can, every living thing, animal or plant (but painlessly if you like, as at the best abattoirs).<sup>86</sup>

Sylvan argued that from a strictly anthropocentric perspective, the last man's actions are not morally wrong, since they do not affect the interests of any other humans (there being none left), 'but on environmental grounds what he does is wrong'.<sup>87</sup>

#### <sup>87</sup> ibid.

<sup>&</sup>lt;sup>82</sup> Aristotle, *The Politics* (T A Sinclair tr, Penguin 1962) 40.

<sup>&</sup>lt;sup>83</sup> Thomas Aquinas, *Summa Contra Gentiles* book 3 (Joseph Kenny ed, Vernon J Bourke tr, Hanover House 1955–57) ch 112.

<sup>&</sup>lt;sup>84</sup> Lynn White, 'The Historical Roots of Our Ecological Crisis' (1967) 155 *Science* 1203.

<sup>&</sup>lt;sup>85</sup> Andrew Brennan and Yeuk-Sze Lo, 'Environmental Ethics' in Edward N Zalta (ed), *The Stanford Encyclopedia of Philosophy* (Winter 2015 Edition) <<u>http://plato.stanford.edu/archives/win2015/entries/ethics-environmental/</u>> accessed 11 February 2016.

<sup>&</sup>lt;sup>86</sup> Richard Routley, 'Is there a Need for a New, an Environmental Ethic?' (1973) 1 Proceedings of the XVth World Congress of Philosophy 205, 207.

The new movement thus challenged traditional anthropocentricism, arguing for an extension of the class of entities which deserve moral consideration. A famous extension of this argument in legal literature – indeed, its logical conclusion – was Christopher Stone's proposal in 1972 to give legal rights 'to forests, oceans, rivers and other so-called "natural objects" in the environment – indeed, to the natural environment as a whole'.<sup>88</sup>

Valuation methods are indeed anthropocentric, but importantly, this does not necessarily mean that nature is regarded as being of 'merely' instrumental value, a resource to be exploited for our benefit. Hargrove argues that '*anthropocentric* is not and has never been a synonym for *instrumental*. It simply means "human-centered," and refers to a human-oriented perspective – seeing from the standpoint of a human being.'<sup>89</sup> On this definition, an anthropocentric outlook does not preclude wholly non-instrumental concerns for other organisms or for nature in general. Callicott expresses the point as follows:

Value may be grounded in human feelings, but neither the feelings themselves nor, necessarily, the breast or self in which they reside are their natural objects. ... Their natural objects are not limited, except by convention, to other human beings.<sup>90</sup>

<sup>&</sup>lt;sup>88</sup> Christopher D Stone, 'Should Trees Have Standing? – Toward Legal Rights for Natural Objects' (1972) 45 Southern California Law Review 450, 456.

<sup>&</sup>lt;sup>89</sup> Hargrove (n 25) 183–84.

<sup>&</sup>lt;sup>90</sup> J Baird Callicott, 'Non-Anthropocentric Value Theory and Environmental Ethics' (1984) 21 American Philosophical Quarterly 299, 305. The distinction between the valuer and the object of value is of importance, and provides an avenue whereby one may legitimately disapprove of the last man in Sylvan's thought experiment, even from an anthropocentric viewpoint. A philosopher in the anthropocentric tradition may hold that the only sources of value are human preferences. However, 'she is not compelled to confine the objects of her attitudes to those that exist at the time at which she expresses them. Her moral utterances might express attitudes towards events and states of affairs over periods in which she no longer exists'. O'Neill et al (n 20) 117 (emphasis supplied).

However, this raises a further concern. If, say, enough people disliked bats,<sup>91</sup> bats would have a negative value. If a factory emitted noxious smoke that killed off the local bat population, economic theory would seem to suggest that the factory should not have to pay damages; in fact there might even be a case for compensating it.

# 2.4.2 Incommensurability

The previous sub-section was devoted to one particular assumption about the kind of value that matters in the valuation process. A more fundamental assumption is that valuation is possible at all, that is, that environmental values can be converted into a monetary equivalent.

The underlying assumption here is of *value commensurability* – 'the claim that there exists a common measure of value through which different options or states of affairs can be ordered.'<sup>92</sup> In case of environmental valuation, that common measure is money.

Not all writers accept this assumption. O'Neill *et al* hold that '[t]here are many values which simply cannot be converted into a monetary equivalent',<sup>93</sup> while for Ackerman and Heinzerling, the 'translation of all good things into dollars ... [is] inconsistent with the way many people view the world.'<sup>94</sup> These, then, are claims of *value incommensurability*.

<sup>&</sup>lt;sup>91</sup> This is not a wholly implausible example. Hargrove narrates how, as a cave conservationist, he learned that '[m]any people ... think that it would be a good idea for all bats to be killed on sight.' Hargrove (n 25) 192. The coyote is similarly unpopular: a contingent valuation survey has found that for some people, coyotes have negative existence value. Stevens *et al* (n 2) 396.

<sup>&</sup>lt;sup>92</sup> O'Neill *et al* (n 20) 71.

<sup>&</sup>lt;sup>93</sup> ibid 77.

<sup>&</sup>lt;sup>94</sup> Frank Ackerman and Lisa Heinzerling, 'Pricing the Priceless: Cost-Benefit Analysis of Environmental Protection' (2002) 150 University of Pennsylvania Law Review 1553, 1562.

Value incommensurability can take different forms.<sup>95</sup> One such conception is that 'in some conflicts of values, there is no true ranking of values.'<sup>96</sup> Another is what Griffin calls 'trumping': A trumps B if 'any amount of A, no matter how small, is more valuable than any amount of B, no matter how large.'<sup>97</sup>

One may also refuse to put a value on nature on the basis of what Raz calls *constitutive incommensurability*.<sup>98</sup> Raz gives the following example:

Many people ... will leave their spouses for a month to do a job they do not like in order to earn some money. And yet they will not agree to leave the spouse for the same month for an offer of money, even a significantly larger sum of money.<sup>99</sup>

Far from accepting such an offer, one may feel outraged by it, because acts – particularly acts of exchange involving money – are invested with symbolic significance. Sagoff expresses a similar attitude when he observes that '[t]he things we cherish, admire, or respect are not always the things we are willing to pay for. Indeed, they may be cheapened by being associated with money.'<sup>100</sup>

Some forms of environmental cost-benefit analysis ('CBA') require monetary valuation,<sup>101</sup> and Miller, one of its defenders, argues that if people are willing to

<sup>98</sup> Joseph Raz, *The Morality of Freedom* (Clarendon Press 1986) 345–53.

<sup>&</sup>lt;sup>95</sup> See Nien-hê Hsieh, 'Incommensurable Values' in Edward N Zalta (ed), The Stanford Encyclopedia of Philosophy (Spring 2016 Edition) <<u>http://plato.stanford.edu/archives/spr2016/entries/value-incommensurable/</u>> accessed 11 May 2016; Ruth Chang, 'Introduction' in Ruth Chang (ed), *Incommensurability, Incomparability, and Practical Reason* (Harvard University Press 1997).

<sup>&</sup>lt;sup>96</sup> Hsieh (n 95), citing Henry Richardson, *Practical Reasoning about Final Ends* (Cambridge University Press 1994).

 <sup>&</sup>lt;sup>97</sup> James Griffin, Well-Being: Its Meaning, Measurement and Importance (Clarendon Press 1986)
83.

<sup>&</sup>lt;sup>99</sup> ibid 348–49.

<sup>&</sup>lt;sup>100</sup> Mark Sagoff, *The Economy of the Earth: Philosophy, Law, and the Environment* (2nd edn, Cambridge University Press 2008) 62. See also O'Neill *et al* (n 20) 77: 'There are many values which simply cannot be converted into a monetary equivalent.'

<sup>&</sup>lt;sup>101</sup> Cannon distinguishes between *strong* CBA which seeks to monetise all costs and benefits, and *weak* CBA which simply weighs the desirable effects against the undesirable ones. Jonathan Cannon, 'Sounds of Silence: Cost-Benefit Canons in *Entergy Corp. v. Riverkeeper*,

compare *between* environmental goods, they should also be prepared to compare environmental goods and money.<sup>102</sup> More subtly, Alder acknowledges that CBA may not be a criterion of *moral rightness*, but defends it as a morally justified *decision procedure*.<sup>103</sup>

However, the fact remains that claims of value incommensurability are borne out by empirical studies. Participants in contingent valuation surveys have been known to register 'protest bids' – either by refusing to participate, or by registering zero or infinite bids.<sup>104</sup> In one study on the existence value of wildlife, the authors reported:

[M]any respondents failed to make 'rational' trade-offs between money and wildlife. For example, 44 percent of all respondents agreed with the statement that 'preservation of wildlife should not be determined by how much money can be spent' and 67 percent of all respondents agreed that, 'As much wildlife as possible should be preserved no matter what the cost.'<sup>105</sup>

An even more telling response to a contingent valuation survey is quoted by Burgess *et al:* 

[I]t's a totally disgusting idea, putting a price on nature. You can't put a price on the environment. You can't put a price on what you're

Inc.' (2010) 2 Harvard Environmental Law Review 425, 428–29. See also Lester B Lave, The Strategy of Social Regulation: Decision Frameworks for Policy (Brookings Institution 1981) 17–25.

<sup>&</sup>lt;sup>102</sup> David Miller, 'Social Justice and Environmental Goods' in Andrew Dobson (ed), Fairness and Futurity: Essays on Environmental Sustainability and Social Justice (Oxford University Press 1999) 162–63.

<sup>&</sup>lt;sup>103</sup> Matthew Adler, 'Incommensurability and Cost-Benefit Analysis' (1998) 146 University of Pennsylvania Law Review 1371. For further criticisms as well as defences of CBA, see Chapter 3, Section 3.3.

<sup>&</sup>lt;sup>104</sup> Brent Haddad and Richard Howarth, 'Protest Bids, Commensurability, and Substitution: Contingent Valuation and Ecological Economics' in Anna Alberini and James R Kahn (eds), *Handbook on Contingent Valuation* (Edward Elgar 2006) 134.

<sup>&</sup>lt;sup>105</sup> Stevens *et al* (n 2) 398.

going to leave for your children's children ... It's a heritage. It's not an open cattle market.<sup>106</sup>

# 2.5 Conclusion

Methodological challenges and philosophical objections notwithstanding, as the case studies in the following four chapters show, environmental valuation – and nonmarket valuation in general – is implicated in a range of legal contexts. In this chapter I set out the basic economic-theoretical framework of environmental valuation, using the second and third valuation choices (categories of value and methods of valuation) as an organising principle, defining key terms and concepts which are used throughout this thesis (e.g. non-use value and stated preference methods) while also highlighting certain methodological and philosophical challenges, some of which, as we will see in the following chapters, have influenced courts' attitudes towards valuation.

The common thread running through this chapter, and indeed this thesis as a whole, is the familiar point that the issues raised by economic valuation are seldom solely 'economic'. The subsequent chapters explore, from various angles, the implications of this observation for the role of judges in environmental valuation cases. This chapter has been as a springboard for that exploration.

<sup>&</sup>lt;sup>106</sup> Jacqueline Burgess, Judy Clark and Carolyn Harrison, Valuing Nature: What Lies Behind Responses to Contingent Valuation Surveys? (University College London 1995), quoted in O'Neill et al (n 20) 78.

# Chapter 3

# **Prospective Valuation in the US: Judicial Review of Regulatory Cost-Benefit Analysis**

# 3.1 Introduction

US regulatory agencies frequently use cost-benefit analysis ('CBA') in their decisionmaking, and several such CBAs have been challenged in court. Direct challenges to agency CBAs can take two forms. First, a court may be asked to review whether the agency was authorised to rely on a CBA (if it did) or whether it was required to (if it did not) – I call these **authorisation challenges**. Second, the challenge may be directed at the adequacy of the CBA itself – I call these **adequacy challenges**.<sup>1</sup> So far, the literature on judicial review of agency CBA, as discussed in Section 3.2 below, has mostly concentrated on the first category of cases; this chapter focuses on the second.

In this chapter, I analyse appellate court cases from 1981 to 2018,<sup>2</sup> which meet the following two criteria: (a) they involve one or more adequacy challenges to an agency CBA, and (b) that challenge (or those challenges) pertains to valuation of environmental costs or benefits. The focus on adequacy challenges is pertinent for two reasons. First, adequacy challenges, in comparison to authorisation challenges, have received limited attention in the literature, but they are no less important: regardless of whether a rule is struck down pursuant to an authorisation challenge or an adequacy challenge, the result is the same. Second, unlike authorisation challenge or no to rely (or not to rely) on

<sup>&</sup>lt;sup>1</sup> Cecot and Viscusi also make this distinction in a recent survey of thirty-eight cases involving judicial review of agency CBA (their sample is not environment-specific). Caroline Cecot and W Kip Viscusi, 'Judicial Review of Agency Benefit-Cost Analysis' (2015) 22(3) *George Mason Law Review* 575, 576–77. They also identify a third category: where a court uses an agency CBA to evaluate regulation even though the agency did not rely on the CBA. However, these cases do not involve a direct challenge to the CBA and as such fall outside the scope of this chapter.

<sup>&</sup>lt;sup>2</sup> I selected the year 1981 as the starting point of my analysis on the basis that this is when President Reagan's Executive Order 12,291 (see n 48 below) first introduced a formalised CBA requirement in the US regulatory process.

CBA, adequacy challenges require courts to scrutinise the CBA itself – and in a subset of these cases where the agency action has environmental impacts, courts are sometimes required to adjudicate questions of environmental valuation (for instance, environmental groups have challenged CBAs on the basis that the agency undervalued environmental costs (or benefits), while industry petitioners have challenged CBAs for the opposite reasons). Adequacy challenges involving environmental valuation, therefore, offer an opportunity to study US courts' approaches to prospective environmental valuation.

Using the analytical framework of valuation choices outlined in Chapter 1, authorisation challenges entail a 'step zero' choice of whether the agency's use of CBA was mandated, permitted or prohibited – that is, whether or not it could (or should) use quantitative cost-benefit analysis,<sup>3</sup> and therefore, whether or not to use formal valuation. On the other hand, adequacy challenges, as the case-law analysis in Section 3.5 reveals, typically involve the second and third valuation choices, relating to scope and methodology.

The analysis yields two main insights, which are the key contributions of this chapter. First, empirically speaking, in the realm of challenges to the adequacy of environmental valuation in agency CBA, successful challenges are the exception rather than the norm. Second, by using the valuation choices framework to (a) separate authorisation and adequacy challenges and (b) categorise adequacy challenges into scope and methodology challenges, we see that that while courts tend to be generally deferential of agency decisions on environmental CBA, they are *more* deferential when it comes to methodology challenges as opposed to scope challenges. Environmental valuation by courts, as I argue throughout this thesis and more particularly in Chapter 8, should be and usually is *context-driven*. In the case of judicial review of environmental valuation in agency CBA, the economic-theoretical context

<sup>&</sup>lt;sup>3</sup> For a more precise definition of cost-benefit analysis as the term is used in this chapter, please see Section 3.3.1 below.

(Section 3.3) and the institutional context (Section 3.4) largely explains the empirical findings on how courts have ruled on these challenges.

This chapter proceeds as follows. Section 3.2 reviews the literature on agency CBA in general and judicial review of agency CBA in particular, and also draws attention to the oft-neglected area of 'adequacy challenges'. In Section 3.3, I outline the debate around CBA, especially when it comes to decision-making in a non-market domain such as the environment; the terms of this debate, as we see (momentarily jumping ahead) in Section 3.5, have informed courts' decisions on agency CBA as well as scholarly criticisms thereof.

Section 3.4 is an overview of the institutional framework – the executive, legislative and judicial/interpretive context – in which US regulatory agencies typically perform CBA. In Section 3.5, I analyse appellate court cases where there were one or more adequacy challenges to an agency CBA implicating valuation of environmental costs or benefits; I outline my methodology for identifying the cases, and classify them into 'scope' and 'methodology' challenges. Section 3.6 extends this analysis: exploring what the case law reveals about the kinds of adequacy challenges, their likelihood of success, and implications for judicial review. Section 3.7 concludes.

#### 3.2 Literature review

#### 3.2.1 Standard of review

This chapter draws on, and contributes to, the literature on judicial review of CBA by regulatory agencies. The central question animating much of this literature is: how closely should courts scrutinise the use of CBA by regulatory agencies?

'Not very closely' is the position taken by Sunstein, who favours a passive judicial role.<sup>4</sup> For Gersen and Vermeule, judicial review of the rationality of agency decisionmaking under the 'arbitrary and capricious' standard is and should be

<sup>&</sup>lt;sup>4</sup> Cass R Sunstein, 'Cost-Benefit Analysis and Arbitrariness Review' (2017) 41 *Harvard Environmental Law Review* 1, 11. However the main thrust of his argument in this paper is that, in the absence of a statutory prohibition, an agency's decision *not* to engage in quantified CBA requires a non-arbitrary explanation.

'powerfully deferential',<sup>5</sup> simply requiring 'that agencies act based on reasons'.<sup>6</sup> Masur and Posner take a contrary view, arguing for a higher degree of judicial scrutiny<sup>7</sup> – a view which is also espoused by Abramowicz in a review of one of Sunstein's earlier works.<sup>8</sup>

As it happens, this particular debate has tended to focus overwhelmingly on authorisation challenges. However, the 'central question' referred to above really conceals two questions: First (in case of authorisation challenges), how closely should courts scrutinise agencies' decisions to conduct CBA? And second (in case of adequacy challenges), how closely should they scrutinise the CBA itself? In Sections 3.5 and 3.6 of this chapter, by analysing appellate-court case law on adequacy challenges, I attempt to shed some light on the oft-neglected second question.

# 3.2.2 *Empirical literature*

Besides offering normative arguments about the standard of review, several articles also analyse case law in order to establish what standard(s) of review courts are applying in practice. Cannon<sup>9</sup> focuses primarily on the Supreme Court's decision in *Entergy Corp. v Riverkeeper, Inc. ('Entergy')*,<sup>10</sup> involving regulations under the Clean Water Act. Sunstein discusses two 'leading decisions':<sup>11</sup> *Michigan v EPA*<sup>12</sup> (mercury regulation) and *Business Roundtable*<sup>13</sup> (proxy voting in companies). Masur and

Jacob Gersen and Adrian Vermeule, 'Thin Rationality Review' (2015) 114(8) *Michigan Law Review* 1355, 1359. The authors focus on judicial review of the rationality of agency decision-making more generally, but they also discuss agency CBA under the same rubric. ibid 1373–84.

<sup>&</sup>lt;sup>6</sup> ibid 1406.

<sup>&</sup>lt;sup>7</sup> Jonathan S Masur and Eric A Posner, 'Cost-Benefit Analysis and the Judicial Role' (2018) 85(4) University of Chicago Law Review 935, 970–76.

<sup>&</sup>lt;sup>8</sup> Michael Abramowicz, 'Toward a Jurisprudence of Cost-Benefit Analysis' (2002) 100 Michigan Law Review 1708, 1731, reviewing Cass R Sunstein, The Cost-Benefit State: The Future of Regulatory Protection (American Bar Association 2002).

<sup>&</sup>lt;sup>9</sup> Jonathan Cannon, 'Sounds of Silence: Cost-Benefit Canons in *Entergy Corp. v. Riverkeeper, Inc.*' (2010) 2 *Harvard Environmental Law Review* 425.

<sup>&</sup>lt;sup>10</sup> 556 US 208 (2009).

<sup>&</sup>lt;sup>11</sup> Sunstein (n 4) 14.

<sup>&</sup>lt;sup>12</sup> 135 S Ct 2699 (2015).

<sup>&</sup>lt;sup>13</sup> Business Roundtable v Securities and Exchange Commission 647 F 3d 1144 (DC Cir 2011).

Posner<sup>14</sup> analyse two circuit court decisions: Corrosion Proof Fittings<sup>15</sup> (asbestos regulation) and the aforementioned Business Roundtable, while also tracing the overall trajectory of Supreme Court jurisprudence on CBA.

An alternative to the 'leading cases' approach is what we may call the sampling approach. Cecot and Viscusi survey a 'substantial sample' of thirty-eight cases involving judicial review of agency CBA,<sup>16</sup> providing 'an overview and a critical assessment'.<sup>17</sup> Bull and Ellig<sup>18</sup> examine forty-two cases (the thirty-eight identified by Cecot and Viscusi,<sup>19</sup> plus four others) where courts 'assessed some aspect' of an agency's regulatory impact analysis, arguing for more concrete statutory guidance with respect to judicial review of regulatory impact analysis.

The cases studied by Cecot and Viscusi and by Bull and Ellig involve regulations in diverse (sometimes overlapping) domains, including corporate governance, transport, health and safety and the environment. Others have taken a sector-specific approach. Coates focuses on judicial review of CBA of financial regulation, arguing against judicially enforced, quantified CBA in the realm of finance.<sup>20</sup> Lastly, Sinden reviews eight cases – again focusing on authorisation review – wherein the Supreme Court 'has addressed the propriety of CBA or cost considerations in connection with environmental decisionmaking'.21

<sup>&</sup>lt;sup>14</sup> Masur and Posner (n 7).

<sup>&</sup>lt;sup>15</sup> Corrosion Proof Fittings v EPA 947 F 2d 1201 (5th Cir 1991).

<sup>&</sup>lt;sup>16</sup> Cecot and Viscusi (n 1) 577. 'Although not an exhaustive census of all appellate cases involving [CBA], this substantial sample offers a comprehensive perspective on the state of judicial review.' Ibid 578. Their selection methodology is described at ibid 589. <sup>17</sup> ibid 577.

<sup>&</sup>lt;sup>18</sup> Reeve Bull and Jerry Ellig, 'Judicial Review of Regulatory Impact Analysis: Why Not the Best?' (2017) 69(4) Administrative Law Review 725, 731. Regulatory impact analysis includes (some form of) CBA, but also other elements such as analysis of the systemic problem and consideration of alternatives. ibid 731-37.

<sup>19</sup> ibid.

<sup>&</sup>lt;sup>20</sup> John C Coates IV, 'Cost-Benefit Analysis of Financial Regulation: Case Studies and Implications' (2015) 124 Yale Law Journal 882. The case law analysis is at ibid 912-20.

<sup>&</sup>lt;sup>21</sup> Amy Sinden, 'A "Cost-Benefit State"? Reports of Its Birth Have Been Greatly Exaggerated' (2016) 46 Environmental Law Reporter 10933, 10935.

### 3.3 The CBA controversy

#### 3.3.1 Defining CBA

CBA can mean different things to different people. The term, as Sinden observes, includes 'a broad range of decision-making practices, from highly formal modes of economic analysis to Ben Franklin's informal weighing of pros and cons'.<sup>22</sup> The Tenth Circuit has recognised as much:

The label 'cost-benefit analysis' encompasses everything from a strict mathematical balancing formula to a less strict standard that merely requires the agency to recognize both the costs and benefits of specific proposed alternatives and consider the differences in choosing an appropriate alternative. 'Labels are neither important nor determinative.'<sup>23</sup>

If labels *are* to be used, however, it is useful to have a shared understanding as to what they denote. In this chapter, I use the term CBA to denote a decision procedure where *at least some of the costs* and *at least some of the benefits* of an action are expressed in terms of a common metric (typically monetary units) for purposes of comparison.<sup>24</sup> In other words, the 'step zero' valuation question – whether to use monetary

<sup>&</sup>lt;sup>22</sup> Amy Sinden, 'Cost-Benefit Analysis, Ben Franklin, and the Supreme Court' (2014) 4 UC Irvine Law Review 1175, 1213.

<sup>&</sup>lt;sup>23</sup> American Mining Congress v Thomas 772 F 2d 617 (10th Cir 1985) 631 (quoting American Petroleum Institute v EPA 540 F 2d 1023 (10th Cir 1976) 1037).

<sup>&</sup>lt;sup>24</sup> Farber uses the term 'soft' CBA for a comparison of costs and benefits 'without attempting to quantify every factor'. Daniel Farber, *Eco-Pragmatism: Making Sensible Environmental Decisions in an Uncertain World* (University of Chicago Press 1999) 93. Cannon distinguishes between *strong* and *weak* forms of CBA. Cannon (n 9) 428–29. Sinden uses the terms *formal CBA* and *informal CBA*, and makes the important point that a CBA can also lie somewhere along the 'formality-informality spectrum', for example where some costs and benefits are quantified while others are compared qualitatively. Sinden (n 22) 1177. The Tenth Circuit has used the term *cost-benefit optimization* to denote 'the strictest type of cost-benefit analysis [which] requires quantification of costs and benefits and a mathematical balancing of the two to determine the optimum result') and *cost-benefit rationalization* to denote 'a considerably looser cost-benefit approach [which] requires the agency merely to consider and compare the costs and benefits of various approaches, and to choose an approach in which costs and benefits are reasonably related in light of Congress' intent'. *Quivira Mining Co. v US Nuclear Regulatory Commission* 866 F 2d 1246 (10th Cir 1989) 1250.

valuation – has been answered in the affirmative for (some subset of) the costs as well as (some subset of) the benefits.

CBA is controversial, especially if, as is often the case, the quantification exercise involves non-market valuation, that is, techniques for valuing goods and services that are not traded on the market.<sup>25</sup> CBA-sceptics have routinely criticised attempts to quantify intangible costs and benefits, as well as the practice of aggregating and comparing them.

# 3.3.2 *Criticism of quantification*

Criticism of quantification may be directed at the methodology, for instance, questioning the reliability of willingness-to-pay ('WTP') as a proxy for welfare,<sup>26</sup> and the use of discount rates.<sup>27</sup> More generally, the methods have been criticised for being value-laden<sup>28</sup> and discretionary (while claiming to be objective)<sup>29</sup>, and complex and opaque in their technicality (while claiming to be transparent).<sup>30</sup>

At a more fundamental level, for some critics, the very act of 'reducing', say, human lives or the benefits of clean air to dollars and cents is problematic – or as Kuttner

<sup>&</sup>lt;sup>25</sup> For an overview of non-market valuation including methodological and philosophical challenges, see Chapter 2. For a more detailed account of non-market valuation methods, see A Myrick Freeman III, Joseph A Herriges and Catherine L Kling, *The Measurement of Environmental and Resource Values: Theory and Methods* (3rd edn, RFF Press 2003) 24–26.

<sup>&</sup>lt;sup>26</sup> See e.g. Robert K Niewijk, Note, 'Ask a Silly Question: Contingent Valuation of Natural Resource Damages' (1992) 105 *Harvard Law Review* 1981; Mark Sagoff, *The Economy of the Earth: Philosophy, Law, and the Environment* (2nd edn, Cambridge University Press 2008) ch 4.

<sup>&</sup>lt;sup>27</sup> Frank Ackerman and Lisa Heinzerling, 'Pricing the Priceless: Cost-Benefit Analysis of Environmental Protection' (2002) 150 University of Pennsylvania Law Review 1553, 1570–73.

<sup>&</sup>lt;sup>28</sup> ibid 1576–77. This criticism has been levelled at the discipline of economics more generally. Deirdre N McCloskey, *The Rhetoric of Economics* (2nd edn, University of Wisconsin Press 1998) 175–77.

<sup>&</sup>lt;sup>29</sup> 'Except in extreme cases, the result of a cost-benefit analysis often turns on a series of discretionary judgments; competent, reasonable analysts can come up with quite different but equally defensible answers.' Daniel A Farber, 'Revitalizing Regulation' (1993) 91(6) *Michigan Law Review* 1278, 1282.

<sup>&</sup>lt;sup>30</sup> Ackerman and Heinzerling (n 27) 1577–78.

puts it, 'ghoulish'.<sup>31</sup> The incommensurability thesis maintains that 'many values ... simply cannot be converted into a monetary equivalent',<sup>32</sup> while for Ackerman and Heinzerling, the 'translation of all good things into dollars ... [is] inconsistent with the way many people view the world.'<sup>33</sup> Sagoff, a vocal critic of CBA in environmental policy, holds that economic valuation can plausibly measure 'value in exchange' but not 'value in use', i.e. 'the benefit or utility an object provides'.<sup>34</sup> Yet another objection is that the very act of putting a price on something can reduce its perceived value: Kelman likens CBA to 'the thermometer that, when placed in a liquid to be measured, itself changes the liquid's temperature.'<sup>35</sup>

#### 3.3.3 Criticism of aggregation and comparison

CBA entails not only quantifying costs and benefits, but aggregating and comparing them, and this latter step is also controversial. For a proposal to pass muster, the total benefits must exceed the total costs, but the benefits and costs may accrue to different

<sup>&</sup>lt;sup>31</sup> Robert Kuttner, Everything for Sale: The Virtues and Limits of Markets (University of Chicago Press 1999) 301. See also Elizabeth Anderson, Value in Ethics and Economics (Harvard University Press 1995) 190–210.

<sup>&</sup>lt;sup>32</sup> John O'Neill, Alan Holland and Andrew Light, *Environmental Values* (Routledge 2008) 77. Pearce describes incommensurability as 'the single most controversial issue in CBA'. David Pearce, 'Cost-Benefit Analysis and Environmental Policy' (1998) 14(4) Oxford Review of Economic Policy 84, 86. For an overview and assessment of the arguments for and against incommensurability in the context of CBA, see Jonathan Aldred, 'Incommensurability and Monetary Valuation' (2006) 82 Land Economics 14.

<sup>&</sup>lt;sup>33</sup> Ackerman and Heinzerling (n 27) 1562.

<sup>&</sup>lt;sup>34</sup> Mark Sagoff, *Price, Principle, and the Environment* (Cambridge University Press 2004) 7. As Sagoff acknowledges, the distinction between value in exchange and value in use was made long ago by Adam Smith. Adam Smith, *An Enquiry into the Nature and Causes of the Wealth of Nations* (first published 1776, Oxford University Press 1991) 48. In fact, the socalled 'paradox of value' was recognised as far back as the ancient Greeks: 'For only what is rare is valuable; and "water," which ... is the "best of all things," is also the cheapest.' Plato, *The Dialogues of Plato* vol 1 (tr Benjamin Jowett, 3rd edn, Oxford University Press 1892) 245.

<sup>&</sup>lt;sup>35</sup> Steven Kelman, 'Cost-Benefit Analysis: An Ethical Critique' (1981) 5 *Regulation* 33, 38. See also John O'Neill, *Markets, Deliberation and Environment* (Routledge 2007) 7, 21–25, defending the view that 'the source of our environmental problems lies not in the failure to expand market norms to all spheres, but in that very process of expansion'.

sections of society, and there is no requirement that the losers be compensated.<sup>36</sup> It is entirely possible – some would say likely – that costs and benefits are distributed in such a way that the rich get richer and the poor get poorer.<sup>37</sup>

#### 3.3.4 Defences

Defences of CBA take various forms. Advocates of CBA point to its perceived advantages, for instance that valuation can guard against biases and blunders,<sup>38</sup> promote 'accountability, transparency, and consistency', and help achieve 'sensible trade-offs'.<sup>39</sup> Second, some scholars seek to counter specific criticisms of CBA. Thus, Viscusi argues that far from devaluing intangible benefits, CBA ensures that they receive due consideration,<sup>40</sup> and Kornhauser acknowledges that CBA ignores distributional concerns, but argues that such concerns are perhaps better addressed through other institutions.<sup>41</sup> Third, economists continue to try and improve CBA methodology. For example, well-designed questionnaires can improve the reliability

<sup>&</sup>lt;sup>36</sup> Amartya Sen, 'The Discipline of Cost-Benefit Analysis' (2000) 29(S2) Journal of Legal Studies 931, 947. This criticism applies to utilitarianism more generally. As Rawls famously argued, the utilitarian legislator aims to make choices which would maximise satisfaction across society, much in the same way that an individual aims to make choices which would maximise her private satisfaction. Thus, '[u]tilitarianism does not take seriously the distinction between persons.' John Rawls, A Theory of Justice (first published 1971, Harvard University Press 2009) 27. For a criticism of the wealth-transfer effects of CBA in the particular context of environmental regulation, see Karl S Coplan, 'The Missing Element of Environmental Cost-Benefit Analysis: Compensation for the Loss of Regulatory Benefits' (2018) 30 Georgetown Environmental Law Review 281.

<sup>&</sup>lt;sup>37</sup> Ackerman and Heinzerling (n 27) 1573–75; Kuttner (n 31) 301.

 <sup>&</sup>lt;sup>38</sup> Cass R Sunstein, 'Cost-Benefit Analysis and the Environment' (2005) 115(2) *Ethics* 351, 356.

<sup>&</sup>lt;sup>39</sup> Cass R Sunstein, 'The Limits of Quantification' (2014) 102 California Law Review 1369, 1379. See also David Schmidtz, 'A Place for Cost-Benefit Analysis' (2001) 11 Philosophical Issues 148, 151.

<sup>&</sup>lt;sup>40</sup> W Kip Viscusi, 'Monetizing the Benefits of Risk and Environmental Regulation' (2005) 33 *Fordham Urban Law Journal* 1003, 1003–04, reviewing Frank Ackerman and Lisa Heinzerling, *Priceless: On Knowing the Price of Everything and the Value of Nothing* (The New Press 2004). For responses to several other common criticisms of CBA including incommensurability, commodification and anthropocentrism, see Schmidtz (n 36).

<sup>&</sup>lt;sup>41</sup> Lewis A Kornhauser, 'On Justifying Cost-Benefit Analysis' (2000) 29(S2) Journal of Legal Studies 1037, 1054.

of WTP surveys,<sup>42</sup> and concerns around fair distribution could in theory be addressed by using distributional weights which level the playing field.<sup>43</sup>

In this chapter, I do not take a position on what role, if any, CBA should play in environmental decision-making. Rather, I take the agency's decision to use (or not to use) CBA as a given. The focus is on challenges to, and judicial review of, *how* the CBA was conducted. For this reason, in the foregoing overview of the CBA debate, I adopted a broad-brush approach, aiming not to capture every nuance of the debate but only to pave the way for a better appreciation of the role of courts in evaluating CBAs. Nevertheless, it is worth acknowledging that the categorisation of CBA scholarship into pro- and anti-CBA camps is an oversimplification. As Posner notes, some scholars reject CBA entirely while others defend it, but there are also those who are merely sceptical, and those who would retain CBA but with significant alterations.<sup>44</sup> One might also endorse the use of CBA for certain purposes (e.g. as a decision rule).<sup>45</sup> Or, one might endorse the use of CBA as an input into the decision-making process, while being opposed to the idea of treating it as determinative.<sup>46</sup>

# 3.4 Institutional context

#### 3.4.1 *Executive orders*

The US state's involvement with CBA goes at least as far back as 1936, when the US Flood Control Act provided that the Federal Government should undertake flood-control projects 'if the benefits to whomsoever they accrue are in excess of the

<sup>&</sup>lt;sup>42</sup> Richard Carson and Theodore Groves, 'Incentive and Informational Properties of Preference Questions' (2007) 37(1) *Environmental and Resource Economics* 181.

<sup>&</sup>lt;sup>43</sup> Matthew D Adler, 'Benefit-Cost Analysis and Distributional Weights: An Overview' (2016) 10(2) *Review of Environmental Economics and Policy* 264; Väinö Nurmi and Heini Ahtiainen, 'Distributional Weights in Environmental Valuation and Cost-benefit Analysis: Theory and Practice' (2018) 150 *Ecological Economics* 217.

<sup>&</sup>lt;sup>44</sup> Richard A Posner, 'Cost-Benefit Analysis: Definition, Justification, and Comment on Conference Papers' (2000) 29(S2) *Journal of Legal Studies* 1153, 1156.

<sup>&</sup>lt;sup>45</sup> Posner's (ibid 1174–75) characterisation of Richardson's position in Henry S Richardson, 'The Stupidity of the Cost-Benefit Standard' (2000) 29(S2) *Journal of Legal Studies* 971.

<sup>&</sup>lt;sup>46</sup> Sunstein (n 38).

estimated costs'.<sup>47</sup> Forty-five years later, the Reagan administration was the first to introduce a formalised CBA requirement in the US regulatory process. Executive Order 12,291 was issued by President Reagan in his first month in office; one of its primary objectives was to 'reduce the burdens of existing and future regulations'.<sup>48</sup> It provided that regulatory action 'shall not be undertaken unless the potential benefits to society for the regulation outweigh the potential costs to society',<sup>49</sup> and required agencies to 'set regulatory priorities with the aim of maximizing the aggregate net benefits to society'.<sup>50</sup>

Executive Order 12,291 was replaced by President Clinton's Executive Order 12,866, which likewise provides that agencies must 'propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs', while however 'recognizing that some costs and benefits are difficult to quantify'.<sup>51</sup> This in turn was supplemented by President Obama's Executive Order 13,563 which reaffirms the same principles and in addition directs agencies 'to use the best available techniques to quantify anticipated present and future benefits and costs as accurately as possible'.<sup>52</sup> However, it does permit agencies to 'consider (and discuss qualitatively) values that are difficult or impossible to quantify, including equity, human dignity, fairness, and distributive impacts.'<sup>53</sup>

Besides these general requirements, for economically significant regulatory actions,<sup>54</sup> agencies are currently required to analyse and, 'to the extent feasible' quantify, the

<sup>48</sup> 46 Fed Reg 13193 (1981) 13193.

- <sup>51</sup> 58 Fed Reg 51735 (1993) s 1(b).
- <sup>52</sup> 76 Fed Reg 3821 (2011) s 1(c).
- 53 ibid.

<sup>&</sup>lt;sup>47</sup> Public Law 738, 74th Congress, s 1. See however, Robert Dorfman, 'Forty Years of Cost-Benefit Analysis' in Richard Stone and William Peterson (eds), *Econometric Contributions to Public Policy* (Palgrave Macmillan 1978) 269: 'there is good reason to believe that not all of the projects authorised in the later sections met the standard so bravely announced in Section 1'.

<sup>&</sup>lt;sup>49</sup> ibid s 2(b).

<sup>&</sup>lt;sup>50</sup> ibid s 2(e).

<sup>&</sup>lt;sup>54</sup> 'Economically significant regulatory actions' are those that are likely to result in a rule that may '[h]ave an annual effect on the economy of \$100 million or more or adversely

anticipated costs and benefits.<sup>55</sup> Of course, all of these provisions are subordinate to statute and only apply 'to the extent permitted by law'.<sup>56</sup>

# 3.4.2 Legislative mandates and judicial interpretation

As it happens, the enabling statute sometimes does prohibit cost considerations. The Endangered Species Act provides that decisions to list species as endangered or threatened shall be made 'solely on the basis of the best scientific and commercial data available',<sup>57</sup> which courts have interpreted to mean 'without reference to the economic effects of that decision'.<sup>58</sup> In such cases, the 'step zero' question has been answered by the statute itself – or at least, by the statute as interpreted by the court – and the answer is in the negative: valuation is impermissible.

At the other end of the spectrum, a statute may *require* CBA. For instance, under the Federal Insecticide, Fungicide, and Rodenticide Act, 'unreasonable adverse effects on the environment' are to be determined 'taking into account the economic, social, and

affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities'. Exec Order No 12,866 (n 51) s 2(f)(1).

<sup>&</sup>lt;sup>55</sup> ibid s 6(a)(1)(C).

<sup>&</sup>lt;sup>56</sup> The orders also exempt independent agencies as defined by the Paperwork Reduction Act, 44 USC 3501 et seq., 3502(5). One of the characteristic features of independent agencies, like the Federal Trade Commission, is that commissioners can only be removed for express causes, unlike heads of non-independent agencies like the Environmental Protection Agency, who 'hold their positions at the pleasure of the President, who may remove them from office for any reason'. Office of Legal Counsel, 'Memorandum on Proposed Executive Order Entitled "Federal Regulation"' (1981) <<u>https://www.justice.gov/file/22586/download</u>> accessed 22 March 2018. For further discussion see Paul R Verkuil, 'The Purposes and Limits of Independent Agencies' (1988) *Duke Law Journal* 257; Curtis W Copeland, 'Economic Analysis and Independent Regulatory Agencies' (2013) Report drafted for the Administrative Conference of the United States < https://www.acus.gov/sites/default/files/documents/Copeland%20Final%20BC A%20Rep

https://www.acus.gov/sites/default/files/documents/Copeland%20Final%20BCA%20Rep ort%204-30-13.pdf> accessed 23 March 2018.

<sup>&</sup>lt;sup>57</sup> 16 USC 1531 et seq., 1533(b)(1)(A).

<sup>&</sup>lt;sup>58</sup> Arizona Cattle Growers' Ass'n v. Salazar 606 F.3d 1160 (9th Cir 2009) 1172.

environmental costs and benefits of the use of any pesticide'.<sup>59</sup> Here, the 'step zero' question is answered in the affirmative: valuation is mandated.

Authorisation challenges to agency CBA generally involve statutory provisions which neither explicitly prohibit nor explicitly require CBA. Such provisions may be construed in three ways: (1) as implicitly *prohibiting* CBA, (2) as implicitly *authorising* CBA (that is, giving the agency discretion as to whether or not to rely on CBA), or (3) as implicitly *requiring* CBA.

As an example of the first category, in the context of setting national ambient air quality standards under section 109 of the Clean Air Act,<sup>60</sup> the Supreme Court has held that the absence of explicit statutory authorisation implies that the Environmental Protection Agency ('EPA') is not allowed to consider implementation costs in setting ambient air quality standards.<sup>61</sup> More generally, the DC Circuit Court has held that 'the statute and its legislative history make clear that economic considerations play no part in the promulgation of ambient air quality standards'.<sup>62</sup>

An example of the second category (a provision interpreted as permitting but not requiring CBA) is section 316(b) of the Clean Water Act, which requires the EPA to set performance standards such that water intake structures of power plants 'reflect the best technology available for minimizing adverse environmental impact'.<sup>63</sup> The section is silent on CBA, but the Supreme Court has held that the EPA permissibly relied on CBA in setting such standards.<sup>64</sup>

<sup>&</sup>lt;sup>59</sup> 7 USC 136 et seq., 136(bb). For additional examples (not limited to environmental law), see Cecot and Viscusi (n 1) 584; Sunstein (n 4) 21.

<sup>&</sup>lt;sup>60</sup> 42 USC 7401 et seq., 7409(b).

<sup>&</sup>lt;sup>61</sup> Whitman v Am Trucking Ass'ns 531 U.S. 457 (2001) 468. In such cases, as Sinden has observed, agencies can 'find themselves in the anomalous position of having to perform a CBA under the executive orders, upon which they are not permitted to rely in their actual decision making.' Amy Sinden, 'The Problem of Unquantified Benefits' (2019) 49 *Environmental Law* 73, 95.

<sup>&</sup>lt;sup>62</sup> Lead Industries Ass'n v EPA 647 F 2d 1130 (DC Cir 1980) 1148.

<sup>&</sup>lt;sup>63</sup> 33 USC 1251 et seq., 1326(b).

<sup>&</sup>lt;sup>64</sup> Entergy (n 10) 226.

While there are statutes which explicitly require CBA (for instance, the Federal Insecticide, Fungicide, and Rodenticide Act referenced above), no statutory provision to date has been interpreted as *implicitly* requiring formal, quantified CBA. The closest courts have come to such an interpretation is in *Michigan v EPA*, where the Supreme Court held, by a 5–4 majority, that the EPA acted unreasonably when it deemed cost irrelevant to its decision to regulate power plants under the Clean Air Act.<sup>65</sup> The court held that the EPA 'must consider cost',<sup>66</sup> but followed up with a key clarification:

We need not and do not hold that the law unambiguously required the Agency, when making this preliminary estimate, to conduct a formal cost-benefit analysis in which each advantage and disadvantage is assigned a monetary value. It will be up to the Agency to decide (as always, within the limits of reasonable interpretation) how to account for cost.<sup>67</sup>

In other words, the court did not definitively answer the 'step zero' question in the affirmative. It held that the agency must account for cost, but consciously and expressly stopped short of holding that such accounting must take the formal, quantitative form which is the essence of economic valuation, as well as of the definition of CBA used for purposes of this chapter.<sup>68</sup>

In sum, challenges involving agency CBA fall into two categories. *Authorisation challenges* are cases where (a) an agency decision to rely on CBA in rule-making is challenged on the basis that it was statutorily not permitted to do so (i.e. it was not

<sup>68</sup> See Section 3.3.1.

<sup>&</sup>lt;sup>65</sup> *Michigan* (n 12) 2712. Justice Kagan, in his dissent, agreed that 'the regulation would be unreasonable if "[t]he Agency gave cost no thought *at all*."' ibid 2714, citing the majority decision at 2707. However, he argued that 'that is just not what happened here', and that the EPA did in fact take costs into account 'at multiple stages and through multiple means'. ibid 2714.

<sup>&</sup>lt;sup>66</sup> ibid 2711.

<sup>&</sup>lt;sup>67</sup> ibid. More decisively, the DC Circuit Court has subsequently held that '[t]he statute does not mandate a particular method of cost-benefit analysis'. *Nat'l Ass'n for Surface Finishing v EPA* 795 F 3d 1 (DC Cir 2015) 10. The difference may be summarised as: 'We do not hold that formal CBA is required' (*Michigan*) versus 'We hold that formal CBA is not required' (*Surface Finishing*).

authorised to rely on CBA), or (b) an agency decision *not* to rely on CBA is challenged on the basis that it was required to do so (i.e. it was not authorised to eschew CBA).

# 3.4.3 Standard of review

Authorisation challenges are adjudicated under the so-called *Chevron* two-step test. Laid down in by the Supreme Court in *Chevron USA, Inc. v Natural Resources Defense Council, Inc.,*<sup>69</sup> the doctrine applies to judicial review of agency interpretations of federal statutes. It directs courts to first examine whether Congress has 'directly spoken to the precise question at issue'.

If the intent of Congress is clear, that is the end of the matter; for the court, as well as the agency, must give effect to the unambiguously expressed intent of Congress. If, however, the court determines Congress has not directly addressed the precise question at issue ... Rather ... the question for the court is whether the agency's answer is based on a permissible construction of the statute.<sup>70</sup>

However, even where an agency was authorised or even required to rely on CBA, the adequacy of the CBA may be assailed – I call these *adequacy challenges*. When the adequacy of a CBA is challenged, the scope of review is dictated by the so-called 'hard look review' under the Administrative Procedure Act: the court shall set aside set aside agency actions that are found to be 'arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law'.<sup>71</sup>

<sup>&</sup>lt;sup>69</sup> 467 US 837 (1984).

<sup>&</sup>lt;sup>70</sup> ibid 842–43. See also Ronald M Levin, 'The Anatomy of *Chevron*: Step Two Reconsidered' (1997) 72 *Chicago-Kent Law Review* 1253; Jason J Czarnezki, 'An Empirical Investigation of Judicial Decisionmaking, Statutory Interpretation, and the Chevron Doctrine in Environmental Law' (2008) 79 *University of Colorado Law Review* 767; Cass R Sunstein, 'Chevron Step Zero' (2006) 92 *Virginia Law Review* 187.

<sup>&</sup>lt;sup>71</sup> 5 USC 701 et seq., 706. See also Cass R Sunstein, 'In Defense of the Hard Look: Judicial Activism and Administrative Law' (1984) 7 *Harvard Journal of Law & Public Policy* 51; Patrick M Garry, 'Judicial Review and the Hard Look Doctrine' (2006) 7 *Nevada Law Journal* 151; Louis J Virelli III, 'Deconstructing Arbitrary and Capricious Review' (2013-2014) 92 North Carolina Law Review 721.

## 3.5 Adequacy challenges involving environmental valuation

#### 3.5.1 *Case selection*

In this chapter I analyse appellate court cases from 1981 to 2018,<sup>72</sup> which meet the following two criteria: (a) they involve one or more adequacy challenges to an agency CBA, *and* (b) that challenge, or those challenges, pertain to quantitative valuation of environmental costs or benefits. The first criterion excludes cases which *only* involved authorisation challenges. The second criterion excludes cases which involved adequacy challenges, but where environmental valuation was not implicated. This excludes cases involving environmental costs or benefits which were not formally quantified, as well as cases involving costs or benefits which were quantified but not directly related to the environment.<sup>73</sup>

The cases were identified via a set of specific searches on the Lexis 'US federal cases' database, using search terms such as <cost benefit analysis>, <benefit cost analysis>, <environmental costs>, <environmental benefits>, <monetize costs>, <monetize benefits> and similar variants. Where applicable, the searches were further narrowed by (a) searching within results for occurrences of <environment> or (b) filtering by 'environmental law' (which is a Lexis category). I also checked relevant internal citations within cases, and cross-checked against the set of 38 cases identified by Cecot and Viscusi.<sup>74</sup> (Cecot and Viscusi's sample is, however, both wider, in that it includes judicial review of agency CBA in all areas (not just environmental), and narrower, in that it spans a time period from 1984 to 2014.) Finally, using the criteria

<sup>&</sup>lt;sup>72</sup> As noted earlier, I chose the year 1981 as the starting point of my analysis on the basis that this is when President Reagan's Executive Order 12,291 (see n 48 above) first introduced a formalised CBA requirement in the US regulatory process.

<sup>&</sup>lt;sup>73</sup> For instance, consider a regulation which has projected environmental benefits but imposes costs to industry. Industry petitioners might challenge the adequacy of the agency's CBA for such a regulation on the basis that the agency overvalued environmental benefits (see e.g. *Zero Zone, Inc. v United States DOE* 832 F 3d 654 (7th Cir 2016) 677, discussed in Section 3.5.5 below). Alternatively, they may challenge it on the basis that the agency undervalued costs to industry (see e.g. *American Mining Congress v Thomas* (n 23) 630). I have included the former category of cases in my sample but, given my overall focus on *environmental* valuation, not the latter.

<sup>&</sup>lt;sup>74</sup> Cecot and Viscusi (n 1).

set out above, namely adequacy challenges pertaining specifically to valuation of environmental costs or benefits, the set of cases identified via the searches was further narrowed to a total of nine cases, which I discuss and analyse in detail below (the remainder were excluded either because they involved authorisation challenges only, or because they did not involve valuation of *environmental* costs or benefits).

# 3.5.2 Typology of challenges

Even within the specific category of adequacy challenges pertaining to valuation of environmental costs or benefits, there is a good deal of variance. Cases could be classified according to the agency which performed the CBA, the legislation which authorised the regulatory action and/or the CBA, whether the action had projected environmental *benefits* (that is, whether it was, broadly speaking, 'pro-environment', for instance, promulgating more stringent energy efficiency standards) or environmental *costs* (that is, whether it was 'anti-environment', for instance, permitting offshore oil and gas leasing), and whether the CBA challenge came from environmental petitioners or industry petitioners (in general, 'pro-environment' agency actions tend to be challenged by industry petitioners, but there are exceptions – for instance, 'pro-environment' action has been challenged by environmental petitioners on the basis that it does not go far enough).<sup>75</sup>

All of the aforementioned classifications are set out in Table 3-1 below, but in practice, it turns out that the agency, legislation, type of regulatory action (pro- or antienvironment) and the identity of the petitioner(s) do not appear to have any significant correlation to the court's approach to judicial review. From an analytical point of view, the most interesting categorisation relates to the type of challenge.

<sup>&</sup>lt;sup>75</sup> See e.g. Center for Biological Diversity v National Highway Traffic Safety Administration 508 F 3d 508 (9th Cir 2007), discussed in Section 3.5.3 below. My sample does not contain any instances of 'anti-environment' action being challenged by industry petitioners.

### Table 3-1

Case (year)	Agency	Legislation	Type of regu- latory action	Petitioners	Type of challenge
California by Brown v Watt (1981) <sup>76</sup>	Department of the Interior	Outer Continental Shelf Lands Act	Anti-environment	Environmental	Scope
Natural Resources Defense Council v Hodel (1988) <sup>77</sup>	Department of the Interior	Outer Continental Shelf Lands Act	Anti-environment	Environmental	Methodology
New York v Reilly (1992) <sup>78</sup>	Environmental Protection Agency	Clean Air Act	Anti-environment	Environmental	Scope
Northwest Environmental Advocates v National Marine Fisheries Service (2006) <sup>79</sup>	Army Corps of Engineers	National Environmental Policy Act	Anti-environment	Environmental	Scope
Center for Biological Diversity v National Highway Traffic Safety Administration (2007) <sup>80</sup>	National Highway Traffic Safety Administration	Energy Policy and Conservation Act	Pro-environment	Environmental	Scope
Entergy Corp. v Riverkeeper, Inc. (2009) <sup>81</sup>	Environmental Protection Agency	Clean Water Act	Pro-environment	Environmental and industry	Scope
Webster v US Department of Agriculture (2012) <sup>82</sup>	Department of Agriculture	National Environmental Policy Act	Pro-environment	Industry	Scope
Ctr for Sustainable Econ v Jewell (2015) <sup>83</sup>	Department of the Interior	Outer Continental Shelf Lands Act	Anti-environment	Environmental	Scope and methodology
Zero Zone, Inc. v United States DOE (2016) <sup>84</sup>	Department of Energy	Energy Policy and Conservation Act	Pro-environment	Industry	Scope and methodology

- <sup>76</sup> 668 F 2d 1290 (DC Cir 1981).
- <sup>77</sup> 865 F 2d 288 (DC Cir 1988).
- <sup>78</sup> 969 F 2d 1147 (DC Cir 1992).
- <sup>79</sup> 460 F 3d 1125 (9th Cir 2006).
- <sup>80</sup> 508 F 3d 508 (9th Cir 2007).
- <sup>81</sup> 556 US 208 (2009).
- $^{82}$   $\,$  685 F 3d 411 (4th Cir 2012).
- <sup>83</sup> 779 F 3d 588 (DC Cir 2015).
- <sup>84</sup> 832 F 3d 654 (7th Cir 2016).

While authorisation challenges to regulatory CBA involve a 'step zero' decision on whether to value or not to value,<sup>85</sup> the adequacy challenges in my sample involve either (or both) of the other two valuation choices,<sup>86</sup> namely *what* values to measure (the scope of the valuation exercise), and *how* to measure them (methodology choice). These categories roughly correspond to what Cecot and Viscusi respectively term 'scope challenges'<sup>87</sup> and challenges to 'methodology or assumptions' – I use this terminology in the table above and in the rest of chapter.<sup>88</sup> (Cecot and Viscusi define scope challenges as those where the petitioners challenged 'whether the agency sufficiently considered all reasonable – or statutorily mandated – factors' in its CBA,<sup>89</sup> that is, allegations of under-inclusion, but I also include the converse, that is, allegations of *over*-inclusion.<sup>90</sup>)

#### 3.5.3 Scope challenges: successful

In my sample, there are only two cases where an adequacy challenge pertaining to environmental valuation was successful, both of which are scope challenges.<sup>91</sup>

In *California by Brown v Watt ('Watt')*,<sup>92</sup> petitioners (States and environmental groups) challenged a program for the leasing of oil and gas drilling rights on the outer continental shelf ('OCS').<sup>93</sup> There was an authorisation challenge, which was unsuccessful, and an adequacy (scope) challenge, which was successful.

<sup>91</sup> This is arguably not mere coincidence; see Section 3.6 below.

<sup>93</sup> ibid 1294.

<sup>&</sup>lt;sup>85</sup> See Chapter 1.

<sup>&</sup>lt;sup>86</sup> See Chapter 2.

<sup>&</sup>lt;sup>87</sup> Cecot and Viscusi (n 1) 576–77.

<sup>&</sup>lt;sup>88</sup> ibid 592. Cecot and Viscusi's third subcategory – whether the agency provided sufficient explanation and opportunity for notice and comment – is not directly relevant, since in this instance we are concerned with substantive judicial review of valuation *per se*, rather than procedural requirements.

<sup>&</sup>lt;sup>89</sup> ibid 577.

<sup>&</sup>lt;sup>90</sup> See Webster (n 82, challenging the inclusion of incidental recreation) and Zero Zone (n 84, challenging the inclusion of environmental factors, long-term benefits and global benefits).

<sup>&</sup>lt;sup>92</sup> Watt (n 76).

The leasing program in question was prepared by the Secretary of the Interior under the Outer Continental Shelf Lands Act ('OCSLA'), which requires the Secretary to 'select the timing and location of leasing, to the maximum extent practicable, so as to obtain a *proper balance* between the potential for environmental damage, the potential for the discovery of oil and gas, and the potential for adverse impact on the coastal zone.'<sup>94</sup>

The Secretary interpreted the provision to mean that 'if the anticipated benefits [of leasing] outweigh the anticipated costs for an area', then the "proper balance" ... is to schedule the area for leasing consideration'.<sup>95</sup> Petitioners' authorisation challenge disputed this interpretation, on the basis that 'it allows even significant environmental costs and coastal zone impacts to be overridden'.<sup>96</sup> However the court held that 'this is precisely what the Act intends, provided that the potential oil and gas benefits exceed those potential costs'.<sup>97</sup> Nor, according to the court, was it 'obvious either in theory or in practice that the Secretary's interpretation of the Act will invariably weigh benefits more heavily than costs'.<sup>98</sup>

The court was, however, more sympathetic to the petitioners' adequacy challenge. Petitioners argued that the only environmental costs considered by the Secretary were those relating to oil spill damage and cleanup, and that economic losses suffered by tourism, fishing, and other OCS-related activities in the event of an oil spill were ignored.<sup>99</sup> The court agreed, noting that economic losses to activities such as tourism and fishing:

> are necessarily speculative to a considerable degree. But, unlike some environmental costs, damage to tourism, fishing, and the like is not inherently insusceptible of quantitative analysis. No reason

<sup>&</sup>lt;sup>94</sup> 43 USC 1331 et seq, 1344(a)(3) (emphasis added).

<sup>&</sup>lt;sup>95</sup> Proposed Final OCS Oil & Gas Leasing Schedule (April 1980) (Compliance with Section 18 of the OCS Lands Act, as amended), App. at 1822.

<sup>&</sup>lt;sup>96</sup> Watt (n 92) 1318.

<sup>&</sup>lt;sup>97</sup> ibid.

<sup>&</sup>lt;sup>98</sup> ibid.

<sup>&</sup>lt;sup>99</sup> ibid 1319.

appears why such estimates cannot be made, and the Secretary offers no satisfactory excuse for the failure to make them.<sup>100</sup>

A related challenge, that the Secretary underestimated the damage and cleanup cost of a major oil spill, was rejected by the court, holding that '[a]lthough we might pick another number to represent the damage and cleanup cost of a predicted oil spill, we cannot say the selection of \$ 100 million was a clear error of judgment'.<sup>101</sup>

The court went on to hold that the Secretary erred in failing, *inter alia*, 'to strike a proper balance incorporating environmental and coastal zone factors [and] to quantify environmental costs to the extent they are quantifiable',<sup>102</sup> and remanded the program for reconsideration and public comment.<sup>103</sup>

The second case in this category also involved an unsuccessful authorisation challenge and a successful adequacy (scope) challenge by States and environmental petitioners. *Center for Biological Diversity v National Highway Traffic Safety Administration ('CBD')*<sup>104</sup> involved a rule issued by the National Highway Traffic Safety Administration ('NHTSA') setting average fuel economy standards for light trucks.<sup>105</sup> The rule was issued under the Energy Policy and Conservation Act ('EPCA'), which directs the Secretary of Transportation to set fuel economy standards for non-passenger automobiles at 'the *maximum feasible* average fuel economy level that the Secretary decides the manufacturers can achieve in that model year'.<sup>106</sup> The EPCA also sets out four factors to be considered in deciding the maximum feasible

<sup>&</sup>lt;sup>100</sup> ibid. The implication, in this passage, that some environmental costs are 'inherently insusceptible of quantitative analysis' is intriguing, but unfortunately there is no indication as to what types of environmental costs the court had in mind.

<sup>&</sup>lt;sup>101</sup> ibid 1320.

<sup>&</sup>lt;sup>102</sup> ibid 1325.

<sup>&</sup>lt;sup>103</sup> ibid 1326.

<sup>&</sup>lt;sup>104</sup> CBD (n 80). The decision was subsequently amended in Center for Biological Diversity v National Highway Traffic Safety Administration 538 F 3d 1172 (9th Cir 2008). However, the amendments related to a separate challenge (relating to the adequacy of the NHTSA's environmental assessment under the National Environmental Policy Act) which is not relevant for our purposes.

 <sup>&</sup>lt;sup>105</sup> Average Fuel Economy Standards for Light Trucks Model Years 2008–2011; Final Rule, 71 Fed Reg 17566 (2006), codified at 49 CFR 533.

<sup>&</sup>lt;sup>106</sup> 49 USC 32901 et seq, 32902(a) (emphasis added).

average fuel economy, namely, 'technological feasibility, economic practicability, the effect of other motor vehicle standards of the Government on fuel economy, and the need of the United States to conserve energy'.<sup>107</sup>

To determine the appropriate standard, NHTSA used 'marginal cost-benefit analysis'<sup>108</sup> – that is, it added fuel-saving technologies 'in order of lower to higher costs',<sup>109</sup> up to the point where the marginal cost of the technology equalled the marginal benefits.<sup>110</sup> Petitioners challenged the permissibility of NHTSA's use of marginal CBA (authorisation challenge), as well as the adequacy of the CBA.<sup>111</sup>

In their authorisation challenge, petitioners argued that EPCA prohibits NHTSA's use of marginal CBA in standard-setting. The court rejected the challenge, holding that EPCA 'is silent on the precise question of whether a marginal cost-benefit analysis may be used',<sup>112</sup> and that it 'neither requires nor prohibits the setting of standards at the level at which net benefits are maximized'.<sup>113</sup> However, it then went on to review the adequacy of the CBA in light of the statutory purpose of EPCA:

Whatever method it uses, NHTSA cannot set fuel economy standards that are contrary to Congress's purpose in enacting the EPCA – energy conservation. We must still review whether NHTSA's balancing of the statutory factors is arbitrary and capricious.<sup>114</sup>

The petitioners' adequacy challenge was based on the NHTSA's failure to monetise the benefits of greenhouse gas emissions reduction.<sup>115</sup> In its regulatory impact

<sup>&</sup>lt;sup>107</sup> ibid 32902(f).

<sup>&</sup>lt;sup>108</sup> Fuel Economy Final Rule (n 105) 17598.

<sup>&</sup>lt;sup>109</sup> ibid 17582.

<sup>&</sup>lt;sup>110</sup> ibid 17645.

<sup>&</sup>lt;sup>111</sup> CBD (n 80) 513.

<sup>&</sup>lt;sup>112</sup> ibid 530.

<sup>&</sup>lt;sup>113</sup> ibid 529–30, quoting (and agreeing with) Light Trucks, Average Fuel Economy; Model Years 2008–2011; Proposed Rules, 70 Fed Reg 51415 (2005) 51435.

<sup>&</sup>lt;sup>114</sup> ibid 530.

<sup>&</sup>lt;sup>115</sup> The petitioners also argued (unsuccessfully) that the NHTSA's 'calculation of the costs and benefits of alternative fuel economy standards fails to evaluate properly the benefit
analysis, the NHTSA examined the costs and benefits of the reformed standards, and monetised specific benefits including fuel savings for individual consumers due to increased mileage, reduced economic externalities of importing and consuming petroleum, and reductions in criteria pollutants (SOx, NOx and particulate matter).<sup>116</sup> However, the NHTSA assigned a *zero* value to the reduced emissions of CO<sub>2</sub> and other greenhouse gases. In the face of environmental groups' comments, supported by peer reviewed studies, urging the NHTSA to take this benefit into account, the NHTSA justified its decision as follows:

The agency continues to view the value of reducing emissions of CO<sub>2</sub> and other greenhouse gases as too uncertain to support their explicit valuation and inclusion among the savings in environmental externalities from reducing gasoline production and use. There is extremely wide variation in published estimates ... of economic benefits from reducing emissions of greenhouse gases.<sup>117</sup>

The NHTSA also claimed that 'commenters did not reliably demonstrate that the unmonetized benefits ... would alter the agency's assessment'.<sup>118</sup>

The court disagreed, and held that NHTSA's reasoning was arbitrary and capricious.<sup>119</sup> It noted that NHTSA had overstated the variation in estimates.<sup>120</sup> In any case, while estimates may vary, 'it is possible to monetize the benefit of carbon emissions reduction' and that value 'is certainly not zero'.<sup>121</sup> The court also pointed

of vehicle weight reduction'. ibid 513. This too is an adequacy challenge, but it relates to failure to consider alternatives rather than valuation, and as such falls outside the scope of this chapter.

<sup>&</sup>lt;sup>116</sup> NHTSA, 'Final Regulatory Impact Analysis, Corporate Average Fuel Economy and CAFE Reform for MY 2008-2011 Light Trucks' (2006) ch VIII.

<sup>&</sup>lt;sup>117</sup> Fuel Economy Final Rule (n 105) 17638.

<sup>&</sup>lt;sup>118</sup> ibid.

<sup>&</sup>lt;sup>119</sup> *CBD* (n 80) 533.

<sup>&</sup>lt;sup>120</sup> ibid.

<sup>&</sup>lt;sup>121</sup> ibid.

out that the NHTSA had 'monetized other uncertain benefits, such as the reduction of criteria pollutants, crash, noise, and congestion costs'.<sup>122</sup>

On the NHTSA's second argument, i.e. that the agency's assessment would be unaltered even if the emissions reduction benefits were monetised and included, the court held that the evidence showed otherwise, citing the Union of Concerned Scientists' comments that such inclusion 'could increase the 2011 targets by an average of 0.4–1.1 mpg'.<sup>123</sup>

In sum, the court endorsed the use of CBA *per se* (rejecting the authorisation challenge), but not the undervaluing of benefits (allowing the adequacy challenge):

Even if NHTSA may use a cost-benefit analysis to determine the 'maximum feasible' fuel economy standard, it cannot put a thumb on the scale by undervaluing the benefits and overvaluing the costs of more stringent standards. ... Under this methodology, the values that NHTSA assigns to benefits are critical. Yet, NHTSA assigned no value to the most significant benefit of more stringent [fuel economy] standards: reduction in carbon emissions.<sup>124</sup>

On that basis, the court remanded the case to the NHTSA, directing it to promulgate new standards which include a monetised value for the benefit of carbon emissions.<sup>125</sup>

<sup>&</sup>lt;sup>122</sup> ibid 534. In fact, while the NHTSA considered the reduction of criteria pollutants as a benefit, crash, noise, and congestion costs were predicted to *increase* due to the 'rebound effect', and were therefore treated as potential *costs*. FRIA (n 116) VIII-54–58. The 'rebound effect' refers to the prediction that the higher fuel economy standards would result in greater mileage, that is, a lower cost per mile of driving. 'In response, consumers would increase the number of miles they drive.' ibid VIII-45–46. Nevertheless, the court's logic still holds, insofar as the NHTSA did monetise intangible *costs* such as crash, noise, and congestion.

<sup>&</sup>lt;sup>123</sup> CBD (n 80) 535, citing Union of Concerned Scientists – Comments, NHTSA Docket No 2005-22223-1978 (25 Nov 2005) 16.

<sup>&</sup>lt;sup>124</sup> ibid 531.

<sup>&</sup>lt;sup>125</sup> ibid 558. Certain other aspects of the rule-making process, not relevant for our purposes, were also held to have been arbitrary and capricious.

### 3.5.4 Scope challenges: unsuccessful

In *New York v Reilly* ('*Reilly*'),<sup>126</sup> petitioner States challenged the EPA's decision *not* to promulgate two environmentally-friendly rule provisions which would have (a) required incinerator operators to separate certain types of waste before incineration ('separation rules'), and (b) placed a ban on the incineration of lead-acid vehicle batteries ('battery rules').

The adequacy (scope) challenge related to the separation rules, in particular EPA's conclusion that the air-quality benefits were relatively small and difficulty to reliably quantify,<sup>127</sup> and that the record was inconclusive as to whether the 'nonair benefits' (including health and environmental impacts) would materialise.<sup>128</sup> On both points, the court held that EPA's conclusions were adequately supported by the record and affirmed its decision,<sup>129</sup> noting that the court is 'extremely deferential to administrative agencies in cases involving technical rulemaking decisions'.<sup>130</sup>

The challenge to non-promulgation of battery rules did not relate to quantification *per se,* but here the court took issue with the EPA's approach whereby it recognised that a ban would achieve air benefits but decided not to impose one, without citing any nonair or other economic benefits to justify this omission.<sup>131</sup> The court therefore remanded that portion of the rules to the EPA 'for more reasoned decisionmaking'.<sup>132</sup>

In Northwest Environmental Advocates v National Marine Fisheries Service ('NWEA'),<sup>133</sup> an environmental group challenged the adequacy of an environmental impact statement ('EIS') prepared by the US Army Corps of Engineers under the National

<sup>130</sup> ibid 1152.

<sup>132</sup> ibid.

<sup>&</sup>lt;sup>126</sup> *Reilly* (n 78).

<sup>&</sup>lt;sup>127</sup> 56 Fed Reg 5496.

<sup>&</sup>lt;sup>128</sup> ibid 5497.

<sup>&</sup>lt;sup>129</sup> *Reilly* (n 78) 1151.

<sup>&</sup>lt;sup>131</sup> ibid 1153.

<sup>&</sup>lt;sup>133</sup> 460 F 3d 1125 (9th Cir 2006).

Environmental Policy Act ('NEPA'),<sup>134</sup> in connection with a project to deepen the Columbia River navigation channel.

Northwest Environmental Advocates argued that the EIS failed to take the requisite 'hard look' at the various impacts of the project<sup>135</sup> and challenged, *inter alia*, the Corps' economic analysis whereby the Corps estimated the project's benefit-cost ratio at \$1.66 to the dollar.<sup>136</sup> In particular, NWEA argued that the Corps violated NEPA by failing to consider the cumulative impacts of the project, including costs associated with jetty deterioration and coastal erosion.<sup>137</sup> The majority acknowledged that '[i]naccurate economic information may defeat the purpose of an EIS',<sup>138</sup> but held that in this instance, the Corps 'took a hard look at these substantive issues', and that its 'extensive economic analyses' satisfied the NEPA requirements.<sup>139</sup> This conclusion was supported by the fact that the Corps had hired two independent panels of experts to review its economic analyses of costs and benefits.<sup>140</sup>

*Webster v US Department of Agriculture* (*'Webster'*)<sup>141</sup> involved the proposed construction of a dam by the Natural Resources Conservation Service (*'NRCS'*). The Appellants, seven individuals, who believed that their land would be adversely affected by the construction, contended that NRCS failed to comply with NEPA.

<sup>&</sup>lt;sup>134</sup> 42 USCS 4321 et seq.

<sup>&</sup>lt;sup>135</sup> NWEA (n 133) 1128.

<sup>&</sup>lt;sup>136</sup> ibid 1147.

<sup>&</sup>lt;sup>137</sup> ibid 1143.

<sup>&</sup>lt;sup>138</sup> ibid, quoting NRDC v United States Forest Service 421 F 3d 797 (9th Cir 2005) 811.

<sup>&</sup>lt;sup>139</sup> ibid. See however Judge Fletcher's dissent, asserting that the Corps' CBA was 'deeply flawed' in that, on the one hand, it underestimated the project's costs by failing to consider several factors such as coastal and jetty erosion, while on the other, it overstated the project's economic benefits. (ibid 1146). He concluded:

It is true, we are not permitted to substitute our judgment for the reasoned decision of the agency. Neither, however, are we permitted to rubber-stamp the agency's decision of what factors must be considered and what factors need not be considered without taking a detailed look at whether the agency's reasoning is sound. (ibid 1162).

<sup>&</sup>lt;sup>140</sup> ibid 1144.

<sup>&</sup>lt;sup>141</sup> Webster (n 82).

One of the arguments put forward by appellants was that NRCS 'included a misleading and inaccurate cost-benefit analysis'.<sup>142</sup> This argument, in turn, included a scope challenge: petitioners objected to the fact that NRCS included over \$900,000 as incidental recreation benefits, even though it had earlier removed recreation as a purpose of the dam.<sup>143</sup> However, the court was satisfied with NRCS's explanation that, while recreation was no longer a stated purpose for that dam, 'incidental recreation, such as fishing, bird watching, boating, and hiking, would still occur', and there was nothing to suggest that the estimated benefit from such recreation was inflated or otherwise erroneous.<sup>144</sup>

Finally, *Entergy*<sup>145</sup> involved a challenge to a final rule promulgated by the EPA relating to cooling water intake structures for large, existing power plants.<sup>146</sup> Through these intake structures, power plants draw in water from water-bodies in order to cool their facilities, and in the process trap or suck in aquatic organisms.<sup>147</sup> The rule in question was promulgated under section 316(b) of the Clean Water Act, which requires EPA to set standards such that 'cooling water intake structures reflect the best technology available for minimizing adverse environmental impact'.<sup>148</sup>

The EPA's rule specified the extent to which facilities must reduce fish and shellfish mortality (in percentage terms).<sup>149</sup> The agency considered but did not mandate the adoption of 'closed-cycle recirculating systems' which would reduce mortalities further, but at significantly greater cost.<sup>150</sup>

<sup>&</sup>lt;sup>142</sup> ibid 429.

<sup>&</sup>lt;sup>143</sup> ibid 430.

<sup>&</sup>lt;sup>144</sup> ibid 431.

<sup>&</sup>lt;sup>145</sup> *Entergy* (n 81).

<sup>&</sup>lt;sup>146</sup> National Pollutant Discharge Elimination System – Final Regulations to Establish Requirements for Cooling Water Intake Structures at Phase II Existing Facilities; Final Rule, 69 Fed Reg 41575 (2004), codified at 40 CFR 9, § 122–25.

<sup>&</sup>lt;sup>147</sup> Entergy (n 81) 208.

<sup>&</sup>lt;sup>148</sup> 33 USC 1251 et seq, 1326(b).

<sup>&</sup>lt;sup>149</sup> 40 CFR 125.94(b)(1)–(2).

<sup>&</sup>lt;sup>150</sup> Intake Structures Final Rule (n 146) 41601, 41605, 41666.

The rule was challenged by States and environmental groups on the one hand, and by industry petitioners on the other – first in the Second Circuit,<sup>151</sup> and then, on appeal, in the Supreme Court. The Second Circuit upheld the environmental petitioners' authorisation challenge, holding that section 316(b) of the Clean Water Act does not authorise the EPA to determine the best technology available on the basis of CBA.<sup>152</sup>

Industry petitioners had also raised an adequacy (scope) challenge against the EPA's inclusion of qualitative non-use benefits in CBA.<sup>153</sup> The Second Circuit duly noted that the rule must pass both the *Chevron* test (on permissibility of CBA)<sup>154</sup> and the APA 'arbitrary and capricious' test (on adequacy),<sup>155</sup> and explicitly referred to the possibility that the EPA's analysis may not have met the adequacy threshold under the APA.<sup>156</sup> However, the Second Circuit did not reach the adequacy challenge because it held that CBA was in any case impermissible under the statute.<sup>157</sup>

On appeal, the Supreme Court reversed the Second Circuit's decision with respect to the authorisation challenge: by a narrow 5–4 majority, it held that the EPA 'permissibly relied on cost-benefit analysis in setting the national performance standards'.<sup>158</sup> Interestingly, the Supreme Court also did not consider the adequacy

<sup>&</sup>lt;sup>151</sup> Riverkeeper, Inc. v United States EPA 475 F 3d 83 (2nd Cir 2007).

<sup>&</sup>lt;sup>152</sup> ibid 101.

<sup>&</sup>lt;sup>153</sup> ibid 96.

<sup>&</sup>lt;sup>154</sup> On the *Chevron* test, see n 70 above.

<sup>&</sup>lt;sup>155</sup> ibid 95.

<sup>&</sup>lt;sup>156</sup> 'It may also be that the EPA misunderstood or misapplied cost-effectiveness analysis. If so, its decision was arbitrary and capricious because the Agency relied on factors Congress has not intended it to consider.' ibid 105 (distinguishing between CBA, which the Second Circuit held is not permitted under the Clean Water Act, and costeffectiveness analysis, which is).

<sup>&</sup>lt;sup>157</sup> In the event, the Second Circuit found that based on the record, it was 'impossible to tell' whether the EPA relied on CBA, and remanded to the EPA for clarification. ibid 104–05.

<sup>&</sup>lt;sup>158</sup> Entergy (n 81) 226.

challenge because the certiorari was expressly limited to the authorisation challenge.<sup>159</sup>

Nevertheless, the question of the CBA's adequacy entered, so to speak, through the back-door, in Justice Stevens' dissent (in which Justices Souter and Ginsburg joined).<sup>160</sup> Like the Second Circuit, Justice Stevens took the position that section 316(b) of the Clean Water Act prohibits the use of CBA in setting regulatory standards.<sup>161</sup> He based his argument not only on the 'structure and legislative history' of the Clean Water Act,<sup>162</sup> but on the nature of CBA itself. CBA, of course, involves the monetisation of both costs and benefits, and in Justice Stevens' view:

[b]ecause benefits can be more accurately monetized in some industries than in others, Congress typically decides whether it is appropriate for an agency to use cost-benefit analysis in crafting regulations.<sup>163</sup>

In particular, Justice Stevens argued that CBA is 'particularly controversial in the environmental context' because 'a regulation's financial costs are often more obvious and easier to quantify than its environmental benefits' and CBA 'often, if not always, yields a result that does not maximize environmental protection'.<sup>164</sup>

By way of example, he cited the very CBA that was at issue in this case. His critique is worth quoting at length:

<sup>&</sup>lt;sup>159</sup> Certiorari was limited to the following question: 'Whether Section 316(b) of the Clean Water Act ... authorizes the [EPA] to compare costs with benefits in determining "the best technology available for minimizing adverse environmental impact" at cooling water intake structures.' *Entergy Corp. v Riverkeeper, Inc.* 552 US 1309 (2008).

<sup>&</sup>lt;sup>160</sup> Entergy (n 81) 236–46.

<sup>&</sup>lt;sup>161</sup> ibid 237.

<sup>&</sup>lt;sup>162</sup> ibid 241.

<sup>&</sup>lt;sup>163</sup> ibid 238.

<sup>&</sup>lt;sup>164</sup> ibid 237. Likewise, Justice Breyer, concurring in part and dissenting in part, noted that 'the Act's sponsors had reasons for minimizing the EPA's investigation of, and reliance upon, cost-benefit comparisons. ... [They] feared that such analyses would emphasize easily quantifiable factors over more qualitative factors (particularly environmental factors, for example, the value of preserving nonmarketable species of fish).' ibid 232, citing Senate Report 92-414 (1972) 47.

[A]lthough the EPA estimated that water intake structures kill 3.4 billion fish and shellfish each year, the Agency struggled to calculate the value of the aquatic life that would be protected under its § 316(b) regulations. To compensate, the EPA took a shortcut: Instead of monetizing all aquatic life, the Agency counted only those species that are commercially or recreationally harvested, a tiny slice (1.8 percent to be precise) of all impacted fish and shellfish. This narrow focus in turn skewed the Agency's calculation of benefits. When the EPA attempted to value all aquatic life, the benefits measured \$735 million. But when the EPA decided to give zero value to the 98.2 percent of fish not commercially or recreationally harvested, the benefits calculation dropped dramatically - to \$83 million. The Agency acknowledged that its failure to monetize the other 98.2 percent of affected species 'could result in serious misallocation of resources,' because its 'comparison of complete costs and incomplete benefits does not provide an accurate picture of net benefits to society.'165

Thus, the adequacy of the CBA *was* called into question in *Entergy*, but only in the dissent, and only as an illustration of Justice Stevens' wider point that CBA is more problematic in the context of environmental regulation, and hence should not be presumed to be permitted where a provision is silent on the subject.<sup>166</sup> Nevertheless, the dissent is revealing in two important respects. *First*, it suggests that *if* the CBA had been subjected to an adequacy (scope) challenge by environmental petitioners on the basis that the EPA seriously undervalued aquatic life, Justice Stevens, Souter and Ginsburg would have certainly been sympathetic to that challenge, and given the relatively obvious nature of the omission, possibly other members of the bench too. *Second*, in its critique of the EPA's valuation strategy and its recognition of non-commercial, non-recreational values, it demonstrates considerable economic sophistication – a point I return to in Chapter 8.

<sup>&</sup>lt;sup>165</sup> Entergy (n 81) 237–38, citing EPA, 'Economic and Benefits Analysis for the Proposed Section 316(b) Phase II Existing Facilities Rule' (2002) EPA-821-R-02-001, and EPA, 'Economic and Benefits Analysis for the Final Section 316(b) Phase II Existing Facilities Rule' (2004) EPA-821-R-04-005 (citations omitted).

<sup>&</sup>lt;sup>166</sup> 'Studied silence ... can be as much a prohibition as an explicit "no."' Entergy (n 81) 239.

## 3.5.5 Scope and methodology challenges

Two cases in my sample involve both scope and methodology challenges. Like *Watt*, *Ctr for Sustainable Econ v Jewell ('CSE')*<sup>167</sup> involved a challenge to a proposed leasing programmes for OCS resource exploration and development. The petitioner, Center for Sustainable Economy ('CSE'), argued that the economic analysis by the Department of the Interior ('DOI') violated OCSLA inasmuch as it failed 'properly to consider environmental and market effects ... and arbitrarily and irrationally [failed] to quantify many of the Program's costs and benefits.'<sup>168</sup>

Two of the OCSLA challenges are relevant for our purposes. The first was a scope challenge: CSE objected to DOI's 'quantitative cost-benefit analysis [which] assumes that coastal and onshore impact of OCS leasing can be mitigated to zero'.<sup>169</sup> CSE contended that assigning zero cost was irrational, while DOI responded that it considered such impacts qualitatively while performing the balancing exercise.<sup>170</sup> Unfortunately for CSE, the court held that CSE had forfeited this claim by failing to give DOI fair notice of its objection.<sup>171</sup> If this challenge had been considered on merits, it is likely that the court would have found in CSE's favour; the fact pattern is similar to that in *CBD* where the NHTSA assigned zero value to the benefits of emissions reduction and, as in *CBD*, it could be argued that coastal and onshore impacts are no more uncertain than various other uncertain costs and benefits which agencies nevertheless routinely monetise.

The second challenge related to methodology. CSE challenged the 'replacement-cost methodology' employed by DOI in its CBA.<sup>172</sup> The approach adopted by DOI was to seek to quantify environmental costs (detriment to air quality and ecology) and social costs such (including recreation, property values and commercial fishing) 'that might

<sup>&</sup>lt;sup>167</sup> CSE (n 83).

<sup>&</sup>lt;sup>168</sup> ibid 593.

<sup>&</sup>lt;sup>169</sup> ibid 601.

<sup>&</sup>lt;sup>170</sup> ibid.

<sup>&</sup>lt;sup>171</sup> ibid 602.

<sup>&</sup>lt;sup>172</sup> ibid 603.

occur with new OCS production *and its most likely replacement*<sup>'.173</sup> In other words, DOI assumed that if OCS drilling were not permitted, consumers would turn to other energy sources which carry their own environmental risks and harms such as air pollution and oil-spills.<sup>174</sup> CSE argued that under OCSLA, DOI can 'only attribute costs to OCS areas if they physically arise within those areas',<sup>175</sup> so, for example, in a CBA of drilling in one OCS area, the costs of increased air pollution due to increased natural gas extraction in another part of the country should not be taken into account.<sup>176</sup> The court held, however, that DOI's approach 'was neither expressly proscribed by the statute nor unreasonable' and as such entitled to *Chevron* deference.<sup>177</sup>

In *Zero Zone, Inc. v United States DOE ('Zero Zone'),*<sup>178</sup> the most recent case in my sample, industry petitioners challenged rules aimed at improving the energy efficiency of commercial refrigeration equipment.<sup>179</sup> The rules were issued by the Department of Energy ('DOE') under the EPCA, which provides that standards must be 'economically justified'.<sup>180</sup> DOE's analysis concluded that the rules would impose costs of \$93.9–165 million on manufacturers, and a produce a net benefit of \$4.93–11.74 billion to consumers due to lower energy use.<sup>181</sup>

In determining whether the rule was 'economically justified', DOE considered the benefits to consumers as well as the rule's environmental benefits – in particular the estimated benefits of greenhouse gas reduction, which the DOE monetised using the Social Cost of Carbon ('SCC').<sup>182</sup> The petitioners argued that the EPCA does not allow DOE to consider environmental factors (a scope challenge) and, in the alternative,

<sup>&</sup>lt;sup>173</sup> ibid.

<sup>&</sup>lt;sup>174</sup> ibid 603–04.

<sup>&</sup>lt;sup>175</sup> ibid 604.

<sup>&</sup>lt;sup>176</sup> ibid 605.

<sup>&</sup>lt;sup>177</sup> ibid. On the *Chevron* test, see n 70 above.

<sup>&</sup>lt;sup>178</sup> Zero Zone (n 84).

<sup>&</sup>lt;sup>179</sup> 79 Fed Reg 17726 (2014) and 79 Fed Reg 22278 (2014).

<sup>&</sup>lt;sup>180</sup> 42 USC 6201 et seq, 6295(o)(2)(A).

<sup>&</sup>lt;sup>181</sup> Zero Zone (n 84) 675.

<sup>&</sup>lt;sup>182</sup> 79 Fed Reg 17777. The DOE relied on 'a set of values for the SCC that was developed by a Federal interagency process'. ibid.

that the DOE's analysis of the SCC was arbitrary and capricious (a methodology challenge).<sup>183</sup>

On the first point, the court acknowledged that DOE's decision would indeed be arbitrary and capricious if it 'relied on factors which Congress had not intended it to consider'.<sup>184</sup> However, given that the EPCA specifically requires DOE to consider 'the need for national energy ... conservation',<sup>185</sup> the court held that in a CBA of an energy conservation measure, 'the expected reduction in environmental costs needs to be taken into account' and in particular, that 'Congress intended that DOE have the authority under the EPCA to consider the reduction in SCC'.<sup>186</sup>

The petitioners' 'arbitrary and capricious' argument was based, *inter alia*, on claims that 'the inputs to the models were not peer reviewed' and that 'variables based on problems like sea level rise, were determined in an arbitrary manner'.<sup>187</sup> However, the court found that the DOE's response was satisfactory, and that its 'determination of SCC was neither arbitrary nor capricious'.<sup>188</sup>

Besides the SCC-related challenges, the petitioners also put forward two additional scope challenges. First, they argued that DOE acted arbitrarily in ignoring indirect *costs* such as 'long-term effects on displaced workers', but considering 'indirect *benefits* like carbon reduction over hundreds of years'.<sup>189</sup> However, the DOE did so on the basis that in the labour market, in long-run equilibrium there would be no net effect on total employment, whereas greenhouse gas reductions would have long-

<sup>&</sup>lt;sup>183</sup> Zero Zone (n 84) 677.

<sup>&</sup>lt;sup>184</sup> ibid.

<sup>&</sup>lt;sup>185</sup> 42 USC 6295(o)(2)(B)(i)(VI). In an interesting aside, the court noted that '[e]nvironmental benefits have an economic impact', and therefore DOE 'probably also had the authority to consider environmental benefits' under 42 USC 6295(o)(2)(B)(i)(I), which allows the DOE to consider 'the economic impact of the standard'. *Zero Zone* (n 84) 677.

<sup>&</sup>lt;sup>186</sup> ibid.

<sup>&</sup>lt;sup>187</sup> ibid 678.

<sup>&</sup>lt;sup>188</sup> ibid 678–79.

<sup>&</sup>lt;sup>189</sup> ibid 679.

term effects on the environment.<sup>190</sup> The court held that while petitioners may disagree with the merits of this conclusion, it is neither arbitrary nor capricious.<sup>191</sup>

Second, petitioners argued that the DOE arbitrarily considered the global *benefits* to the environment but only the *national* costs. The DOE addressed this already in the Final Rule, by reference to 'the distinctive nature of the climate change problem' which 'involves a global externality' and 'presents a problem that the United States alone cannot solve'.<sup>192</sup> The court noted that petitioners point to no corresponding global costs, and DOE therefore acted reasonably in this regard also. The petitions for review were denied in their entirety.

### 3.5.6 Methodology challenges

The final case in my sample involves methodology challenges only. In *Natural Resources Defense Council v Hodel* ('*NRDC*'),<sup>193</sup> petitioners (various environmental groups and states) challenged an offshore oil and gas leasing programme proposed by the DOI under OCSLA. They challenged, among others, the DOI's calculation of 'net social value' in its CBA of the programme.<sup>194</sup> Three challenges are relevant for our purposes, all alleging that the DOI undervalued environmental costs. All three were rejected by the court.

*First,* petitioners pointed to a study estimating the value of California's OCS biological resources to argue that DOI had 'grossly undervalued' those resources. The court was satisfied with the DOI's response that the study in question estimated the *total* value of all OCS resources, not how much would be lost as a result of OCS leasing.<sup>195</sup> *Second*, petitioners argued that DOI's estimates of air quality costs were too low, and that it should instead have used the costs of mitigating the impact on air

<sup>&</sup>lt;sup>190</sup> ibid.

<sup>&</sup>lt;sup>191</sup> ibid.

<sup>&</sup>lt;sup>192</sup> 79 Fed Reg 17779.

<sup>&</sup>lt;sup>193</sup> NRDC (n 77).

<sup>&</sup>lt;sup>194</sup> ibid 306. 'Net social value is "net economic value" (the market value of expected resources less the cost of production and transportation) minus "social costs" (environmental and socio-economic costs).' ibid.

<sup>&</sup>lt;sup>195</sup> ibid 310.

quality. However, the court found that under the DOI's methodology, 'air quality costs reflect the net cost of emissions *after* mitigation' and mitigation costs are therefore already taken into account.<sup>196</sup> *Third*, petitioners pointed to a study estimating the value of Louisiana wetlands, to argue that DOI undervalued wetland losses. The court found that the DOI considered this study specifically, and that it actually used *higher* estimates in its analysis.<sup>197</sup> Thus the court found that 'in each instance, the Secretary adequately explained his methodology and that his conclusions "were reasonable and supported by the record."<sup>198</sup>

### 3.6 Analysis

#### 3.6.1 *Successes and failures*

The case-law analysis reveals that, in the realm of challenges to the adequacy of environmental valuation in agency CBA, successful challenges are the exception rather than the norm. Out of the nine cases in my sample, several of which involved more than one challenge, only two specific challenges – *Watt* and *CBD*, both scope challenges – proved successful, although as I suggested above, two other challenges – one of which was held to be forfeited (*CSE*) while the other was limited by certiorari (*Entergy*) – may have been successful on merits.

Leaving aside *CSE* and *Entergy*, there is a clear contrast between the unsuccessful scope challenges (*Reilly*, *NWEA*, *Webster* and *Zero Zone*) on the one hand, and the two successful challenges (*Watt* and *CBD*) on the other. In *Reilly* and *NWEA*, both underinclusion challenges, the agency gave careful consideration to the environmental benefits (in *Reilly*) and costs (in *NWEA*) before deciding to exclude them from the CBA: in *Reilly*, the agency found that the air-quality benefits were relatively small and difficulty to reliably quantify, and that it was uncertain whether the non-air

<sup>&</sup>lt;sup>196</sup> ibid 311.

<sup>&</sup>lt;sup>197</sup> ibid.

<sup>&</sup>lt;sup>198</sup> ibid, citing *California by Brown v Watt* 712 F 2d 584 (DC Cir 1983) 606. The court held that the DOI's consideration of the cumulative impacts of the programme on migratory species (a point not directly valuation- related and therefore not relevant for this chapter) did not satisfy NEPA requirements and accordingly remanded that matter to the DOI, but denied the review petitions in all other respects.

benefits would materialise, while in *NWEA*, the majority found that the Corps took the requisite 'hard look' at the environmental impacts of the project, and was satisfied with the Corps' 'extensive economic analyses'. *Zero Zone* and *Webster* were both overinclusion challenges. In *Zero Zone*, the court held that the statute authorised the agency to consider SCC as a relevant factor in the calculation, and in *Webster*, the agency gave a persuasive explanation for including recreation costs in the CBA.

By contrast, in *Watt*, the Secretary failed to consider – and offered no reasons for failing to consider – economic losses suffered by tourism, fishing and related activities.<sup>199</sup> In *CBD*, the agency failed to monetise the benefits of greenhouse gas emissions reduction. Unlike in *Watt*, it gave reasons for its omission, but the reason – that the value is 'too uncertain' – is patently unpersuasive:<sup>200</sup> as the court noted, the benefits can certainly be monetised, and while estimates may vary, the value is certainly not zero.<sup>201</sup> Thus, courts have been generally deferential towards agency decisions on what cost and benefits to include in the analysis, stepping in only when the agency altogether fails to consider relevant costs without justification.

### 3.6.2 *Standard of review*

Much of the literature on agency CBA is concerned with the question of whether courts should be deferential or strict in their review. As I pointed out in Section 3.2.1, most authors position themselves somewhere on the deferential–strict continuum, but the point I have tried to make is that these answers miss the point. There are really two separate questions depending on the type of challenge under consideration. In case of an authorisation challenge, how closely should courts scrutinise agencies' decisions to conduct CBA? And in case of an adequacy challenge, how closely should they scrutinise the CBA itself?

The questions have a different interpretive context (the *Chevron* standard usually governs the first case, and the APA standard usually governs the second)<sup>202</sup> and a

<sup>&</sup>lt;sup>199</sup> See n 100 and accompanying text.

<sup>&</sup>lt;sup>200</sup> See n 117 and accompanying text.

<sup>&</sup>lt;sup>201</sup> See n 121 and accompanying text.

<sup>&</sup>lt;sup>202</sup> See n 70 and 71 above.

different policy context (one's response to the first question would likely be informed by the desirability of CBA as a tool of agency-decision-making, whereas in the second case the decision to rely on some form of CBA is taken for granted; the answer depends on one's views on judicial competence in evaluating agency CBA).

The first question is beyond the scope of this chapter. However, the case-law analysis shows that appellate courts have proved competent at separating legal questions from technical questions which are within the scope of agency expertise. Indeed, in cases such as *Michigan v EPA* and the *Entergy* dissent, they have recognised unquantified benefits even though they were not directly implicated.

Scholars such as Cass Sunstein,<sup>203</sup> Jacob Gersen and Adrian Vermeule<sup>204</sup> favour a deferential standard of judicial review, primarily on the basis that CBA involves technical questions which agency experts, as opposed to generalist judges, are more qualified to answer. Since CBA typically involves monetisation of costs and benefits and environmental benefits are notoriously hard to quantify, the argument for judicial deference would appear to be even stronger in the context of environmental regulation.

However, the questions at issue in adequacy challenges are not only technical or methodological – the kind that experts are arguably better equipped to address. Before dealing with methodological questions, i.e. how benefits are to be measured, the valuer must first address scope questions – determining which benefits are relevant, and this determination involves value judgments, questions of policy and statutory purpose. Indeed, sometimes the central question in an adequacy challenge can be reframed, for example, as: Was the agency required, under the governing statute, to take a particular environmental benefit or cost into account in its CBA? As an empirical matter, I showed that courts do in fact engage with these questions in the judicial review of CBA. As a normative matter, I would argue that this is how it should be.

<sup>&</sup>lt;sup>203</sup> Sunstein (n 4) 11.

<sup>&</sup>lt;sup>204</sup> Gersen and Vermeule (n 5) 1359.

Needless to say, judicial review is no panacea. Judges are generalists but not omniscient. Review can lead to regulatory slowdown 'ossification'.<sup>205</sup> It has even been suggested that agencies may 'respond to the threat of such review by hiding, not exposing, the weaknesses in their analyses.'<sup>206</sup>

However, the case law on adequacy challenges to agency CBAs, as well as empirical studies by other scholars on agency CBAs which were *not* challenged in court,<sup>207</sup> shows that agency CBAs are often not comprehensive, particularly with respect to the valuation of environmental benefits and costs, and the issues involved are not all technical questions best left to experts.

### 3.7 Conclusion

In this chapter I identified and analysed appellate court cases from 1981 to 2018 which meet the following two criteria: (a) they involve one or more adequacy challenges to an agency CBA, and (b) that challenge (or those challenges) pertains to valuation of environmental costs or benefits. I then used the valuation choices framework to categorise the case law into scope and methodology challenges – a typology which is revealing of courts' attitudes towards challenges to agency CBAs – deferential overall, but *more* deferential when it comes to methodology challenges as opposed to scope challenges. Indeed, it is probably not a coincidence that the only two successful challenges are scope challenges, and that all methodology challenges to date appear to have ended in failure.

First, non-market valuation is challenging, environmental valuation especially so. Environmental impacts of regulation – both benefits and costs – are less 'economic' and therefore harder to quantify in monetary terms than, say, impacts of financial regulation.<sup>208</sup> The empirical evidence does not suggest that agencies have always

<sup>&</sup>lt;sup>205</sup> Bull and Ellig (n 18) 812.

<sup>&</sup>lt;sup>206</sup> Coates (n 20) 1004.

<sup>&</sup>lt;sup>207</sup> Sinden (n 61); Jonathan Masur and Eric A Posner, 'Unquantified Benefits and the Problem of Regulation Under Uncertainty' (2016) 102 *Cornell Law Review* 87.

<sup>&</sup>lt;sup>208</sup> Eric A Posner and E Glen Weyl, 'Cost-Benefit Analysis of Financial Regulations: A Response to Criticisms' (2015) 124 Yale Law Journal Forum 246.

risen above these difficulties. if anything, there is strong evidence to the contrary. Sinden conducted an empirical study of 46 CBAs conducted by EPA between 2002 and 2015, and found that '[i]n thirty-six out of the forty-five CBAs ... analysed (80%), EPA described as "important," "significant," or "substantial" categories of benefits that the agency excluded as unquantifiable due to data limitations'.<sup>209</sup>

Masur and Posner's findings are, if anything, even more surprising: in a study of 'every major regulation issued by every regulatory agency from 2010 through 2013',<sup>210</sup> they found that of the 106 major rules in the dataset, '[a]agencies were able to fully quantify the regulatory costs and benefits' in only *two* ... In fifty-six of the regulations, the agency was unable to attach any number to either costs or benefits (or both).'<sup>211</sup> Further, they found that 'the unquantified benefits could be quite large',<sup>212</sup> while 'few regulations in our dataset involved unquantified costs of any great magnitude'.<sup>213</sup>

Given these findings, the success of scope challenges premised on unquantified environmental costs and benefits is hardly surprising; perhaps the bigger surprise is that such challenges are not even more commonplace.

Second, it stands to reason that generalist judges are more comfortable rejecting a CBA on the basis of non-quantification or non-inclusion of certain factors, and more deferential when it comes to relatively technical grounds such as alleged deficiencies in the agency's economic methodology or assumptions. After all, the issue of which factors are relevant to a given CBA performed pursuant to a specific statute is, in part, a matter of statutory interpretation – a point I return to in Chapter 7.

<sup>&</sup>lt;sup>209</sup> Sinden (n 61) 79.

<sup>&</sup>lt;sup>210</sup> Masur and Posner (n 207) 100.

<sup>&</sup>lt;sup>211</sup> ibid 101.

<sup>&</sup>lt;sup>212</sup> ibid 108.

<sup>&</sup>lt;sup>213</sup> ibid 116.

## Chapter 4

# Retrospective Valuation in the US: Contingent Valuation of Environmental Damage

## 4.1 Introduction

Contingent valuation ('CV' or 'CVM') is a widely-used but controversial method for valuing non-market goods such as natural resources and environmental amenities.<sup>1</sup> CV and other so-called 'stated preference methods' are described in greater detail in Chapter 2,<sup>2</sup> but to briefly recapitulate, unlike market value or revealed preference methods which measure use values only, CV can, in theory, account for both use and non-use values. Using carefully-designed questionnaires, survey participants are asked to state the maximum amount they are willing to pay ('WTP' or willingness-to-pay) for a hypothetical improvement (or to avoid a hypothetical deterioration). Alternatively, survey participants may be asked about the minimum amount they are willing to accept ('WTA' or willingness-to-accept) as compensation for a hypothetical deterioration. For example, the questionnaire might ask, 'What is the maximum you would pay each year into a Grey Whale Protection Fund to increase grey whale populations by 50%?'<sup>3</sup> By surveying a large number of respondents, the researcher can estimate what value people place on the environmental change in question.

<sup>&</sup>lt;sup>1</sup> For a detailed account of the theoretical underpinnings, methodology and applications of CV, see Anna Alberini and James R Kahn (eds), *Handbook on Contingent Valuation* (Edward Elgar 2006).

<sup>&</sup>lt;sup>2</sup> See Chapter 2, Section 2.3.3.

<sup>&</sup>lt;sup>3</sup> The example is adapted from John B Loomis and Douglas M Larson, 'Total Economic Values of Increasing Gray Whale Populations: Results from a Contingent Valuation Survey of Visitors and Households' (1994) 9 *Marine Resource Economics* 275. The actual questionnaire in that study contained additional information, such as the current population of grey whales, and precisely how the money would be used.

CV has been used to estimate the value of environmental goods ranging from porpoises<sup>4</sup> to desert lands,<sup>5</sup> and perhaps most famously in the wake of the *Exxon Valdez* oil spill in 1989.<sup>6</sup> That same year, a landmark decision by the District of Columbia Circuit Court of Appeals, *Ohio v United States Department of the Interior* (*'Ohio'*)<sup>7</sup> upheld CV as a theoretically valid method for calculating natural resource damages ('NRD'). The decision opened the floodgates of debate among legal scholars about the appropriateness of using CV for NRD assessment.

Section 4.2 surveys this literature on CV in US courts. In Section 4.3, I outline my methodology for identifying cases (from 1989 to 2018) involving the use of CV for valuation of environmental damage. These can be classified into cases involving the use of CV to measure environmental damage which caused an alleged diminution of private property value. These two categories are analysed in Section 4.4 and Section 4.5. Analysing the cases using the framework of valuation choices (outlined in Chapter 1), I identify a trend whereby general challenges against the use of CV have ended in failure (that is, the use of CV has been upheld), while specific challenges which went to merits have all been successful. In Sections 4.4.3 and 4.6, I trace how courts arrived at these outcomes, and use the idea of context-driven valuation to explain this apparent contradiction. I also suggest strategic implications for future plaintiffs seeking to use CV in environmental damage cases.

## 4.2 Literature on CV in US courts

Two articles published in 1989 (the same year as *Ohio*) were extensively cited by the *Ohio* court: both articles dealt with NRD valuation in general and, in passing, with

<sup>&</sup>lt;sup>4</sup> Yanyan Dong, *Contingent Valuation of Yangtze Finless Porpoises in Poyang Lake, China* (Springer 2013).

<sup>&</sup>lt;sup>5</sup> Jerrell Richer, 'Willingness to Pay for Desert Protection' (1995) 13(4) *Contemporary Economic Policy* 93.

<sup>&</sup>lt;sup>6</sup> Richard T Carson and others, 'Contingent Valuation and Lost Passive Use: Damages from the Exxon Valdez Oil Spill' (2003) 25(3) *Environmental and Resource Economics* 257; John Duffield, 'Nonmarket Valuation and the Courts: The Case of the *Exxon Valdez'* (1997) 15(4) *Contemporary Economic Policy* 98.

<sup>&</sup>lt;sup>7</sup> 880 F 2d 432 (DC Cir 1989), discussed in Section 4.4.1 below.

CV in particular. Anderson argued that NRD assessments should focus not on lost use or non-use values but on restoration costs,<sup>8</sup> a conclusion which would of course preclude the need for CV (since CV is primarily used for measuring non-use values). Cross, on the other hand, argued that CV, despite its shortcomings, is appropriate when restoration is impractical.<sup>9</sup>

Post-*Ohio*, Swords analysed the court's decision and certain apparent ambiguities.<sup>10</sup> But perhaps the most controversial aspect of the decision was its endorsement of CV as a theoretically valid valuation method. In 1992, at a conference in Washington DC, several prominent economists presented research casting doubts on the validity and reliability of CV.<sup>11</sup> A note in the *Harvard Law Review* argued that CV is 'fatally flawed' and should be excluded from the courtroom,<sup>12</sup> while Montesinos responded that the method should be accepted for NRD assessment until a superior alternative is developed.<sup>13</sup> The *Natural Resources Journal* devoted its Winter 1994 issue to the *Ohio* decision. The views expressed by the authors ranged from 'tempered optimism'<sup>14</sup>

<sup>&</sup>lt;sup>8</sup> Frederick R Anderson, 'Natural Resource Damages, Superfund, and the Courts' (1989) 16 *Boston College Environmental Affairs Law Review* 405, 446: 'By using estimations of restoration and replacement, reduction of lost values to suspect dollar sums becomes unnecessary. Lost use, option, and existence values are restored to the extent restoration or replacement is successful.'

<sup>&</sup>lt;sup>9</sup> Frank B Cross, 'Natural Resource Damage Valuation' (1989) 42 Vanderbilt Law Review 269, 273. 'Some significant questions remain concerning contingent valuation' (ibid 318). However, '[i]n many instances, contingent valuation provides the best method for assessing the complete economic value that individuals place on natural resource preservation' (ibid 320).

<sup>&</sup>lt;sup>10</sup> Denis Swords, 'Ohio v. United States Department of the Interior: A Contingent Step Forward for Environmentalists' (1991) 51 *Louisiana Law Review* 1347, 1350.

<sup>&</sup>lt;sup>11</sup> Revised versions of papers presented at the conference were published in Jerry A Hausman (ed), *Contingent Valuation: A Critical Assessment* (North Holland 1993).

<sup>&</sup>lt;sup>12</sup> Robert K Niewijk, Note, 'Ask a Silly Question: Contingent Valuation of Natural Resource Damages' (1992) 105 *Harvard Law Review* 1981, 2000.

<sup>&</sup>lt;sup>13</sup> Miriam Montesinos, 'It May Be Silly, but It's an Answer: The Need to Accept Contingent Valuation Methodology in Natural Resource Damage Assessments' (1999) 26 Ecology Law Quarterly 48.

<sup>&</sup>lt;sup>14</sup> David S Brookshire and Michael McKee, 'Is the Glass Half Empty, Is the Glass Half Full? Compensable Damages and the Contingent Valuation Method' (1994) 34 Natural Resources Journal 51, 51. See also KE McConnell, 'Reflections on the Ohio Decision' (1994) 34 Natural Resources Journal 93.

about the use of contingent valuation in the courtroom, to outright pessimism.<sup>15</sup> Meanwhile McManus downplayed the whole debate, taking the unconventional view that the significance of *Ohio* had been greatly overstated and that 'a rigorous critique of [contingent valuation] is therefore quixotic'.<sup>16</sup> This brief overview of literature regarding the legal validity of CV is far from exhaustive,<sup>17</sup> but as Thompson points out, a key feature of the debate is that almost all of it 'has been at a general or abstract level'.<sup>18</sup>

## 4.3 Case selection and typology

In the three decades that have elapsed since *Ohio*, a number of cases have come before US courts involving the use of CV for valuation of environmental damage. These cases present an opportunity to study how courts have responded to CV – and claims of lost non-use value – in practice.

<sup>&</sup>lt;sup>15</sup> See the lead article by Ronald G Cummings and Glenn W Harrison, 'Was the Ohio Court Well Informed in Its Assessment of the Accuracy of the Contingent Valuation Method?' (1994) 34 Natural Resources Journal 1. See also Peter Bohm, 'CVM Spells Responses to Hypothetical Questions' (1994) 34 Natural Resources Journal 37.

<sup>&</sup>lt;sup>16</sup> Robert J McManus, 'Why the Ohio Case Shouldn't Matter' (1994) 34 Natural Resources Journal 109, 109.

Other prominent contributions include Brian R Binger, Robert F Copple and Elizabeth Hoffman, 'Use of Contingent Valuation Methodology in Natural Resource Damage Assessments: Legal Fact and Economic Fiction' (1994) 89 Northwestern University Law Review 1029; Jeffrey C Dobbins, 'The Pain and Suffering of Environmental Loss: Using Contingent Valuation to Estimate Nonuse Damages' (1994) 43 Duke Law Journal 879; John M Heyde, 'Is Contingent Valuation Worth the Trouble?' (1995) 62 University of Chicago Law Review 331; Richard T Carson, 'Contingent Valuation: A Practical Alternative when Prices Aren't Available' (2012) 26(4) Journal of Economic Perspectives 27; Jerry Hausman, 'Contingent Valuation: From Dubious to Hopeless' (2012) 26(4) Journal of Economic Perspectives 43; Brian D Israel and others, 'Legal Obstacles for Contingent Valuation Methods in Environmental Litigation' in Daniel McFadden and Kenneth Train (eds), Contingent Valuation of Environmental Goods: A Comprehensive Critique (Edward Elgar 2017); Harro Maas and Andrej Svorenčík, '"Fraught with Controversy": Organizing Expertise against Contingent Valuation' (2017) 49(2) History of Political Economy 315.

<sup>&</sup>lt;sup>18</sup> Dale B Thompson, 'Valuing the Environment: Courts' Struggles with Natural Resource Damages' (2002) 32 *Environmental Law* 57, 65. A notable exception is Thompson's own article where he examined how courts have handled economic evidence offered to support NRD claims (including but not limited to CV).

I identified the cases via a set of specific searches on the Lexis 'US federal and state cases' database, using search terms such as <contingent valuation>, <contingent value method>, <CVM>, <CV study> and similar variants. I also checked relevant internal citations within cases, and cross-checked against articles relating to CV in US courts (see above). Taking *Ohio* – the most prominent US decision on CV, and the case which effectively launched the debate about its legal validity – as the starting point of my sample, I eliminated pre-1989 cases. Given my focus on environmental valuation, I also omitted cases where CV was used for non-environment-related valuation (for example, estimating damages arising from cars with a defective anti-lock braking system).<sup>19</sup>

The remaining cases, which form my sample for this chapter, can be classified into two broad categories. The first category, discussed in Section 4.4 below, consists of cases involving the use of CV for NRD assessment, under statutes such as the Comprehensive Environmental Response, Compensation and Liability Act 1980 ('CERCLA')<sup>20</sup> and the Oil Pollution Act 1990 ('OPA').<sup>21</sup> As I emphasised in Section 4.2 above, the use of CV in this context has been extensively debated in the literature, but mostly at a general level.

The second category of cases involves the use of CV to measure environmental damage which caused an alleged diminution of private property value; these cases, to my knowledge, have not been discussed in the literature at all. Legal literature on the use of CV for environmental valuation, as noted above, has focused predominantly on NRD assessment. Diminution of property value has been studied by economists and in real estate appraisal literature; this includes scholarship on valuing environmental damage to real estate in general,<sup>22</sup> as well as the use of CV in

<sup>&</sup>lt;sup>19</sup> See n 153–154 below, and accompanying text.

<sup>&</sup>lt;sup>20</sup> 42 USC 9601–75.

<sup>&</sup>lt;sup>21</sup> 33 USC 2701–2761.

<sup>&</sup>lt;sup>22</sup> See e.g. James A Chalmers and Scott A Roehr, 'Issues in the Valuation of Contaminated Property' (1993) 61(1) *Appraisal Journal* 28; William J Stack and Terri Jacobsen, 'Diminution in Property Value Arising from the Stigma of Environmental Contamination: A Phantom Injury in Search of Actual Damages' (1998) 11(2)

particular.<sup>23</sup> However, this body of work is concerned with technical issues relating to valuation *per se*; none of the articles surveyed engage with or even refer to case law on the subject.

## 4.4 NRD cases

The first category, challenges to the use of CV for NRD assessment, can be further sub-divided into two categories. The first category, which I call *general challenges*, pertains to the endorsement of CV in NRD assessment regulations. The second category (discussed in Section 4.4.2), involves *specific challenges* against the use of CV as a basis for calculating damages in particular cases.

The classification reveals an interesting trend. General challenges against the use of CV have, without exception, ended in failure, while all specific challenges which went to merits have been successful. In the remainder of this section, I show how courts arrived at these outcomes, and analyse this apparent contradiction.

### 4.4.1 *General challenges*

Three of the four general challenges to the use of CV for NRD assessment pertain to regulations issued by the United States Department of the Interior ('DOI') under CERCLA, while the fourth relates to NRD assessment rules issued by the National Oceanic and Atmospheric Administration ('NOAA') under the OPA.

*Environmental Claims Journal* 21; Jill J McCluskey, Ray G Huffaker and Gordon C Rausser, 'Neighborhood Effects and Compensation for Property Value Diminution' (2002) 24(1) *Law & Policy* 37.

<sup>&</sup>lt;sup>23</sup> See e.g. David McLean and Bill Mundy, 'The Addition of Contingent Valuation and Conjoint Analysis to the Required Body of Knowledge for the Estimation of Environmental Damages to Real Property' (1998) 1(1) *Journal of Real Estate Practice and Education* 1; Robert A Simons and Kimberly Winson-Geideman, 'Determining Market Perceptions on Contamination of Residential Property Buyers Using Contingent Valuation Surveys' (2005) 27(2) *Journal of Real Estate Research* 193; Richard J Roddewig and James D Frey, 'Testing the Reliability of Contingent Valuation in the Real Estate Marketplace' (2006) 74(3) *Appraisal Journal* 267; Clifford Lipscomb, 'Using Contingent Valuation to Measure Property Value Impacts' (2011) 29(4/5) *Journal of Property Investment & Finance* 448; Clifford Lipscomb and others, 'Contingent Valuation and Real Estate Damage Estimation' (2011) 19(2) *Journal of Real Estate Literature* 283.

CERCLA, popularly known as Superfund,<sup>24</sup> authorises government entities to recover 'damages for injury to, destruction of, or loss of natural resources, including the reasonable costs of assessing such injury, destruction, or loss resulting from such a release'.<sup>25</sup> DOI issued two sets of rules under CERCLA for the assessment of NRD 'resulting from a release of oil or a hazardous substance'.<sup>26</sup> The Type A rules specify 'standard procedures for simplified assessments requiring minimal field observation'<sup>27</sup> (intended to cover minor spills), while the Type B rules specify 'alternative protocols for conducting assessments in individual cases'<sup>28</sup> (for major spills).

*Ohio v United States Department of the Interior*<sup>29</sup> involved a challenge to the Type B rules.<sup>30</sup> Under CERCLA, an NRD assessment was entitled to a rebuttable presumption of validity if it was performed by Federal and State officials known as natural resource 'trustees', using procedures specified in the Type B rules.<sup>31</sup> Several states and environmental petitioners sought review of the regulations on the basis that they undervalued damages, while industry petitioners argued that they permitted or encouraged overstated damages. Four of the challenges are important for the purposes of this chapter.

First, state and environmental petitioners challenged the 'lesser of' rule, which provided that the measure of damages shall be 'the lesser of: restoration or replacement costs; or diminution of use values'.<sup>32</sup> The practical effect of the lesser of rule was that meant that whenever lost use value was lower than the cost of restoration, the damages award would be insufficient to pay for the costs of

<sup>&</sup>lt;sup>24</sup> See e.g. Richard L Revesz and Richard B Stewart (eds), *Analyzing Superfund: Economics, Science, and Law* (Resources for the Future 1995).

<sup>&</sup>lt;sup>25</sup> 42 USC 9607(a)(4)(C).

<sup>&</sup>lt;sup>26</sup> ibid 9651(c)(1).

<sup>&</sup>lt;sup>27</sup> ibid 9651(c)(2).

<sup>&</sup>lt;sup>28</sup> ibid. The Type A and Type B rules are codified at 43 CFR Part 11.

<sup>&</sup>lt;sup>29</sup> 880 F 2d 432 (DC Cir 1989).

<sup>&</sup>lt;sup>30</sup> 51 Fed Reg 27674 (1986), codified at 43 CFR Part 11.

<sup>&</sup>lt;sup>31</sup> CERCLA (n 20) 9607(f)(2)(C).

<sup>&</sup>lt;sup>32</sup> 43 CFR 11.35(b)(2) (1987).

restoration.<sup>33</sup> After examining the language, purpose and legislative history of CERCLA, the court invalidated the 'lesser of' rule. Restoration was 'the presumptively correct remedy for injury to natural resources'<sup>34</sup> because 'natural resources have value that is not readily measured by traditional means'.<sup>35</sup> However, use values could still be taken into account (a) where restoration is 'practically impossible' or 'where the cost of restoration becomes grossly disproportionate to the use value of the resource',<sup>36</sup> or (b) to compensate interim use value lost before restoration is complete.<sup>37</sup>

Second, environmental petitioners challenged the hierarchy of methods for determining use values, as prescribed in the regulations. Market value was at the top of the hierarchy; other methods could be used only if the market for the damaged resource was not 'reasonably competitive'.<sup>38</sup> In particular, methods such as CV, hedonic pricing or the travel cost method could only be employed to determine use values if both market value and the 'appraisal methodology'<sup>39</sup> were deemed inappropriate.<sup>40</sup>

The court held that the regulations' emphasis on market value was an unreasonable interpretation of CERCLA.<sup>41</sup>

While it is not irrational to look to market price as *one* factor in determining the use value of a resource, it is unreasonable to view market price as the *exclusive* factor, or even the predominant one.

<sup>&</sup>lt;sup>33</sup> Ohio (n 7) 441. The court noted that 'Commentators are unanimous in predicting that applying the "lesser of" rule will invariably favor the use value standard.' ibid 446 fn 13, citing Cross (n 9) 307.

<sup>&</sup>lt;sup>34</sup> *Ohio* (n 7) 456.

<sup>&</sup>lt;sup>35</sup> ibid.

<sup>&</sup>lt;sup>36</sup> ibid 443.

<sup>&</sup>lt;sup>37</sup> 'Congress intended that trustees in some cases be permitted to recover damages greater than the sum required to restore the resource. The excess would represent interim use value, the value of the lost uses from the time of the spill until the completion of the restoration project.' ibid 454.

<sup>&</sup>lt;sup>38</sup> 43 CFR 11.83(c)(1) (1987).

<sup>&</sup>lt;sup>39</sup> The 'appraisal methodology' is described in 43 CFR 11.83(c)(2) (1987).

<sup>&</sup>lt;sup>40</sup> ibid 11.83(d).

<sup>&</sup>lt;sup>41</sup> *Ohio* (n 7) 462.

From the bald eagle to the blue whale and snail darter, natural resources have values that are not fully captured by the market system.<sup>42</sup>

Therefore, the court held, use values for natural resources should be determined by 'summing up all reliably calculated use values, however measured',<sup>43</sup> so long as there is no double counting.

Third, the regulations permitted estimation of option and existence values (using CV) only in the 'extraordinary circumstances'<sup>44</sup> when a use value could not be determined at all.<sup>45</sup> Industry petitioners argued that option and existence values are non-use values, and as such are not allowable at all under CERCLA.<sup>46</sup> The court not only rejected this argument,<sup>47</sup> but it actually went further: it held that DOI's decision to limit the role of option and existence values to situations when use values could not be determined was based on an erroneous interpretation of CERCLA.<sup>48</sup>

Option and existence values may represent 'passive' use, but they nonetheless reflect utility derived by humans from a resource, and thus, *prima facie*, ought to be included in a damage assessment.<sup>49</sup>

Fourth, industry petitioners challenged the inclusion of CV in the assessment methodology. First, they argued that CV is inconsistent with common law damage assessment principles because common law does now allow recovery for speculative injuries whereas CV is 'rife with speculation, amounting to no more than ordinary public opinion polling'.<sup>50</sup> Second, they argued that CV was imprecise, untested, prone

<sup>&</sup>lt;sup>42</sup> ibid 462–63.

<sup>&</sup>lt;sup>43</sup> ibid 464.

<sup>&</sup>lt;sup>44</sup> 51 Fed Reg 27674 (1986) 27719.

<sup>&</sup>lt;sup>45</sup> 43 CFR 11.83(d)(5)(ii) (1987).

<sup>&</sup>lt;sup>46</sup> *Ohio* (n 7) 476 fn 77.

<sup>&</sup>lt;sup>47</sup> ibid.

<sup>&</sup>lt;sup>48</sup> ibid 464.

<sup>&</sup>lt;sup>49</sup> ibid.

<sup>&</sup>lt;sup>50</sup> ibid 476.

to overestimation and generally too flawed to qualify as a 'best available procedure' as required by CERCLA.<sup>51</sup>

The court rejected the challenge. It held that common law standards do not apply to CERCLA,<sup>52</sup> and also sustained DOI's conclusion that CV is a 'best available procedure'.<sup>53</sup> It found that 'DOI's decision to adopt CV was made intelligently and cautiously',<sup>54</sup> after consulting a number of studies which analysed CV, addressed various shortcomings and recommended ways to make it more reliable.<sup>55</sup> The court also addressed the industry petitioners' argument that in hypothetical surveys, respondents may overstate their willingness-to-pay: the court held that this could be addressed by 'more sophisticated questioning', and in any event, 'the risk of overestimation has not been shown to produce such egregious results as to justify judicial overruling of DOI's careful estimate of the caliber and worth of CV methodology'.<sup>56</sup>

In sum, the *Ohio* court held that (a) restoration costs (not use value, nor the lesser of the restoration costs and use value) is the presumptive measure of damages; (b) when estimation of use values is required, market value should not be the exclusive or even the predominant factor; (c) option and existence values ought to be included in a damage assessment; and (d) CV assessments are entitled to a rebuttable presumption of validity.

Of these four holdings, and using the terminology of valuation choices introduced in Chapter 1, the first three – (a) to (c) – evidently relate to scope choices; in particular, they relate to which values (restoration, use value, market value, option value, existence value...) ought to be included in the assessment. The fourth challenge, and the resulting holding pertaining to the validity of the contingent valuation method, were ostensibly about methodology – the third valuation choice. But a contrary

<sup>&</sup>lt;sup>51</sup> CERCLA (n 20) 9651(c)(2).

<sup>&</sup>lt;sup>52</sup> *Ohio* (n 7) 476.

<sup>&</sup>lt;sup>53</sup> ibid 478.

<sup>&</sup>lt;sup>54</sup> ibid 476.

<sup>&</sup>lt;sup>55</sup> ibid 477.

<sup>&</sup>lt;sup>56</sup> ibid 478.

holding – in other words, if the court had rejected the use of CV – would have effectively determined that non-use values could not be included in damage assessments, that is, the court would have ended up making a scope choice. Stated preference methods, as discussed in Chapter 2, are controversial in general, but among those methods, CV is the most widely-accepted. Since stated preference methods are the only class of valuation methods currently in existence which enable the measurement of non-use values, rejecting the use of CV (a methodology choice) effectively excludes non-use values from the damage assessment calculus (a scope choice).

*Ohio* thus established a preference for restoration costs as a measure of damages, but in certain circumstances (e.g. when restoration is infeasible, or to compensate interim use value lost before restoration is complete), it also represents a decisive endorsement of both non-use values and CV methodology.

Following the *Ohio* decision, DOI issued revised Type B rules in 1994.<sup>57</sup> These were challenged in *Kennecott Utah Copper Corp. v United States Department of the Interior* (*Kennecott'*).<sup>58</sup> The regulations authorised trustees to choose among several valuation methodologies listed therein (including CV)<sup>59</sup> while a catch-all provision stated that other cost-effective methodologies based on the public's willingness to pay are also acceptable for determining compensable value.<sup>60</sup> One of the arguments made by industry petitioners was that the catch-all provision gave too much discretion to the decision-maker and was therefore not a 'protocol' as required by CERCLA.<sup>61</sup> The court disagreed, holding that DOI's decision 'to leave some discretion to trustees,

<sup>&</sup>lt;sup>57</sup> 59 Fed Reg 14262 (1994), codified at 43 CFR Part 11.

<sup>&</sup>lt;sup>58</sup> 88 F 3d 1191 (DC Cir 1996).

<sup>&</sup>lt;sup>59</sup> 43 CFR 11.83(c)(2) (1994).

<sup>&</sup>lt;sup>60</sup> ibid 11.83(c)(3). Valuation methodologies 'based on the public's willingness to pay' would presumably be conceptually quite similar to CV – perhaps methods such as 'choice experiments' or 'contingent ranking'. CV is still the predominant stated preference method among economists and policy-makers, but choice experiments and contingent ranking are gaining in popularity. For a fuller account of these methods, see David Pearce, Giles Atkinson and Susana Mourato, *Cost-Benefit Analysis and the Environment: Recent Developments* (OECD Publishing 2006) chapter 9.

<sup>&</sup>lt;sup>61</sup> CERCLA (n 20) 9651(c)(2).

while confining their discretion in other ways, [was] based on a permissible reading of the word "protocols".<sup>62</sup> The petitioners did not specifically challenge the inclusion of CV and other WTP-based valuation methods among the permitted methodologies, but as Thompson points out, if the decision had gone the other way, DOI would arguably 'need to include more specific rules on the application of valuation techniques, which could include restrictions on the use of CVM.'<sup>63</sup> In other words, DOI would then need to elaborate on its methodology choice (use of CVM and other WTP-based valuation methods) in order to justify its scope choice (inclusion of nonuse values in the calculation of compensable value).

The Type A rules for simplified assessments<sup>64</sup> were challenged two years later, in *National Association of Manufacturers v United States Department of the Interior* ('*NAM'*)<sup>65</sup>. Petitioners argued, *inter alia*, that the computer submodels used to calculate NRD under the rules invalidly relied on 'outdated studies and information or on suspect methodologies', and were therefore not the 'best available procedures' required by CERCLA.<sup>66</sup> In upholding the rule, the court found 'no error in DoI's decision to use older studies that rely on contingent valuation or travel cost methodologies.'<sup>67</sup> The decision to use 'older, less methodologically reliable studies' to estimate losses was permissible under CERCLA when the only other choices were relying on guesswork, or excluding them from the submodels altogether.<sup>68</sup>

The evolution of petitioners' strategies from *Ohio* to *Kennecott* and *NAM* is instructive. Following the *Ohio* court's endorsement of option and existence values, petitioners shifted their focus from scope challenges to methodology challenges – from the second valuation choice to the third. Rather than arguing against option and existence values on theoretical or philosophical grounds, they challenged CVM and other

<sup>&</sup>lt;sup>62</sup> *Kennecott* (n 58) 1217.

<sup>&</sup>lt;sup>63</sup> Thompson (n 18) 69.

<sup>&</sup>lt;sup>64</sup> 61 Fed Reg 20560 (1996), codified at 43 CFR Part 11.

<sup>65 134</sup> F 3d 1095 (DC Cir 1998).

<sup>&</sup>lt;sup>66</sup> ibid 1098.

<sup>&</sup>lt;sup>67</sup> ibid 1116.

<sup>68</sup> ibid.

WTP-based valuation methodologies on practical grounds – as being too discretionary (*Kennecott*) or unreliable (*NAM*). Intuitively, and also in light of the 'best available procedures' requirement in CERCLA as well as the controversial nature of stated preference methods more generally, this seems like a more promising line of attack. If successful, given that stated preference methods are currently the only way of estimating non-use values, this strategy has the same potential outcome as a scope challenge claiming that non-use values should not be admissible at all.

The fourth general challenge involved NRD assessment rules issued by NOAA ('NOAA rules')<sup>69</sup> pursuant to the OPA. In *General Electric v United States Department* of *Commerce* ('*General Electric*')<sup>70</sup>, petitioners challenged the NOAA rules on several grounds, two of which are relevant for our purposes.

First, petitioners argued that NOAA had acted arbitrarily and capriciously by authorising the use of CV<sup>71</sup> and, in addition, by not laying down stringent standards for its use.<sup>72</sup> This, therefore, was a methodology challenge under OPA, not dissimilar to the previously discussed challenges under CERCLA.

The court acknowledged that 'contingent valuation is not without controversy'<sup>73</sup> but noted that an NOAA-commissioned special panel, which included two Nobel laureates, concluded that a rigorously-conducted CV study 'can produce estimates reliable enough to be the starting point of a judicial process of damage assessment'.<sup>74</sup> It held:

> NOAA ignored neither the panel's comments nor the criticisms of contingent valuation that the panel considered. It simply gave trustees discretion to use contingent valuation, so long as the technique produces, as required by section 990.27(a)(3) [of the

<sup>&</sup>lt;sup>69</sup> 61 Fed Reg 440 (1996), codified at 15 CFR Part 990.

<sup>&</sup>lt;sup>70</sup> 128 F 3d 767 (DC Cir 1997).

<sup>&</sup>lt;sup>71</sup> ibid 771.

<sup>&</sup>lt;sup>72</sup> ibid 773.

<sup>&</sup>lt;sup>73</sup> ibid 772.

<sup>&</sup>lt;sup>74</sup> Kenneth Arrow and others, 'Report of the NOAA Panel on Contingent Valuation' 58 Fed Reg 4601 (1983) 4610.

NOAA rules], valid and reliable results for the particular incident. ... NOAA reasonably concluded not only that prescribing standards for using all possible assessment procedures in all possible situations would be infeasible, but also that general standards, such as those included in section 990.27, can adequately ensure that trustees do not abuse their discretion.<sup>75</sup>

Second, petitioners challenged the rules to the extent they allowed recovery of lost passive-use values ('passive-use value' was used synonymously to existence value, which of course is one of several categories of non-use value).<sup>76</sup> This was a direct scope challenge under OPA, akin to the third challenge (under CERCLA) in *Ohio*. The court rejected the petitioners' argument that the OPA does not authorise recovery of passive-use values, holding that, on the contrary, 'Congress ... clearly intended to authorize trustees to recover passive-use values'.<sup>77</sup>

Thus, general challenges against the use of CV for NRD assessment – whether to do with scope or methodology - have all met with failure. However, as we shall see in the next section, *specific* challenges against the use of CV in individual NRD cases have fared significantly better.

## 4.4.2 Specific challenges

The vast majority of NRD claims – over 95 per cent according to one estimate – are settled out of court.<sup>78</sup> Bradshaw, in an important recent survey of the practice of settling NRD claims outside court, notes that '[o]nly a handful of cases have been decided on the wildly controversial topic of which economic methods may be used

<sup>&</sup>lt;sup>75</sup> *General Electric* (n 70) 771.

<sup>&</sup>lt;sup>76</sup> Passive-use value was defined as 'the value individuals place upon the existence of natural resources, even if they never plan to make active use of them. In the case of the National Seashore, for example, people who have never used the beach may nevertheless value its existence.' ibid 772. This definition clearly corresponds to the notion of 'existence value' as defined in Chapter 2 above.

<sup>&</sup>lt;sup>77</sup> ibid 778.

<sup>&</sup>lt;sup>78</sup> Karen Bradshaw, 'Settling for Natural Resource Damages' (2016) 40 Harvard Environmental Law Review 211, 214, citing 'Assessing Damages Resulting from Gulf Oil Spill: Hearing before the S. Comm. on Env't and Pub. Works' (2010) 111th Cong 8 (statement by Cynthia Dohner).

to assess damages'.<sup>79</sup> Nevertheless, my searches identified a small sample of cases (five, to be precise) where the use of CV for specific NRD assessments was challenged in court.

*Idaho v Southern Refrigerated Transport, Inc.*<sup>80</sup> ('*Southern Refrigerated*') involved a natural resource damage claim under CERCLA. The defendants' truck, which was carrying agricultural fungicide, overturned on the banks of the Little Salmon River, spilling part of its cargo into the river. Idaho sought recovery for the damage to the fish population in the Little Salmon River.

The court found that the state had suffered damages to its natural resources as a result of the defendant's negligence.<sup>81</sup> The next challenge was to quantify the damage. Idaho sought damages based on three forms of lost value: *commercial value* for all the fish lost, and *recreational* and *existence* value for the non-returning adult steelhead (i.e. fish which would have returned to fresh water to spawn if they had not been killed by the spill).<sup>82</sup> The court recognised that 'these three values do exist and would be appropriate items of damage if proved at trial'.<sup>83</sup> This, then, was a scope choice – and another general endorsement of existence value, following *Ohio* and anticipating *General Electric*.

In its valuation methodology, Idaho relied on an American Fishery Society publication to estimate the market price of the lost fish, and on benefits transfer studies to estimate recreational and existence values ('benefits transfer' is the technical term for using non-market values estimated in one context to estimate non-market values in a different context).<sup>84</sup>

83 ibid.

<sup>&</sup>lt;sup>79</sup> Bradshaw (n 78) 222.

<sup>&</sup>lt;sup>80</sup> 1991 US Dist LEXIS 1869 (D Idaho).

<sup>&</sup>lt;sup>81</sup> ibid 25.

<sup>82</sup> ibid 54.

<sup>&</sup>lt;sup>84</sup> On benefits transfer, see Kevin J Boyle and John C Bergstrom, 'Benefit Transfer Studies: Myths, Pragmatism, and Idealism' (1992) 28 Water Resources Research 657; David S Brookshire and Helen R Neill, 'Benefit Transfers: Conceptual and Empirical Issues' (1992)

Idaho's market price estimate was accepted by the court, as was its use of a preexisting travel cost study to determine the recreational value of fishing trips.85 However, Idaho's attempt to rely on a pre-existing CV study to establish existence value proved unsuccessful. The study in question had been carried out to assist Northwest Power Planning Council to determine how much individuals in the Northwest United States would be willing to pay to double the runs of steelhead and salmon in the entire Columbia River Basin (which the Salmon River drainage is part of).86 On the basis of this study, Idaho estimated an existence value of \$16.97 per nonreturning adult steelhead.<sup>87</sup> The court found that the study, based as it was on doubling the entire salmon and steelhead runs from 2.5 million to 5 million, was not persuasive for the alleged 1,688 non-returning fish.88 Therefore, 'it would be conjecture and speculation to allow damages based on this study. Idaho must prove its damages with reasonable certainty and this study does not do so.'89 The court clarified that it did not mean to suggest that the steelhead had no existence value; rather, the study by Idaho was 'legally insufficient to establish existence value in this case'.90

Thus, Idaho's scope choice – the inclusion of commercial, recreational and existence value of lost fish – was endorsed by the court (indeed, to not do so would have run contrary to *Ohio*, decided two years prior), as was its methodology choice for estimating commercial and recreational value. However, its methodology choice for estimating existence value, in particular, its use of the benefits transfer technique, was deemed unpersuasive.

<sup>28(3)</sup> *Water Resources Research* 651; Robert J Johnston, 'Choice Experiments, Site Similarity and Benefits Transfer' (2007) 38(3) *Environmental and Resource Economics* 331.

<sup>&</sup>lt;sup>85</sup> Southern Refrigerated (n 80) 56–60.

<sup>&</sup>lt;sup>86</sup> ibid 54–55.

<sup>&</sup>lt;sup>87</sup> ibid 55.

<sup>&</sup>lt;sup>88</sup> ibid 55–56.

<sup>&</sup>lt;sup>89</sup> ibid 55.

<sup>&</sup>lt;sup>90</sup> ibid 56.

Thompson<sup>91</sup> discusses an unreported case, *United States v Montrose Chemical Corp.*,<sup>92</sup> where a group of industrial companies were sued for injuries to fish and bird populations and habitats, caused by a release of DDT and other chemicals onto the Palos Verdes Shelf in Los Angeles Harbor. For the NRD assessment, NOAA contracted with a group of economists including 'the leading practitioners of the contingent valuation method' to design a CV study following best-available practices.<sup>93</sup> Unfortunately for the plaintiffs, there were 'numerous factual inconsistencies between the descriptions of the injuries offered by the CVM surveys and the actual scientific evidence offered by the [government] trustees' own [biological] experts'.<sup>94</sup> As a result, the court granted the defendants' motion to exclude the CV study.<sup>95</sup>

A third case, *Kelley ex rel Michigan v Kysor Industrial Corporation ('Kelley')*<sup>96</sup> was a motion for summary judgment, and therefore the court did not rule on the validity of the CV study in question; nevertheless, it made some interesting remarks revealing its attitude towards CV. In this case, plaintiffs were seeking damages under CERCLA against defendants who owned or operated facilities at an industrial park that was contaminated by hazardous materials. Plaintiffs proposed to value the damages using CV, but since no site-specific assessment was done, they sought to use benefits transfer (as Idaho did in *Southern Refrigerated*) to apply results from a different site.<sup>97</sup>

<sup>&</sup>lt;sup>91</sup> Thompson (n 18) 80.

<sup>92</sup> No CV 90-3122-AAH (JRx) (CD Cal 1990).

<sup>&</sup>lt;sup>93</sup> Thompson (n 18) 81.

<sup>&</sup>lt;sup>94</sup> ibid 82. For instance, the survey administrator told the respondents that peregrine falcons 'have usually not been able to hatch any of their eggs' and that their population is not increasing, but the trustees' biological experts testified that the birds had been able to hatch some eggs and their population was actually increasing. ibid 82–83, citing Memorandum of Points and Authorities in Support of Defendants' Motion to Exclude Plaintiffs' Contingent Valuation Report and Testimony Based Thereon at 4, *United States v Montrose Chemical Corp.*, No. CV 90-3122-R (CD Cal 6 March 2000) (No. 99-1769).
<sup>95</sup> ibid 84.

<sup>&</sup>lt;sup>96</sup> 1994 US Dist LEXIS 21194 (WD Mich).

<sup>&</sup>lt;sup>97</sup> Kelley (n 96) 62–63.

One of the defendants, for its part, sought partial summary judgment on the plaintiffs' valuation method. They argued that the alleged damages were 'based on speculation and, therefore, not recoverable'.<sup>98</sup> They also pointed out that the various studies reviewed by plaintiffs' expert resulted in 'widely varying values [which] demonstrates the unreliability of the approach'.<sup>99</sup>

The court denied defendant's motion for summary judgment due to lack of information, and therefore did not rule on the validity of CV and benefits transfer. However, its *obiter* remarks reveal a marked scepticism about the reliability of the proposed method:

While I agree with defendants that the CVM and benefits transfer method advanced by plaintiffs both may be too speculative, I have not been provided with sufficient factual information on the method to make a final factual determination. The credibility of the method for determining the valuation is at issue, and in light of some positive information concerning the CVM method, it would be improper to weigh the evidence at this time.<sup>100</sup>

It expressed further reservations in the following footnote:

I note, however, that the Court is of the view that the proposed method for calculating the value of the contaminated acquifer [sic] appears to be too speculative to provide a measure of damages acceptable in a court of law, *based on the nature of the CVM method* (sic) *itself* and on the fact that the benefit values calculated without reference to the values of the consumers in the [affected] area are sought to be transferred or imputed to them...<sup>101</sup>

The court did not further elaborate on this point, and although a *specific* CV study may of course be deemed unreliable for any number of reasons, the suggestion that

<sup>&</sup>lt;sup>98</sup> ibid 63.

<sup>&</sup>lt;sup>99</sup> ibid 63–64.

<sup>&</sup>lt;sup>100</sup> ibid 64.

<sup>&</sup>lt;sup>101</sup> ibid, fn 17 (emphasis supplied).

CV is, by definition, too speculative to produce a reliable measure of damages appears to contradict the appellate court decision in *Ohio*.

*Montana v Atlantic Richfield Company*<sup>102</sup> (*'Atlantic Richfield'*) arose out of a damages claim for injuries to natural resources in the Upper Clark Fork River Basin allegedly caused by the generation and release of hazardous substances. The decision in question involved a preliminary motion by the defendant company, requesting the court to preclude the State from presenting their CV survey and all related testimony at the trial stage. The motion was denied,<sup>103</sup> but in a short, one-page order, the court did not elaborate on the reasons for doing so.

A more recent case, *Oklahoma v Tyson Foods*, *Inc.*,<sup>104</sup> involved a study undertaken by the State of Oklahoma's experts to measure the natural resource damages caused by excess phosphorus from poultry waste and other sources entering the Illinois River system and Tenkiller Lake. The experts sought to estimate the total valuation, including both use and non-use values, using a CV survey.<sup>105</sup> Defendants moved to compel production of personal identification information of the survey respondents, arguing that it was needed to evaluate, among others, how interviewers actually administered the survey, and how accurately they recorded respondents' answers.<sup>106</sup>

The court held that the identification information was confidential, and the burden was on the defendants 'to show that the confidential information is sufficiently relevant and necessary to their case to outweigh the harm resulting from disclosure',<sup>107</sup> such as potentially compromising the candour of responses and introducing bias. It held that defendants had failed to discharge this burden, and defendants' motion to compel was denied.<sup>108</sup> Interestingly, the court noted that at a later stage, defendants can 'attack the CV survey by challenging the sample size,

<sup>&</sup>lt;sup>102</sup> 1997 US Dist LEXIS 24669 (D Mont).

<sup>&</sup>lt;sup>103</sup> ibid 4.

<sup>&</sup>lt;sup>104</sup> 2009 US Dist LEXIS 133533 (ND Okla).

<sup>&</sup>lt;sup>105</sup> ibid 52–53.

<sup>&</sup>lt;sup>106</sup> ibid 62.

<sup>&</sup>lt;sup>107</sup> ibid 61.

<sup>&</sup>lt;sup>108</sup> ibid 65.
survey questions and design, sampling techniques and other scientific challenges to the adequacy of the survey and its CV methodology.'<sup>109</sup>

Later that year, defendants moved to strike the CV survey portion of the experts' damages report.<sup>110</sup> Specifically, they objected to a representation made to the survey respondents that alum treatments would speed the recovery of the river system from the excess phosphorus deposits.<sup>111</sup> In response, the experts clarified that they were not opining as to the efficacy of alum treatments as they had no expertise in the area; rather, the scenario was used as a 'plausible' means to elicit respondents' 'truthful valuations',<sup>112</sup> and it was 'immaterial to the validity of the results whether the mechanism generating the outcome is fictitious as long as it is accepted by respondents'.<sup>113</sup> The court denied the motion to strike, suggesting that defendants were 'trying to force the clubfoot of a *Daubert* challenge into the slender slipper of Rule 26'.<sup>114</sup> Whether the survey was acceptable as a valuation measure was 'perhaps an appropriate subject of a *Daubert* motion challenging the CV report'.<sup>115</sup>

#### 4.4.3 Comparing general and specific challenges

The case law on general challenges, taken as a whole, points to a single, unambiguous conclusion: every single general challenge against the use of CV for NRD assessment – whether under Type A or Type B rules issued under CERCLA, or under the NOAA rules issued under the OPA, whether on the grounds that it is speculative, flawed and unreliable (*Ohio* and *NAM*), or on the grounds that it confers too much discretion without adequate safeguards (*NAM* and *General Electric*), whether relating explicitly to scope choices (inclusion of option and existence values) or to methodology choices (admissibility of CVM and other stated preference methods) – has ended in failure.

<sup>&</sup>lt;sup>109</sup> ibid 67.

<sup>&</sup>lt;sup>110</sup> Oklahoma v Tyson Foods, Inc. 2009 US Dist LEXIS 114870 (ND Okla) ('Tyson').

<sup>&</sup>lt;sup>111</sup> ibid 18.

<sup>&</sup>lt;sup>112</sup> ibid 19.

<sup>&</sup>lt;sup>113</sup> ibid.

<sup>&</sup>lt;sup>114</sup> Rule 26 of the Federal Rules of Civil Procedure relates to the duty to disclose and general provisions governing discovery. For the *Daubert* standard, see *Daubert v Merrell Dow Pharmaceuticals, Inc.* 509 US 579 (1993).

<sup>&</sup>lt;sup>115</sup> *Tyson* (n 110) 21.

Moreover, *Ohio* and *General Electric* both held that passive-use values could be included in damage assessments, and since stated preferences methods are currently the only way of measuring passive-use values, the decisions are an indirect endorsement of stated preferences methods, of which CV is the most prominent.

In terms of plaintiff strategy, I identified a trend whereby the first general challenge – whether under CERCLA (*Ohio*) or OPA (*General Electric*) – tends to target both scope and methodology. However, once the court endorsed the inclusion of non-use values – option and existence values (*Ohio*) and lost passive-use values (*General Electric*) – petitioners' strategy moved to challenging the methodology. So far, such methodology challenges, whether directed against the use of stated preference methods in general or CVM in particular, have not succeeded either – at least, not when the challenges were framed in general terms.

On the other hand, the survey of specific challenges tells a different story. Where courts reached a final ruling about the validity of a specific CV study (*Southern Refrigerated* and *Montrose*), the verdict has invariably gone against CV. The remaining decisions may appear to favour the party which sought to rely on CV, but in reality, they have been a motion for summary judgment (*Kelley*), a motion *in limine* (*Atlantic Richfield*) and a motion to strike (*Tyson*). Even in those cases, as noted above, courts have occasionally tempered their approval with a degree of scepticism.

In particular, *Southern Refrigerated* and *Montrose* present an interesting contrast. As Thompson notes:

In *Southern Refrigerated*, the trustees did not have the funds for an original CVM study, so they incorporated a previously produced study. In *Montrose*, however, the trustees had significant funds to invest in a state of the art, site-specific, original CVM study. After extensive development, the trustees' economists produced a sophisticated study that met or exceeded the recommendations of the NOAA panel.<sup>116</sup>

<sup>&</sup>lt;sup>116</sup> Thompson (n 18) 84.

Nevertheless, both studies met the same fate: they were rejected because 'the facts used to develop the CVM studies were very different from the facts that were eventually presented to the courts.'<sup>117</sup> In particular, *Southern Refrigerated* suggests that courts are unwilling to accept a combination of CV and benefits transfer. On the other hand, original CV studies are expensive: the CV study in *Montrose* cost 8–10 million dollars (about 12 percent of the eventual settlement amount),<sup>118</sup> and of course (as happened in *Montrose*) even original studies may be rejected for factual or methodological shortcomings.

The case law on specific challenges suggests that a CV study may be deemed sufficiently reliable to be published in peer-reviewed economics and environmental journals, but nevertheless fail to meet judicial admissibility criteria for damage assessment purposes. However, courts have been reluctant to uphold scope challenges (ruling out non-use values altogether) or even methodology challenges (ruling out CVM), presumably because such a decision would have wider ramifications, excluding CV or non-use values by definition, even when performed to the very highest standards, and potentially excluding more sophisticated and reliable methods for estimating non-use values which economists may devise in future. Thus, this apparent contradiction between general and specific challenges can be explained in light of the broader context in which judicial decisions are made in a common law system, and judicial caution against setting sweeping precedents and in favour of confining rulings, where possible, to the circumstances at hand.<sup>119</sup>

#### 4.5 Diminished property value cases

Besides the NRD cases discussed in the previous section, there is a second major class of environmental cases where CV has been invoked, namely, cases where plaintiffs alleged that some form of environmental pollution caused their real property to decrease in value. My sample contains four such cases, all of which are specific

<sup>&</sup>lt;sup>117</sup> ibid 85.

<sup>&</sup>lt;sup>118</sup> ibid 81.

<sup>&</sup>lt;sup>119</sup> See generally Neil Duxbury, *The Nature and Authority of Precedent* (Cambridge University Press 2008).

challenges. As with specific challenges in the field of NRD assessment, the track record of CV in diminished property value cases is far from promising.

In *Abundiz v Explorer Pipeline Co.*,<sup>120</sup> plaintiff property owners filed suit for a release of 600,000 gallons of oil from a ruptured pipeline which drained into a tributary of East Caddo Creek. One of the defendants was QuikTrip Corp., which allegedly owned the oil at the time of the spill.

Plaintiffs did not claim that the contamination caused 'an imminent endangerment to health or the environment';<sup>121</sup> rather, they argued that it affected the value of their properties. By way of support they pointed to a CV analysis by Robert Simons, which found that only 8% of potential buyers would 'provide a bid to buy a home proximate to a [polluted] creek'.<sup>122</sup>

However, the court granted QuikTrip's motion for summary judgment, finding that plaintiffs had not presented sufficient evidence to sustain a claim against them. It therefore did not reach the question of the validity of the CV report itself, noting only that 'the use of this report begs the question as to whether East Caddo Creek continues to be polluted as a result of the pipeline rupture'.<sup>123</sup>

*Palmer v 3M Co.*<sup>124</sup> was a motion for class certification: plaintiffs claimed personal injury and property damage due to residential water supplies contaminated by perfluorochemical waste disposed by the defendant company. In seeking to establish that the case met the procedural requirements for class certification,<sup>125</sup> plaintiffs argued that the monetary relief they sought for property damages could be assessed objectively using methods proposed by their expert – the methods being real estate trends analysis and CV analysis.<sup>126</sup> The court denied class certification, holding that

<sup>123</sup> ibid.

<sup>&</sup>lt;sup>120</sup> 2003 US Dist LEXIS 22688 (ND Tex).

<sup>&</sup>lt;sup>121</sup> ibid 8.

<sup>&</sup>lt;sup>122</sup> ibid 8, fn 3.

<sup>&</sup>lt;sup>124</sup> 2007 Minn Dist LEXIS 162.

<sup>&</sup>lt;sup>125</sup> Rule 23 of the Minnesota Rules of Civil Procedure.

<sup>&</sup>lt;sup>126</sup> Palmer (n 124) 58.

'there are likely to be numerous conceptual and practical obstacles in the application of a class-wide formula to assess property damages'.<sup>127</sup> There are many factors that may impact each individual's property; therefore 'such damages are not amenable to computation by an easy or mechanical method'.<sup>128</sup>

*Cannon v BP Products North America*<sup>129</sup> (*'Cannon'*) was yet another motion for class certification arising from allegations that airborne chemical releases from defendant's refinery caused thousands of surrounding residential properties to decrease in value. Plaintiffs' expert, Dr Robert Simons, conducted a hedonic regression analysis, a real estate trends analysis and a CV survey, concluding that the chemical releases resulted in permanent economic losses (5 – 20 per cent of property value) to all affected properties.

The court found that Simons's regression model and real estate trends analysis were both unreliable.<sup>130</sup> As for the CV survey, the court expressed 'uncertainty that even Plaintiffs would argue that contingent valuation on its own – without the reinforcement of a regression or real estate trends analysis – would serve as a reliable calculation of damages'.<sup>131</sup> It noted:

A debate exists in the scientific community about the validity of contingent valuation as a methodology for assessing market discounts associated with real estate disamenities. ... [BP's expert] Jackson presents a number of problems with contingent valuation: it is not as reliable as the existing transactional data; hypothetical bias may exist because the respondents do not have to bear the consequences of their decisions; it does not incorporate many factors that go into a home purchase; and respondents may be biased or not understand the scenarios.<sup>132</sup>

<sup>&</sup>lt;sup>127</sup> ibid 60. However, the court clarified that it was by no means precluding plaintiffs from seeking damages individually. ibid 84.

<sup>&</sup>lt;sup>128</sup> ibid 60.

<sup>&</sup>lt;sup>129</sup> 2013 US Dist LEXIS 142934 (SD Tex).

<sup>&</sup>lt;sup>130</sup> ibid 29, 37.

<sup>&</sup>lt;sup>131</sup> ibid 39.

<sup>&</sup>lt;sup>132</sup> ibid 39–40.

The court concluded that that 'regardless whether contingent valuation is a reliable methodology in general', Simons's CV analysis in this case was not a reliable causation and damages model due to a number of control problems and factual inaccuracies.<sup>133</sup> Accordingly, the court granted BP's motion to exclude the entirety of Simons's testimony.

Finally, in *Hartle v FirstEnergy Generation Corp*<sup>134</sup> ('*Hartle*') the plaintiffs sought damages for property damage and adverse health effects from air pollution (in the form of 'white rain' and 'black rain') caused by the defendant's coal-fired power plant. To determine the impact of the pollution on property values, plaintiffs' expert, Dr John A Kilpatrick, used a combination of four different valuation methods: CV surveys, case studies of similar pollution incidents, meta-analysis of published research, and hedonic regression analysis of actual property values in the affected areas. Out of the four methods, the hedonic regression analysis showed the lowest diminution in property values (2–4 per cent for the white rain area and 14 per cent for the black rain area). The CV surveys, on the other hand, indicated a 12 per cent diminution in the white rain area and 45 per cent in the black rain area.<sup>135</sup>

To reconcile the four methods, Kilpatrick performed an 'implicit weighting process ... based on the quality and quantity of data'.<sup>136</sup> He found the survey research to be most compelling, closely followed by the meta-analyses and case studies. The hedonic regression analysis of actual sales prices, according to him, was least probative.<sup>137</sup> On that basis, he opined that the overall diminution in value was 12 per cent for the white rain area and 45 per cent for the black rain area.<sup>138</sup>

Kilpatrick carried out three CV surveys. He asked participants how much they would be willing to pay for a house in a neighbourhood affected by (a) white rain only, (b) both white and black rain, and (c) neither white nor black rain, but located near coal

<sup>&</sup>lt;sup>133</sup> ibid 40.

<sup>&</sup>lt;sup>134</sup> 2014 US Dist LEXIS 43033 (WD Pa).

<sup>&</sup>lt;sup>135</sup> ibid 11–12.

<sup>&</sup>lt;sup>136</sup> ibid 12, quoting from the hearing transcript.

<sup>&</sup>lt;sup>137</sup> ibid 30–31.

<sup>138</sup> ibid 13.

and nuclear power plants (control survey).<sup>139</sup> The 'fact card' for the white rain survey stated that the white rain contained radioactive elements, and that the power plant recommended that affected residents wash their hands after going outside and avoid home-grown produce. In fact, these statements were true for black rain, but not for the less harmful white rain. As a result, the court found the white rain survey 'fundamentally flawed'.<sup>140</sup> Furthermore, because the CV research weighed heavily in Kilpatrick's implicit 'weighting process', the court excluded the entirety of Kilpatrick's white rain opinion.<sup>141</sup>

FirstEnergy also contended that Kilpatrick's opinions were unreliable due to his disregard of his hedonic regression model and actual sales data. Kilpatrick argued that the low weight given to the sales data was justified because '[real estate] prices do not always reflect all available information'<sup>142</sup> – in this case, the extent of contamination. The court disagreed. Citing a previous environmental contamination case where Kilpatrick made a similar (ultimately unsuccessful) argument,<sup>143</sup> the court noted that the black rain events occurred over six years ago, and '[i]f the market is still uninformed after that amount of time, ... it is unreasonable to assume that this knowledge will suddenly become widespread'<sup>144</sup> leading to a further drop in prices. Describing Kilpatrick's assumption as 'pure speculation',<sup>145</sup> the court held that he may 'testify about diminution in property value from black rain based upon his modeling of actual prices, but may not opine about hypothetical market value loss based upon his contingent valuation surveys'.<sup>146</sup>

<sup>&</sup>lt;sup>139</sup> ibid 16.

<sup>&</sup>lt;sup>140</sup> ibid 19. However, the other alleged flaws in the survey, such as insufficient pretesting, non-representative and non-random sampling, hypothetical bias, etc. were "technical flaws" that go to the weight rather than admissibility of the survey.' ibid 20.

<sup>&</sup>lt;sup>141</sup> ibid 32–33, 43.

<sup>&</sup>lt;sup>142</sup> ibid 30, quoting from the hearing transcript.

<sup>&</sup>lt;sup>143</sup> Exxon Mobil Corp. v Albright 433 Md 303 (2013).

<sup>&</sup>lt;sup>144</sup> *Hartle* (n 134) 39.

<sup>&</sup>lt;sup>145</sup> ibid 40.

<sup>&</sup>lt;sup>146</sup> ibid 49.

In my sample, therefore, there is not a single reported 'diminished property value' case where plaintiffs have successfully relied on a CV study. CV studies in many cases were rejected purportedly due to control problems and factual inaccuracies. However, the court's *obiter* remarks in *Cannon* and particularly the rejection of the 'hypothetical' black rain opinion in *Hartle* suggest that in the 'diminished property value' context, courts view CV with a great deal of scepticism.

#### 4.6 Inferences from case law

#### 4.6.1 NRD, property value and the importance of context

There is an important theoretical distinction between the CV studies used in the NRD cases discussed in the previous section, and in the diminished property value cases discussed above, and this difference relates to the *context* of valuation. In the former, CV is generally used to estimate lost *non-use value*, whereas in the latter, the CV studies essentially seek to establish diminution in property prices, which can only be a measure of lost use value.<sup>147</sup> And unlike non-use values which can only be estimated using stated preference methods like CV, there is a range of (purportedly more reliable) revealed preference techniques for estimation of use values,<sup>148</sup> and at least one of them – hedonic pricing – has a long history of use in real estate valuation.<sup>149</sup> In this background, it is no surprise that courts have expressed a distinct preference for testimony on diminution in property value based on 'modeling of actual prices'.<sup>150</sup> Indeed, this supports the idea advanced in this thesis, and further elaborated in Chapter 8, that courts' valuation choices are guided by context – in this case, the type of damage which is at issue - in the first instance, natural resource damages potentially requiring the estimation of non-use values, and in the second instance, diminution of private property value (use value) caused by environmental damage.

<sup>&</sup>lt;sup>147</sup> An improvement (or deterioration) in an environmental resource or amenity can positively (or negatively) affect property prices only if the property owners expect to *use* it in some way.

<sup>&</sup>lt;sup>148</sup> See Chapter 2, Section 2.3.2.

<sup>&</sup>lt;sup>149</sup> Shanaka Herath and Gunther Maier, *The Hedonic Price Method in Real Estate and Housing Market Research: A Review of the Literature* (SRE Discussion Papers 2010).

<sup>&</sup>lt;sup>150</sup> *Hartle* (n 134) 49.

The rare instances where CV surveys have been accepted as evidence in a specific case (at least at a preliminary stage) are unrelated to the environment. In a case where plaintiffs were seeking class certification for individuals who suffered diminution of property values due to Hurricane Katrina and the levee breaches, defendants sought to exclude plaintiff's expert's testimony on several grounds, one of which was that 'survey techniques such as "contingent valuation" are inherently flawed and produce unreliable results'.<sup>151</sup> The court did not comment specifically on the reliability of CV, but professed itself satisfied that the methodology was sufficiently reliable to be presented at the class certification hearing.<sup>152</sup>

#### 4.6.2 *Strategic implications*

The cases analysed in Sections 4.4.2 and 4.5 above demonstrate that despite CV's decidedly unpromising track record in specific cases, plaintiffs continue to seek to rely on CV surveys. In fact, the legal area most amenable to CV appears to be consumer class actions, where numerous courts have accepted CV as a reliable methodology for calculating price premiums.<sup>153</sup> In a consumer class action relating to defective braking systems, the court held that CV and discrete choice experiments 'are generally accepted, have been tested, and are part of peer-reviewed studies'.<sup>154</sup>

In the NRD category, there is a broader normative question of whether plaintiffs ought to be able to use CV evidence or recover damages for lost non-use value in NRD cases.<sup>155</sup> But given that US law currently allows plaintiffs to do so, there is also

<sup>&</sup>lt;sup>151</sup> In re Katrina Canal Breaches Consolidated Litigation 2007 US Dist LEXIS 82887 (ED La) 249.

<sup>&</sup>lt;sup>152</sup> ibid 274–75. The court held that the relevant threshold at this stage was lower than that of a full-blown *Daubert* challenge at the merits stage. ibid 256.

<sup>&</sup>lt;sup>153</sup> This observation was made in *Miller v Fuhu Inc.* 2015 US Dist LEXIS 162564 (CD Cal). In the event, the court held that 'at least in theory', plaintiff's expert's proposal to use CV to measure damages was sound (ibid 64) but the plaintiff 'provided insufficient details regarding his proposed survey method for the Court to adequately assess its reliability' (ibid 64).

<sup>&</sup>lt;sup>154</sup> In re Toyota Motor Corp. Hybrid Brake Marketing 2012 US Dist LEXIS 151559 (SD Cal) 18, finding CV admissible to estimate damages arising from an anti-lock braking system defect.

<sup>&</sup>lt;sup>155</sup> This chapter does not engage with that particular debate, but there is a large body of literature on the subject; see Section 4.2 above.

a practical question of strategy. The fate of specific challenges suggests that plaintiffs have a greater likelihood of success if they seek restoration costs, or damages for lost use value (as opposed to non-use value). It is notable that in a claim for lost use value, the court allowed the benefits transfer approach in combination with the travel cost method,<sup>156</sup> in contrast to its stance against benefits transfer and CV in *Southern Refrigerated*.

In the diminished property value category, given the availability – and greater reliability – of revealed preference methods, it seems almost certain that testimony based on CV will be rejected. What is more, the improper use of CV might actually undermine an otherwise valid opinion, as proved to be the case with the white rain opinion in *Hartle*. Therefore, plaintiffs' continued efforts to rely on CV evidence seems at best, a pointless expenditure, and at worst, actively damaging to their own case.

<sup>&</sup>lt;sup>156</sup> People of the State of California ex rel. Department of Fish and Game v BP America, Inc. Orange County Superior Court Case Number 64 63 39 (1997) ('American Trader'). A good account of the trial, written by the testifying experts for the plaintiffs, appears in David J Chapman and W Michael Hanemann, 'Environmental Damages in Court: The American Trader Case' in Anthony Heyes (ed), The Law and Economics of the Environment (Edward Elgar Publishing 2001). For the defendants' perspective, see Richard W Dunford, 'The American Trader Oil Spill: An Alternative View of Recreation Use Damages' (1999) 19(1) Association of Environmental and Resource Economists Newsletter 12.

# Prospective Valuation in India: The Supreme Court on Forest Valuation

# 5.1 Introduction

The case study for this chapter on prospective environmental valuation in India is the so-called 'omnibus forest case', also known as the *Godavarman* case. The case, which originated as a public interest petition in 1995,<sup>1</sup> has now continued for more than two decades, involving over 2,000 interlocutory applications (separate writs) from all over the country and several hundred orders by the Supreme Court. In the process, it has had a profound and far-reaching impact on Indian forest policy and governance in general, and the valuation of forest land in particular.

Due to its relevance to Indian forest policy, constitutional import and indeed its sheer duration, the *Godavaraman* case has received significant academic and media attention. Dutta and Yadav<sup>2</sup> have provided an overview of the case and compiled the various Supreme Court orders (many of which are unreported) from 1996 to 2011.

On the rich and unique tradition of public interest litigation in India, see PN Bhagwati, 'Judicial Activism and Public Interest Litigation' (1984) 23 *Columbia Journal of Transnational Law* 561; Jamie Cassels, 'Judicial Activism and Public Interest Litigation in India: Attempting the Impossible?' (1989) 37(3) *American Journal of Comparative Law* 495; PP Craig and SL Deshpande, 'Rights, Autonomy and Process: Public Interest Litigation in India' (1989) 9 *Oxford Journal of Legal Studies* 356. On *environmental* public interest litigation, see Parvez Hassan and Azim Azfar, Securing Environmental Rights through Public Interest Litigation in South Asia' (2003-2004) 22 *Virginia Environmental Law Journal* 215; Michael G Faure and A V Raja, 'Effectiveness of Environmental Public Interest Litigation in India: Determining the Key Variables' (2010) 21(2) *Fordham Environmental Law Review* 239.

<sup>&</sup>lt;sup>2</sup> Ritwick Dutta and Bhupender Yadav, *Supreme Court on Forest Conservation* (3rd edn, Universal Law Publishing 2011).

Descriptive and historical accounts are also provided by Kohli *et al*<sup>3</sup> and Upadhyay *et al*.<sup>4</sup>

Critical commentary on the *Godavaraman* case has focused primarily on the constitutional merits of the Court's interventions, and in particular its implications for the doctrine of separation of powers. For instance, Rosenranz *et al* are critical of the Supreme Court's 'extreme' interventions<sup>5</sup> and its 'vast assumption of powers' whereby it assumed the role of not just an interpreter of law but also of a maker and administrator of forest policy.<sup>6</sup> In the same vein, Rosencranz and Lélé have criticised the Court for 'judicial overreach',<sup>7</sup> and for getting 'involved in micromanagement to a level that simply cannot be considered as falling within its purview',<sup>8</sup> and Chowdhury has argued that the Court 'pushed the limits of judicial activism' to a point where it is 'a good case for judicial adventurism'.<sup>9</sup>

At the same time, commentators have also recognised that the activism was prompted, perhaps even necessitated, by the 'national and state governments' inaction' with respect forest protection,<sup>10</sup> and that the Court's 'radical orders and ... wide assumption of powers slowed and possibly reversed two ecologically dangerous trends: that of an ineffective government and that of decreasing forest cover'.<sup>11</sup>

<sup>&</sup>lt;sup>3</sup> Kanchi Kohli and others, *Pocketful of Forests: Legal Debates on Valuating and Compensating Forest Loss in India* (Kalpavriksh and WWF-India 2011).

<sup>&</sup>lt;sup>4</sup> Sanjay Upadhyay, Shilpa Chohan and Archana Vaidya, *India's Forests and the Judiciary: The Godavarman Story* (WWF 2009).

<sup>&</sup>lt;sup>5</sup> Armin Rosencranz, Edward Boenig and Brinda Dutta, 'The *Godavarman* Case: The Indian Supreme Court's Breach of Constitutional Boundaries in Managing India's Forests' (2007) 37 *Environmental Law Reporter* 10032, 10042.

<sup>&</sup>lt;sup>6</sup> ibid 10032.

 <sup>&</sup>lt;sup>7</sup> Armin Rosencranz and Sharachchandra Lélé, 'Supreme Court and India's Forests' (2008)
43(5) *Economic and Political Weekly* 11, 13.

<sup>&</sup>lt;sup>8</sup> ibid.

<sup>&</sup>lt;sup>9</sup> Nupur Chowdhury, 'From Judicial Activism to Adventurism – The Godavarman Case in the Supreme Court of India' (2014) 17(1) Asia Pacific Journal of Environmental Law 177, 189.

<sup>&</sup>lt;sup>10</sup> Rosencranz and others (n 5) 10040.

<sup>&</sup>lt;sup>11</sup> ibid 10040–41.

In this Chapter, I skirt the much-debated constitutional propriety of the Supreme Court's actions, and focus instead on an aspect of the case which has received relatively little academic attention: the prospective valuation of forest land. Analysing the *Godavarman* case in light of the framework of valuation choices outlined in Chapter 1 reveals the (often implicit) valuation choices that were made in calculating the sums (namely compensatory afforestation levy and NPV) payable for diversion of forest land. It also allows us to make an *internal* evaluation of consistency – comparing certain abstract principles on environmental valuation enunciated by the court, against the *practical* impact of the *Godavarman* case as manifested by the valuation choices underlying the court's orders and in their social, economic and environmental impact.

Section 5.2 provides an overview of the case. Section 5.3 summarises the statutes, rules and guidelines which formed the background for the valuation of forest land. Sections 5.4 and 5.5 respectively explain the two key concepts of compensatory afforestation and net present value ('NPV'), and how these relate to economic valuation of forest land. Section 5.6 analyses the Court's justification and eventual implementation of the valuation of forest land. In Section 5.7, the practical implementation and impact are examined against the legal and philosophical principles of valuation enunciated by the Court itself. Section 5.8 concludes.

#### 5.2 The *Godavarman* case: an overview

In 1995, T N Godavarman Thirumulpad, a member of a princely family from Kerala, was travelling through the Nilgiri Mountains in the neighbouring state of Tamil Nadu, when he observed large-scale deforestation on land which formerly belonged to his family.<sup>12</sup> In a later interview, he explained:

<sup>&</sup>lt;sup>12</sup> Under land reforms implemented by the Gudalur Janmam Estates (Abolition and Conversion into Ryotwari) Act, 1969 (Act No 24 of 1969), the hereditary lands of certain princely families were acquired by the State of Tamil Nadu. See Siddhartha Krishnan, 'Of Land, Legislation and Litigation: Forest Leases, Agrarian Reform, Legal Ambiguity and Landscape Anomaly in the Nilgiris, 1969–2007' (2009) 7(4) *Conservation and Society* 283.

I was travelling through Gudalur and saw large areas of forests being felled and timber logs stacked up for sale. These forests at one time belonged to my family, the Nilambur Kovilakam. The ecological history of the Nilgiris has always been closely linked to the history of the Nilambur Kovilakam. The trees were being felled in violation of various legislations and rules.<sup>13</sup>

Concerned and distressed by what he observed, he filed a writ petition in the Supreme Court of India to check timber felling and generally ensure protection of the forest land.<sup>14</sup> This individual, almost impulsive intervention had a snowball effect that was to change the face of national forest policy.

The petition came before the Supreme Court in 1996. The Court's ensuing order,<sup>15</sup> which has been described as 'one of the most significant decisions of the Court on an environmental issue',<sup>16</sup> extended not only to the Nilgiri forests, but to the country as a whole. Among other things, the Court expanded the scope of the word 'forest' in the Forest (Conservation) Act, 1980<sup>17</sup> (hitherto the states had interpreted it much more restrictively) and ordered the immediate suspension of saw mills, mining and all other 'non-forest activities' which had not received explicit approval from the Central government.<sup>18</sup>

Even more significant was the Court's decision to keep the case open under a 'continuing mandamus'.<sup>19</sup> The case has now continued for more than two decades,

<sup>&</sup>lt;sup>13</sup> Anonymous, 'I Was Surprised at the Sweep of the Judgment' *Down to Earth* (New Delhi, 31 August 2002) <<u>http://www.downtoearth.org.in/interviews/i-was-surprised-at-thesweep-of-the-judgment-15034</u>> accessed 30 August 2019. See also PK Manohar and Praveen Bhargav, 'The Architect of an Omnibus Forest-Protection Case' The Hindu (Chennai, 5 July 2016) <<u>http://www.thehindu.com/opinion/open-page/The-architect-ofan-omnibus-forest-protection-case/article14470903.ece</u>> accessed 30 August 2019.

<sup>&</sup>lt;sup>14</sup> *T N Godavarman Thirumulpad v Union of India* Writ Petition (Civil) No 202 of 1995.

<sup>&</sup>lt;sup>15</sup> T N Godavarman Thirumulpad v Union of India AIR 1997 SC 1228; MANU/SC/0278/1997 ('Godavarman 1996').

<sup>&</sup>lt;sup>16</sup> Dutta and Yadav (n 2) 1.

<sup>&</sup>lt;sup>17</sup> Godavarman 1996 (n 15) [3]–[4].

<sup>&</sup>lt;sup>18</sup> ibid [5].

<sup>&</sup>lt;sup>19</sup> The term 'continuing mandamus' was first used by the Supreme Court in *Vineet Narain v* Union of India AIR 1998 SC 889. It is an exceptional remedy which allows the Court to

involving over 2,000 interlocutory applications (separate writs) from all over the country,<sup>20</sup> and several hundred Court orders that have profoundly shaped Indian forest policy and governance. (The legal proceedings are collectively referred to as the *Godavaraman* case,<sup>21</sup> and this chapter follows the same convention. Specific orders, where relevant, are denominated by year, e.g. *Godavarman* 1996.)<sup>22</sup>

The Supreme Court orders cover not only timber-felling (which was the central issue in *Godavarman 1996*), but aspects as diverse as transport and pricing of already-felled timber,<sup>23</sup> management of forest revenue<sup>24</sup> and protection of endangered species.<sup>25</sup> The focus of this chapter, however, is an analysis and critique of the Court's interventions in the matter of valuation of forest land. Accordingly, the next section sets out the statutory context for the *Godavarman* case, setting the stage for the subsequent four sections which focus on the case itself.

#### 5.3 Statutory framework

India's Forest (Conservation) Act, 1980 was enacted 'to provide for the conservation of forests' and other connected and ancillary matters, and '[w]ith a view to checking further deforestation'.<sup>26</sup> It contains restrictions on the 'use of forest land for nonforest

<sup>&#</sup>x27;oversee the implementation of its decision and intervene periodically to ensure the fulfilment of the concerned socio-economic right'. Rohan J Alva, 'Continuing Mandamus: A Sufficient Protector of Socio-Economic Rights in India' (2014) 44 *Hong Kong Law Journal* 207, 209. See also Mihika Poddar and Bhavya Nahar, '"Continuing Mandamus" – A Judicial Innovation to Bridge the Right-Remedy Gap' (2017) 10(3) *NUJS Law Review* 555. The *Godavarman* case is discussed at 584–88.

<sup>&</sup>lt;sup>20</sup> Leah Temper and Joan Martinez-Alier, 'The God of the Mountain and Godavarman: Net Present Value, Indigenous Territorial Rights and Sacredness in a Bauxite Mining Conflict in India' (2013) 96 *Ecological Economics* 79, 81.

<sup>&</sup>lt;sup>21</sup> See e.g. Chowdhury (n 9).

<sup>&</sup>lt;sup>22</sup> See n 15 above.

 <sup>&</sup>lt;sup>23</sup> T N Godavarman Thirumulpad v Union of India AIR 1998 SC 769; MANU/SC/0035/1998 [8],
[11].

 <sup>&</sup>lt;sup>24</sup> T N Godavarman Thirumulpad v Union of India AIR 2005 SC 4256; MANU/SC/0596/2005
[92] ('Godavarman 2005').

<sup>&</sup>lt;sup>25</sup> T N Godavarman Thirumulpad v Union of India (2012) 3 SCC 277.

<sup>&</sup>lt;sup>26</sup> Forest (Conservation) Act, 1980, Preamble. For historical accounts of forest law and policy in India dating back to the pre-1947 colonial era, see Richard Haeuber, 'Indian

purpose'.<sup>27</sup> Under the Act, the 'use of forest land for nonforest purpose' includes the breaking up or clearing of any forest land for any purpose including the cultivation of certain specified crops such as tea, coffee and rubber, but *excludes* reafforestation or forest management.<sup>28</sup> The Act also provides that no State Government or other authority can authorise such use without the prior approval of the Central Government.<sup>29</sup>

However, 'diversion of forest land for non-forest uses'<sup>30</sup> – a euphemistic phrase which in practice translates to giving over forest land to uses such as logging, mining and agriculture – is by no means ruled out under the Forest (Conservation) Act. The Forest (Conservation) Rules, 2003 ('the 2003 Rules') lay down the procedure for securing government approval for such diversion. The 'user agency', that is, the person or organisation making a request for diversion of forest land for non-forest purpose,<sup>31</sup> has to make a proposal in a specified form,<sup>32</sup> which is then reviewed by various State and Central Government officials. The user agency must also undertake to bear the cost of 'compensatory afforestation' and to pay 'net present value' ('NPV') of the diverted forest land.

The compensatory afforestation levy predates the *Godavarman* case,<sup>33</sup> while the requirement to pay NPV was introduced by a 2002 order of the Supreme Court in the *Godavarman* case.<sup>34</sup> In pursuance of the Court order, provisions relating to NPV were

Forestry Policy in Two Eras: Continuity or Change?' (1993) 17(1) *Environmental History Review* 49; Berthold Ribbentrop, *Forestry in British India* (Indus Publishing 2004); Richard P Tucker, *A Forest History of India* (SAGE Publications 2011).

<sup>&</sup>lt;sup>27</sup> Forest (Conservation) Act, 1980, s 2.

<sup>&</sup>lt;sup>28</sup> ibid.

<sup>&</sup>lt;sup>29</sup> ibid s 2(ii).

<sup>&</sup>lt;sup>30</sup> This euphemistic phrase appears in the Guidelines for Compensatory Afforestation, 2004 ('the 2004 CA Guidelines') issued by the Ministry of Environment and Forests (now known as the Ministry of Environment, Forest and Climate Change).

<sup>&</sup>lt;sup>31</sup> 'User agency' is defined in the 2003 Rules, Rule 2(h).

<sup>&</sup>lt;sup>32</sup> ibid Rule 6.

<sup>&</sup>lt;sup>33</sup> The compensatory afforestation scheme already existed in the Forest (Conservation) Rules, 1981 (as amended), which were replaced by the 2003 Rules.

<sup>&</sup>lt;sup>34</sup> T N Godavarman Thirumulpad v Union of India (SC 29 October 2002) reproduced in Dutta and Yadav (n 2) 205 ('Godavarman 2002').

subsequently incorporated into the 2004 CA Guidelines,<sup>35</sup> the 2003 Rules (via an amendment dated 14 March 2014),<sup>36</sup> and ultimately into statutory law under the Compensatory Afforestation Fund Act, 2016.<sup>37</sup> Both the compensatory afforestation levy and NPV entail valuation choices, which are further analysed in the next three sections.

## 5.4 Compensatory afforestation levy

#### 5.4.1 Compensatory afforestation levy as replacement cost

"Compensatory afforestation" is defined as 'afforestation done in lieu of the diversion of forest land for non-forestry use'.<sup>38</sup> It is worth noting that under the 2003 Rules, the user agency<sup>39</sup> is not required to actually carry out the compensatory afforestation; rather, it is required to draw up an afforestation plan,<sup>40</sup> and deposit the necessary 'compensatory levies' with the State government or Union Territory.<sup>41</sup> Thus the compensatory afforestation levy is essentially a form of *replacement cost*, designed to replace the forest land which was lost as a result of diversion towards non-forestry use.<sup>42</sup> This recognition allows us to use the framework of valuation choices to analyse the compensatory afforestation levy.

<sup>40</sup> 2003 Rules, Rule 6(1).

<sup>&</sup>lt;sup>35</sup> 2004 CA Guidelines (n 30) s 3.4.

<sup>&</sup>lt;sup>36</sup> 2003 Rules, Rule 8(1)(b).

<sup>&</sup>lt;sup>37</sup> s 6(b).

<sup>&</sup>lt;sup>38</sup> Compensatory Afforestation Fund Act, 2016, s 2(d).

<sup>&</sup>lt;sup>39</sup> For the definition of user agency, see n 31 above and accompanying text.

<sup>&</sup>lt;sup>41</sup> ibid Rule 8(1). There were serious shortcomings in the way funds for compensatory afforestation were being collected and utilised. In 2001 the Supreme Court noted that only about 63% of the funds realised by State Governments had actually been used for reforestation – a shortfall of nearly Rs 2 billion. *T N Godavarman Thirumulpad v Union of India* (SC 23 November 2001) reproduced in Dutta and Yadav (n 2) 186. However, the challenges of administering and implementing forest policy are outside the scope of this chapter.

<sup>&</sup>lt;sup>42</sup> In environmental economics, 'replacement cost' sometimes refers more narrowly to the 'cost of replacing a function of an ecological system with a *human engineered* system'. Sara Sundberg, 'Replacement Costs as Economic Values of Environmental Change: A Review and an Application to Swedish Sea Trout Habitats' (2004) 184 *Beijer Discussion Paper Series* 4 (emphasis added). However, it can also include 'restoration of an alternative

In imposing the replacement cost requirement, the 2003 Rules address the 'step zero' question – whether to use economic valuation – in the affirmative. The second of the three valuation choices – what values to measure – is addressed in the 2004 CA Guidelines, which contain provisions seemingly designed to ensure that the compensatory afforestation is an adequate replacement for the diverted forest land. For instance, it provides that when forest land is diverted for non-forest uses, compensatory afforestation 'shall be done over *equivalent area* of non-forest land',<sup>43</sup> and that the non-forest land for compensatory afforestation should be identified as close to the diverted land as possible so as to minimise ecological impact.<sup>44</sup>

Unfortunately, neither the 2003 Rules nor the 2004 CA Guidelines explicitly addresses the third valuation choice – how to measure the relevant values. As I argue in the following sub-section, the failure to address this choice, that is, the omission in specifying an appropriate valuation methodology, means that the compensatory afforestation levy stops short of being a satisfactory proxy for economic value.

#### 5.4.2 *Does the levy measure economic value?*

Replacement cost can be regarded as a proxy for economic value if certain formal conditions are met. However, the first of these conditions, that the replacement provides services that are equivalent in quality and magnitude to the original,<sup>45</sup> is unlikely to be met by compensatory afforestation under the 2004 CA Guidelines. The 'equivalent area' requirement in the 2004 CA Guidelines has, in practice, been interpreted to mean an *identical area*.<sup>46</sup>

This 'identical area' interpretation espouses a simplistic view of forests as fungible commodities; it assumes, say, that the loss of ten hectares of old forest could be

*environmental* resource', which is what the compensatory afforestation scheme envisages. Brian Preston, 'Economic Valuation of the Environment' (2015) 32 *Environmental and Planning Law Journal* 301 (emphasis added).

<sup>&</sup>lt;sup>43</sup> CA Guidelines (n 30) s 3.2(i) (emphasis added).

<sup>&</sup>lt;sup>44</sup> ibid s 3.2(ii)–(iii).

<sup>&</sup>lt;sup>45</sup> Leonard A Shabman and Sandra S Batie, 'Economic Value of Natural Coastal Wetlands: A Critique' (1978) 4(3) *Coastal Management* 231, 242; Sundberg (n 42) 4.

<sup>&</sup>lt;sup>46</sup> Kohli and others (n 3) 6.

adequately compensated for by ten hectares of newly-planted trees in another area. Such an assumption is incorrect for several reasons. First, replacing old, established forests with young plantations leads to large carbon losses to the atmosphere.<sup>47</sup> Second, secondary forests – as compared to old forests – play only a limited role as a biodiversity reservoir.<sup>48</sup> Third, fragmentation of habitats, caused by the diversion of parcelling up older forest land and 'replacing' them with potentially scattered 'equivalent' forests which are ideally but not necessarily close to the diverted land,<sup>49</sup> leads to biological impoverishment.<sup>50</sup>

In any event, even if a perfect replacement were possible, compensatory afforestation does not account for interim losses, that is, the welfare losses that are sustained until the newly planted area is capable of generating the same level of ecosystem services or welfare generated by the original diverted forest land.<sup>51</sup>

Thus, analysing the 2003 Rules and 2004 CA Guidelines through the lens of valuation choices reveals that the compensatory afforestation levy requirement addresses the first two valuation choices but not the third, namely, which valuation methods to use for measuring the relevant values. Instead, they contain only a loosely specified mandate for afforestation of an 'equivalent area'. The levy, I have argued, thus does not constitute a satisfactory proxy for economic value.

<sup>&</sup>lt;sup>47</sup> Ernst-Detlef Schulze, Christian Wirth and Martin Heimann, 'Managing Forests after Kyoto' (2000) 289(5487) *Science* 2058.

<sup>&</sup>lt;sup>48</sup> Michiel van Breugel and others, 'Succession of Ephemeral Secondary Forests and Their Limited Role for the Conservation of Floristic Diversity in a Human-Modified Tropical Landscape' (2013) 8(12) *PLoS One* e82433.

<sup>&</sup>lt;sup>49</sup> CA Guidelines (n 30) s 3.2(ii)–(iii).

<sup>&</sup>lt;sup>50</sup> Susan Harrison and Emilio Bruna, 'Habitat Fragmentation and Large-Scale Conservation: What Do We Know for Sure?' (1999) 22(3) *Ecography* 225.

<sup>&</sup>lt;sup>51</sup> Swanson and Kontoleon define interim losses as 'the diminution in value of the natural resources pending recovery of the resource to baseline'. Timothy Swanson and Andreas Kontoleon, 'What is the Role of Environmental Valuation in the Courtroom? The US experience and the Proposed EU Directive' (2003)

<sup>&</sup>lt;<u>https://www.elaw.org/system/files/Environmental.Valuation.Courtroom.pdf</u>> accessed 31 August 2019.

#### 5.5 Net present value

The aforementioned deficiencies with the compensatory afforestation scheme presumably played a role in the introduction of an additional payment obligation in the form of 'net present value' or NPV of diverted forest land. Before getting to the Supreme Court's role in the introduction of NPV, a brief explanation of the concept is in order.

#### 5.5.1 NPV as an accounting concept

NPV is an accounting concept used to calculate the *present* value of the future benefits from a project. This is done by discounting the future benefits using an appropriate discount rate, adding them up, then subtracting the cost of the initial investment.<sup>52</sup>

Mathematically, NPV can be expressed as:

$$NPV = \sum_{t=1}^{T} \frac{C_t}{(1+r)^t} - C_t$$

where:

t = the time of the future cash flow

T = the number of time periods

 $C_t$  = the net cash flow (inflow minus outflow) at time t

C = the cost of the initial investment, if any

r = the discount rate, expressed as a decimal

Consider, for instance, an area of existing forest land which is expected to survive for 3 more years and provide net benefits worth Rs 100,000 per year. If we adopt a

<sup>&</sup>lt;sup>52</sup> The Court defined NPV as 'the present value (PV) of net cash flow from a project, discounted by the cost of capital'. *Godavarman 2005* (n 24) [27]. This corresponds with the formal definition of NPV, as '[a] method of capital budgeting in which the value of an investment is calculated as the total present value of all cash inflows and cash outflows minus the cost of the initial investment.' Jonathan Law and Gary Owen (eds), *A Dictionary of Accounting* (4th ed, Oxford University Press 2010) 293.

discount rate of 5%, the *present values* of the benefits for each of the three years are as follows:

Year	Calculation	Present value
1	$\frac{100,000}{(1+0.05)^1}$	95,238.10
2	$\frac{100,000}{(1+0.05)^2}$	90,702.95
3	$\frac{100,000}{(1+0.05)^3}$	86,383.76
	Total	272,324.81

The NPV in this case is the sum of the *discounted* future values for each of the next 3 years, adding up to Rs 272,324.81. With a discount rate of 0%, the present values would simply be the sum of the future values, i.e. Rs 100,000 per year over three years, adding up to Rs 300,000.

The key thing to note is that NPV, as described above, is an accounting formula; it is not a valuation method *per se*. To use the language of valuation choices, it answers the step zero question – *whether* to value – in the affirmative, since it presupposes the valuation of future benefits accruing from a project, in order to prescribe how their present value may be calculated. By itself, it does not, however, provide any guidance on the scope choice – which precise benefits to value – nor on the methodology choice – how to quantify the future benefits ( $C_t$ ), or how to choose the discount rate (r). The valuer must independently determine what future values are to be measured, and also ascribe appropriate values of  $C_t$ , r and the other variables in the formula. Only then can NPV be used to calculate the present value of the future benefits.

#### 5.5.2 NPV adopted by the Court

In May 2002, the Supreme Court constituted a national-level Central Empowered Committee ('CEC') to assist the court and to monitor the implementation of its orders in the *Godavarman* case.<sup>53</sup> Later that year, in *Godavarman* 2002, the Court, following the CEC's recommendation,<sup>54</sup> passed an order directing that, in addition to the compensatory afforestation levy, a user agency must also pay 'the net value of the forest land diverted for non-forest purposes'.<sup>55</sup> It specified that 'the present value is to be recovered at the rate of Rs 5.80 lakhs [Rs 580,000] per hectare to Rs 9.20 lakhs [Rs 920,000] per hectare of forest land depending upon the quality and density of the land in question converted for non-forest use', the rate being subject to upward revision by the Ministry of Environment and Forests ('MoEF', renamed in 2014 to the Ministry of Environment, Forest and Climate Change) in consultation with the CEC as necessary.<sup>56</sup> However, other than referring to the CEC recommendation as a basis for NPV,<sup>57</sup> the Court in *Godavarman* 2002 did not elaborate on the basis for imposing payment of NPV, nor did it justify the specific rates which were prescribed.<sup>58</sup> These issues were addressed in more detail in *Godavarman* 2005.

### 5.6 Justifying and calculating NPV

## 5.6.1 NPV and valuation choices

In its landmark decision of 26 September 2005, the Court revisited the issue of NPV. It framed a series of questions for consideration, three of which are relevant for the purposes of this chapter:

- (a) Before diversion of forest land for non-forest purposes and the consequential loss of benefits hitherto accruing from the forests, should the user agency be required to compensate for the diversion?
- (b) If so, should the user agency be required to pay an amount corresponding to the NPV of the diverted land?

<sup>&</sup>lt;sup>53</sup> *T N Godavarman Thirumulpad v Union of India* (SC 9 May 2002) reproduced in Dutta and Yadav (n 2) 189, 190.

<sup>&</sup>lt;sup>54</sup> *Godavarman* 2002 (n 34) 211, citing a CEC report dated 5 September 2002.

<sup>&</sup>lt;sup>55</sup> *Godavarman* 2002 (n 34) 212.

<sup>&</sup>lt;sup>56</sup> ibid.

<sup>&</sup>lt;sup>57</sup> See n 54 above.

<sup>&</sup>lt;sup>58</sup> Subsequently, in *Godavarman 2005*, the Court clarified that the rates (Rs 580,000–920,000 per hectare) were chosen based on the fact that two states were already recovering NPV at those rates (in addition to the compensatory afforestation levy). *Godavarman 2005* (n 24) [14].

#### (c) How should NPV be calculated?<sup>59</sup>

In fact, these three questions track the three-step valuation choice framework outlined in Chapter 1. The first question, as further detailed in the following subsection, is about whether the user agency should be required to pay compensation *in addition* to the compensatory afforestation levy which was arguably insufficient and therefore ineffective. Thus, the court is asking a step zero question about whether an additional valuation step should be mandated for the user agency.

The second question relates to whether the levy should correspond to the value *of the diverted land,* and therefore to the scope choice as to which resource or amenity is to be valued. The third question self-evidently corresponds to the third valuation choice on what methodology to use for the valuation.

#### 5.6.2 The need for additional compensation

On the first question, the court referred to a 2002 CEC report<sup>60</sup> which noted that there was general consensus among the states, union territories and the MoEF that the existing practice of artificial regeneration through compensatory afforestation was inadequate compensation for the loss of natural forest.<sup>61</sup> There were two main reasons why compensatory afforestation was deemed insufficient. First, the Court cited the CEC's finding that the plantations raised under compensatory afforestation could never adequately compensate for the loss of natural forests because the plantations require more time to mature, and even when they do, they are a poor substitute for 'natural forest'.<sup>62</sup> Second, compensatory afforestation did not account for 'the loss of tangible as well as intangible benefits flowing from the forest lands'.<sup>63</sup> Interestingly,

<sup>&</sup>lt;sup>59</sup> Godavarman 2005 (n 24) [4].

<sup>&</sup>lt;sup>60</sup> Central Empowered Committee, 'Recommendations of the Central Empowered Committee in Interlocutory Application no. 566 of 2000 in Writ Petition (Civil) 202 of 1995' (9 August 2002), cited in *Godavarman* 2005 (n 24) [12].

<sup>&</sup>lt;sup>61</sup> Godavarman 2005 (n 24) [13].

<sup>62</sup> ibid.

<sup>63</sup> ibid.

these findings correspond with the theoretical problems, identified in Section 5.4 above, in using the compensatory afforestation levy as a replacement cost.

#### 5.6.3 The choice of NPV

The inadequacy of compensatory afforestation was held to be the 'underlying principle' for recovery of additional compensation in the form of NPV.<sup>64</sup> Having determined that the user agency should pay additional compensation, the next question was whether such compensation should be an amount corresponding to the NPV of the diverted land. The court justified the use of NPV (in particular, the discounting of future benefits that is a central feature of NPV) on the basis that 'a benefit received today is worth more than that received later'.<sup>65</sup> By using an 'appropriate discount rate in the NPV', future costs and benefits could therefore be 'levelised in order to account for the time value of money'.<sup>66</sup>

## 5.6.4 Calculating NPV

NPV, as noted in Section 5.5.1, is not a valuation method *per se*. As the Court itself recognised, the NPV calculation simply entails the use of a discount rate to calculate the present value of future benefits, offset against costs.<sup>67</sup> It requires the valuer to put a value on future benefits, and also determine the appropriate discount rate, both of which can be highly controversial. In other words, it requires the valuer to address two valuation choices: the scope choice (whether the amount should correspond to the value *of the diverted land*) and the methodology choice (what valuation method to use).

On the latter question, the Court noted that various methods exist for valuing intangible benefits, such as replacement cost, travel-cost and contingent valuation,<sup>68</sup>

<sup>&</sup>lt;sup>64</sup> ibid.

<sup>&</sup>lt;sup>65</sup> ibid [28]. The Court noted that the present value of any asset should be calculated by appropriately discounting 'the economic benefits it will generate in future years'. ibid [33].

<sup>&</sup>lt;sup>66</sup> ibid [28].

<sup>&</sup>lt;sup>67</sup> ibid [31].

<sup>68</sup> ibid [35].

but the choice of method would depend on the type of benefit which is sought to be measured.<sup>69</sup> Ultimately, the Court determined that a body of experts should examine the matter and recommend the most appropriate valuation method, taking into account the whole range of 'economic values associated with forests, viz., direct use values, indirect use values such as value of environmental benefits from the forest, option values and existence value.'<sup>70</sup> Likewise, the choice of discount rate was also left to the experts,<sup>71</sup> but the court specified that for a 'public project, such as forestry, a social discount rate, which indicates time preference of the society, should be used'.<sup>72</sup>

To settle these questions, the court directed that an expert committee consisting of Dr Kanchan Chopra (an economist from the Institute of Economic Growth, Delhi) and two other experts ('the Chopra Committee') be constituted.<sup>73</sup> The Chopra Committee's terms of reference included defining the parameters on the basis of which values of forest land should be estimated, formulating a 'practical methodology' to estimate the 'values in monetary terms' of different types of forest land in various bio-geographical zones of India, and illustratively applying the methodology to obtain actual numerical estimates for different forest types.<sup>74</sup>

The Chopra Committee held consultations with ecologists and legal experts, as well as regional hearings with stakeholders all over the country, including government departments, representatives of industry, civil society organisations and individuals,

<sup>&</sup>lt;sup>69</sup> ibid [37]–[38].

<sup>&</sup>lt;sup>70</sup> ibid [38], [49]. However, not all of these values were included in the final valuation: see Section 5.7.2 below.

<sup>&</sup>lt;sup>71</sup> ibid [38].

<sup>&</sup>lt;sup>72</sup> ibid [38]. On the theoretical foundations of social discount rate and discounting policies around the world, see Juzhong Zhuang and others, 'Theory and Practice in the Choice of Social Discount Rate for Cost-benefit Analysis: A Survey' (2007) ERD Working Paper No. 94 <<u>https://think-asia.org/bitstream/handle/11540/1853/wp094.pdf?sequence=1</u>> accessed 26 September 2019.

<sup>&</sup>lt;sup>73</sup> ibid [101].

<sup>&</sup>lt;sup>74</sup> ibid.

and submitted a detailed report in May 2006 ('the Chopra Committee Report').<sup>75</sup> In January 2007, following discussions with the MoEF and the Chopra Committee, the CEC filed its own report ('the CEC 2007 Report').<sup>76</sup> The following year, the recommendations of the CEC 2007 Report were adopted, essentially unchanged, by the Supreme Court in *Godavarman* 2008.<sup>77</sup>

Under the new scheme, which is still in effect, forests are classified into six 'eco-value classes' depending on their ecological functions.<sup>78</sup> Each eco-value class has three subclasses (very dense forest, dense forest and open forest), for a total 18 sub-classes.<sup>79</sup> Each sub-class is given a specific NPV per hectare (the highest being Rs 1,043,000 per hectare for very dense forests in Eco-Classes I and II, and the lowest being Rs 438,000 per hectare for open forests in Eco-Class IV).<sup>80</sup>

Additionally, the use of forest land in national parks and wildlife sanctuaries requires an NPV payment of ten times (in case of national parks) or five times (in case of wildlife sanctuaries) of the NPV ordinarily payable for the corresponding sub-classes. Such use is permitted 'only in totally unavoidable circumstances for public interest projects' and requires the approval of the Supreme Court.<sup>81</sup>

<sup>&</sup>lt;sup>75</sup> Kanchan Chopra and others, 'Report of the Expert Committee on Net Present Value' (2006) <<u>http://www.fedmin.com/upload/npvk.pdf</u>> accessed 2 September 2019. The hearings and consultations are detailed in para 1.3 and appendices 1–3 of the report.

 <sup>&</sup>lt;sup>76</sup> Central Empowered Committee, 'Supplementary Report in IA No. 826 in IA No. 566 Regarding Calculation of Net Present Value (NPV) Payable on Use of Forest Land of Different Types for Non-Forest Purposes' (2 January 2007)
<a href="http://www.prsindia.org/uploads/media/Compensatory%20Afforestation/bill185\_20080">http://www.prsindia.org/uploads/media/Compensatory%20Afforestation/bill185\_20080</a> <u>723185\_Central\_Empowered\_Committee\_Guidelines.pdf</u>> accessed 2 September 2019.

<sup>&</sup>lt;sup>77</sup> T N Godavarman Thirumulpad v Union of India (2008) 7 SCC 126; MANU/SC/7562/2008 [9]-[10].

<sup>&</sup>lt;sup>78</sup> ibid [3]. For instance, Eco-Class I consists of tropical wet evergreen forests, tropical semi evergreen forests and tropical moist deciduous forests, Eco-Class II consists of littoral and swamp forests, and so on.

<sup>&</sup>lt;sup>79</sup> ibid.

<sup>&</sup>lt;sup>80</sup> ibid [6].

<sup>&</sup>lt;sup>81</sup> ibid.

### 5.7 Principles and implementation

The previous two sections have detailed the somewhat long and convoluted process leading to the incorporation of NPV in its current form, as a legal prerequisite for the diversion of forest land for non-forest purposes, and as a proxy for the economic value of diverted forest land. To summarise, the process began with the Supreme Court's appointment of the CEC in 2002. The CEC's initial recommendation to require payment of NPV was followed by the Court in *Godavarman 2002*. In *Godavarman 2005*, the Court sought to retrospectively justify the NPV requirement, and constituted a second committee, the Chopra Committee, to calculate NPV. The Chopra Committee submitted its report in 2006, and the CEC filed another report in 2007. The recommendations in the CEC 2007 Report (which, as I argue below, differed in certain important respects to those of the Chopra Committee) were adopted by the Supreme Court in *Godavarman 2008*.

Along the way, and particularly in *Godavarman 2005*, the Supreme Court enunciated certain abstract legal and philosophical principles on environmental valuation. These principles, taken together, provide a premise against which the practical impact of the *Godavarman* case (as manifested by the valuation choices underlying the court's orders and their social, economic and environmental impact) may be compared. In this section, I evaluate the *Godavarman* case using the criterion of consistency; this, therefore, is an *internal* critique of the Court's orders, which is to say, I evaluate the effects of the orders against the principles and valuation choices articulated by the court itself. The following two sub-sections relate to scope choices, while the third relates to methodology choices.

#### 5.7.1 *Eco-value classes and social/local benefits*

A key difference between the Chopra Committee Report and the CEC 2007 Report is the concept of eco-value classes described in Section 5.6.4 above, which is arguably inconsistent with the Court's position that NPV should reflect not just environmental, but also social and in particular local benefits.<sup>82</sup>

The Chopra Committee laid down general guidelines for estimating NPV, but recommended that ultimately NPV should be determined in an 'entirely site specific' manner.<sup>83</sup> The CEC, on the other hand, argued that site-specific valuation was not feasible: it would be time consuming and in most cases 'beyond the capability' of the relevant officials.<sup>84</sup> Therefore, it simply classified forests into six eco-value classes, each with three sub-classes (very dense forest, dense forest and open forest) and then attributed a specific NPV per hectare to each sub-class.<sup>85</sup> The CEC also regarded these classes as comparable and fungible: for example, '17,997 sq.km. of open forest of Eco-Class IV has been calculated to be equivalent to 7,558 sq.km. of very dense forest of Eco-Value Class I'.<sup>86</sup>

Crucially, the eco-value classes defined by the CEC<sup>87</sup> and adopted by the Court<sup>88</sup> are purely based on bio-geographical criteria – for instance, Eco-Class II consists of littoral and swamp forests, and Eco-Class III is tropical dry deciduous forests. However, it is entirely possible that forest land of a specific sub-class (say, dense forest in Eco-Class III) in one part of the country may have a large local or indigenous population who directly rely on it for their livelihood and ecosystem services, while forest land from the same sub-class in another part of country is remote from any

<sup>&</sup>lt;sup>82</sup> Godavarman 2005 (n 24) [29], [42]–[43]

<sup>&</sup>lt;sup>83</sup> Chopra Committee Report (n 75) para 3.2.

<sup>&</sup>lt;sup>84</sup> Godavarman 2008 (n 77) [8].

<sup>&</sup>lt;sup>85</sup> CEC 2007 Report (n 76) para 13.

<sup>&</sup>lt;sup>86</sup> ibid para 9. As Temper and Martinez-Alier have argued, 'the ability to equate one patch of forest with any other patch of forest is key to the commodification process, to permit ... the producing of "landscapes that are conceived of as movable and consumable commodities."' Temper and Martinez-Alier (n 20) 82, quoting Morgan M Robertson, 'No Net Loss: Wetland Restoration and the Incomplete Capitalization of Nature' (2000) 32(4) *Antipode* 463, 464.

<sup>&</sup>lt;sup>87</sup> CEC 2007 Report (n 76) para 7.

<sup>&</sup>lt;sup>88</sup> Godavarman 2008 (n 77) [3].

human habitation. Site-specific assessment, as recommended by the Chopra Committee, would account for these differences, but eco-value classes do not.

In this respect, the concept of eco-value classes, as defined by the CEC, is inconsistent with the Court's position that NPV should reflect not just environmental but also *social* benefits. In *Godavarman 2005*, the court stressed the need to take into account the 'social and economic cost of diversion of forest',<sup>89</sup> and in particular the 'impacts on the social well-being of local and regional communities'.<sup>90</sup> The importance of use and non-use benefits accruing to local communities was emphasised not only by the Court, but also by the experts in the Chopra Committee, who noted that:

The maximum impact of forest diversion is on local populations, which live near and depend on forests. The impact is even more serious where tribal populations, scheduled castes and landless are affected as forests provide a substantial chunk of their livelihood and subsistence.<sup>91</sup>

Finally, the need to consider the social benefits and costs of any diversion of forest land is explicitly provided for in the National Forest Policy 1988,<sup>92</sup> a policy which, as the Supreme Court itself recognised, 'has a statutory flavour'.<sup>93</sup>

The rhetorical concern for local communities also did not translate into direct benefits for the affected communities due to the way NPV payments are applied in practice. I do not propose to explore this specific inconsistency in detail, since it relates less to environmental valuation (how NPV is calculated), and more to distributional justice

<sup>&</sup>lt;sup>89</sup> Godavarman 2005 (n 24) [29]. See also ibid [42], quoting an unnamed expert on forest valuation: 'By understanding market, *social* and other values of forests, we can better allocate our scarce and valuable resources to attain the desired mix of outcomes and conditions.' (emphasis added).

<sup>&</sup>lt;sup>90</sup> ibid [43].

<sup>&</sup>lt;sup>91</sup> Chopra Committee Report (n 75) para 5.

<sup>&</sup>lt;sup>92</sup> 'Diversion of forest land for any non-forest land for any non-forest purpose should be subject to the most careful examinations by specialists from the standpoint of *social* and environmental costs and benefits.' National Forest Policy, 1988, section 4.4.1.

<sup>93</sup> Godavarman 2005 (n 24) 74.

(how NPV is used).<sup>94</sup> However, it is worth noting that the Chopra Committee's guiding principle was that NPV payments are 'compensations for the loss of forest and the loss of the flow of goods and services accruing from it to diverse stakeholders'.<sup>95</sup> Both *Godavarman 2005* and *Godavarman 2008* likewise used the rhetoric of 'compensation',<sup>96</sup> but neither envisaged any part of the compensation going directly to the local stakeholders: it was entirely to be divided between the Union and the States.<sup>97</sup> (This position has now been enacted into law under the recent Compensatory Afforestation Fund Act.)<sup>98</sup> This 'disregard for the rights of [local] communities'<sup>99</sup> is the most likely explanation for the inconsistency identified above, between the Court's emphasis on social and local costs and benefits on the one hand, and the choice of eco-value classes as a basis for NPV on the other.

One reason why the interests of local stakeholders may have been overlooked is the unusual nature of the proceedings in *Godavarman*, where many of the issues were raised on the court's own motion, with the Union and States being invited to respond. Without the cut-and-thrust of the traditional adversarial process, judicial deliberations on who should be the beneficiary of the compensation were limited in scope: the only question was whether it should go to the Centre or the State.<sup>100</sup>

<sup>&</sup>lt;sup>94</sup> For a penetrating critique of the distributional effects of the Court's orders, see Temper and Martinez-Alier (n 20).

<sup>&</sup>lt;sup>95</sup> Chopra Committee Report (n 75) para 2.1. The Chopra Committee noted that it is a 'fundamental rule of natural justice ... that those who lose from an activity should be compensated for the loss on a site specific basis and on time'. ibid para 5.

<sup>&</sup>lt;sup>96</sup> See e.g. *Godavarman 2008* (n 77) [1], stating that NPV was introduced because it was deemed fit that the user agency should '*compensate* for the diversion of the forest'. (emphasis added).

<sup>&</sup>lt;sup>97</sup> Godavarman 2005 (n 24) [19], [23]. By contrast, the Chopra Committee had recommended that of the total NPV recovered, 100% of non-timber forest products, fuel wood and fodder values; 50% of watershed services and 45% of biodiversity values should go to *local stakeholders,* with the remainder being shared between the state and national levels. Chopra Committee Report (n 75) para 3.3.

<sup>&</sup>lt;sup>98</sup> Compensatory Afforestation Fund Act, 2016, s 5–6.

<sup>&</sup>lt;sup>99</sup> Temper and Martinez-Alier (n 20) 82.

<sup>&</sup>lt;sup>100</sup> See e.g. *Godavarman* 2005 (n 24) [25]: 'Most of the States did not object to the recovery of the NPV from the user-agency but strenuously urged that since the land under the forest belongs to the State, the amount deposited by the user-agency as NPV shall be paid to them.'

Similarly, deliberations about the discount rate (see Section 5.7.3 below) were limited to whether it was too low: the user agencies argued that it should be set at 10%.<sup>101</sup> There was no claim – other than in the CEC's own report, that it was too high.<sup>102</sup>

### 5.7.2 Categories of value

In *Godavarman* 2005, the Court took a relatively expansive position on the scope choice, holding that the NPV calculation should incorporate not only direct use values, but also 'indirect use values such as [the] value of environmental benefits from the forest, option values and existence value'.<sup>103</sup>

Eventually, however, only the following goods and services were monetised and included in the NPV calculation:

- (a) Timber and fuel wood;
- (b) Non-timber forest products;
- (c) Fodder;
- (d) Eco-tourism;
- (e) Bio-prospecting;
- (f) Ecological services;
- (g) Flagship species; and
- (h) Carbon sequestration.<sup>104</sup>

These categories all represent various forms of direct and indirect use value; they do not include option and existence value. At most, it could be argued that option or existence values are an element in the value attributed to flagship species (though this is based on conjecture, and not supported by anything in the CEC 2007 Report). However, the 'flagship species' category, which did not feature in the Chopra Committee Report, is controversial for other reasons. *First*, it accounted for over 33%

<sup>&</sup>lt;sup>101</sup> *Godavarman* 2008 (n 77) [7].

<sup>&</sup>lt;sup>102</sup> CEC 2007 Report (n 76) para 14. See n 115 above and accompanying text.

<sup>&</sup>lt;sup>103</sup> Godavarman 2005 (n 24) [38].

<sup>&</sup>lt;sup>104</sup> Godavarman 2008 (n 77) [5], following CEC 2007 Report (n 76) para 13. The categories broadly track those which were identified by the Chopra Committee Report (n 75) para 3.3; the principal differences are that the CEC expanded the Chopra Committee's category of watershed services to 'ecological services' and added two new categories: bio-prospecting and flagship species.

of the NPV in the CEC's calculus – more than any other category and nearly twice as much as ecological services.<sup>105</sup> *Second*, in any event, conservationists argue that a focus on flagship species for conservation purposes can be arbitrary and even counterproductive.<sup>106</sup>

Additionally, the Court's orders made repeated references to the need to account for intangible benefits,<sup>107</sup> and the Chopra Committee also recognised that forests can have non-material benefits, including spiritual, recreational, aesthetic, inspirational, educational, communal and symbolic benefits.<sup>108</sup> However, as is evident from the list above, such benefits also did not feature in the final NPV calculation, except, arguably, to the extent that they add to ecotourism. As with the choice of eco-value classes, the categories of value thus ignore much of the intangible benefits, such as spiritual, recreational, aesthetic and other benefits, flowing to local communities and users of the forest land.

#### 5.7.3 Discount rate

Finally, in the more technical field of methodology choice, the Court initially left the choice of discount rate (the variable r in Section 5.5.1 above) to the experts,<sup>109</sup> but prescribed the use of 'a social discount rate, which indicates time preference of the society, should be used'.<sup>110</sup> The Chopra Committee recommended that NPV should

<sup>&</sup>lt;sup>105</sup> CEC 2007 Report (n 76) para 12.

<sup>&</sup>lt;sup>106</sup> See e.g. Daniel Simberloff, 'Flagships, Umbrellas, and Keystones: Is Single-Species Management Passé in the Landscape Era?' (1998) 83(3) *Biological Conservation* 247; TM Caro and Gillian O'Doherty, 'On the Use of Surrogate Species in Conservation Biology' (1999) 13(4) *Conservation Biology* 805.

<sup>&</sup>lt;sup>107</sup> See e.g. *Godavarman* 2005 (n 24) [34], [35], [36].

<sup>&</sup>lt;sup>108</sup> Chopra Committee Report (n 75) para 2.2.2.

<sup>&</sup>lt;sup>109</sup> Godavarman 2005 (n 24) [38].

<sup>&</sup>lt;sup>110</sup> ibid [38]. On the theoretical foundations of social discount rate and discounting policies around the world, see Zhuang and others (n 72).

be calculated 'over 20 years at 5% social rate of discount',<sup>111</sup> while the CEC adopted a discount rate of 4%,<sup>112</sup> which was accepted by the Court in *Godavarman* 2008.<sup>113</sup>

However, even a 4% discount rate is arguably too high. A 2015 survey of over 200 experts found a mean recommended social discount rate of 2.27%.<sup>114</sup> Likewise, Partha Sen, a professor at the Delhi School of Economics who was consulted by the CEC, recommended a social discount rate of 2% but noted that 'the social rate discount *should ideally be zero* so as to give equal weight to the consumption of all generations, including the unborn'.<sup>115</sup>

To put the numbers into perspective, applying Sen's recommended discount rate of 2% (as opposed to 4%) over 20 years would have resulted in an NPV per hectare that is over 20% higher.<sup>116</sup> Theoretically, a relatively high discount rate (as recommended by the CEC and adopted by the Court) would result in an undervaluation of forests, which undermines the court's statement in *Godavarman* 2005 that the 'basis of [NPV] is the theory of sustainable development, i.e., development that meets the needs of the present without compromising with the ability of future generations to meet their own needs.'<sup>117</sup> Indeed, the Court made several references to intergenerational equity,<sup>118</sup> and viewed forests and other natural resources as being held in trust for future generations.<sup>119</sup>

<sup>&</sup>lt;sup>111</sup> Chopra Committee Report (n 75) para 3.3.

<sup>&</sup>lt;sup>112</sup> CEC 2007 Report (n 76) para 14.

<sup>&</sup>lt;sup>113</sup> Godavarman 2008 (n 77) [7].

<sup>&</sup>lt;sup>114</sup> Moritz Drupp and others, 'Discounting Disentangled' (2015) Centre for Climate Change Economics and Policy Working Paper No 195 <<u>http://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2015/06/Working-Paper-172-Drupp-et-al.pdf</u>> accessed 26 September 2019.

<sup>&</sup>lt;sup>115</sup> CEC 2007 Report (n 76) para 14 (emphasis added).

<sup>&</sup>lt;sup>116</sup> Using the illustrative value of future benefits, used in Section 5.5.1 above, of Rs 100,000 per year, the NPV over 20 years is approximately Rs 1,359,000 for a discount rate of 4% and Rs 1,635,000 for a discount rate of 2%.

<sup>&</sup>lt;sup>117</sup> Godavarman 2005 (n 24) [49].

<sup>&</sup>lt;sup>118</sup> ibid [62], [90], [100].

<sup>&</sup>lt;sup>119</sup> ibid [63], [80], [91].

The choice of the 20-year period (the variable *T* in Section 5.5.1 above) is also questionable. If we accept the Supreme Court's position that compensatory afforestation plantations, even after the time needed to mature, are a poor substitute for natural forests,<sup>120</sup> the loss of use and non-use values arguably extends beyond 20 years (and perhaps in perpetuity). In *Godavarman* 2005, the Court affirmed that '[f]orest sustainability is an integral part of forest management and policy ... and calls for forest owners and society to make a long-term (50 years or longer) commitment to manage the forest for future generations'.<sup>121</sup> Using a 50-year (as opposed to a 20-year) period would have resulted in an NPV per hectare that is over 58% higher.<sup>122</sup> A shorter-than-appropriate time-period, like a higher-than-appropriate discount rate, would result in an undervaluation of forests.

#### 5.8 Conclusion

As far as the Supreme Court was concerned, *Godavarman 2008* finally settled the key questions around valuation of forest land that had surfaced with the imposition of NPV in 2002. However, a close study of the court decisions with specific attention to the question of valuation reveals divergences between the legal and philosophical principles espoused by the court on the one hand, and the mechanics of forest valuation which eventually received the court's seal of approval on the other: in particular, the non-inclusion of certain forms of value<sup>123</sup> and the choice of discount rate.<sup>124</sup> In other words, the valuation choices – what forms of value to include, and how to measure them – that were made in practice do not necessarily reflect the legal and philosophical principles that ought to have informed those choices.

The divergences between principles and practice seem to be largely a product of the way the Supreme Court understood and defined the boundaries of its own role and

<sup>&</sup>lt;sup>120</sup> ibid [13].

<sup>&</sup>lt;sup>121</sup> ibid [40].

<sup>&</sup>lt;sup>122</sup> Using the illustrative value of future benefits, used in Section 5.5.1 above, of Rs 100,000 per year, the NPV, for a discount rate of 4%, is approximately Rs 1,359,000 for a 20-year period and Rs 2,148,000 for a 50-year period.

<sup>&</sup>lt;sup>123</sup> See Section 5.7.2 above.

<sup>&</sup>lt;sup>124</sup> See Section 5.7.3 above.

that of the expert committees. As discussed in Section 5.6.4 above, the choice of valuation method was ultimately left to the economists. However, the question of which values are relevant both precedes and dictates the choice of valuation method. Furthermore, it is not necessarily an economic question, and can depend on the context in which the valuation will be carried out. The court in fact stated that option values and existence value should be included in the NPV calculation<sup>125</sup> but this direction did not find its way into the terms of reference, which were framed much more broadly. Nor did the court review or meaningfully engage with the CEC 2007 Report (including its underlying assumptions about the relevant forms of value), opting instead to adopt its recommendations more or less wholesale<sup>126</sup> despite the deviations from the Chopra Committee Report.

An interesting clue to the court's attitude towards the valuation of forest land appears in the penultimate paragraph of *Godavarman 2008*: 'We are of the view that the NPV now fixed is more scientific and is based on all available data.'<sup>127</sup> Valuation can be a subjective, contested, messy process, but perhaps it can appear less so when the enquiry is framed not in the form of philosophical, political, and legal questions but in economic, apparently objective terms.

<sup>&</sup>lt;sup>125</sup> *Godavarman* 2005 (n 24) [38]. See Section 5.6.4 above.

<sup>&</sup>lt;sup>126</sup> Godavarman 2008 (n 77) [9]–[10].

<sup>&</sup>lt;sup>127</sup> ibid [9] (emphasis added). The court apparently plays out the role of 'the trier of fact who associates scientists [or in this case, economists] with ideals of objectivity, trustworthiness and truth.' Harold Leventhal, 'Environmental Decisionmaking and the Role of the Courts' (1974) 122 University of Pennsylvania Law Review 509, 547. See also Sheila Jasanoff, Science at the Bar: Law, Science, and Technology in America (Harvard University Press 2009) xiv: 'The institutional setting of the law shapes the representation of legally relevant scientific claims at many points, beginning with the articulation of standards for what counts as valid science within the legal process.'

# Chapter 6

# How Much Should the Polluter Pay: Indian Courts and the Valuation of Environmental Damage

# 6.1 Introduction

For over two decades, Indian courts have regularly invoked the Polluter Pays Principle in holding polluters liable for environmental damage.<sup>1</sup> On the face of it, the Polluter Pays Principle simply prescribes that 'the costs of environmental pollution should be borne by those whose activities were responsible for causing the pollution'.<sup>2</sup> Formulated in such terms, the principle seems inarguable, practically a truism. However, in practice, implementing the Polluter Pays Principle raises a number of complex questions. As de Sadeleer notes, the principle's 'apparent simplicity ... masks a number of ambiguities and its outlines continue to be poorly defined at the legal level.'<sup>3</sup>

One of the key questions to be confronted in applying the Polluter Pays Principle is determining how much the polluter should pay,<sup>4</sup> which, in turn, frequently entails valuation of environmental damage. Cases where Indian courts have interpreted and applied the Polluter Pays Principle therefore offer valuable insights into courts' approaches to the retrospective valuation of environmental damage.

<sup>&</sup>lt;sup>1</sup> In *Indian Council for Enviro-Legal Action v Union of India* AIR 1996 SC 1446 (*'Enviro-Legal Action'*), the Supreme Court held for the first time that the Polluter Pays Principle was relevant in determining the liability of the respondents. ibid [67].

<sup>&</sup>lt;sup>2</sup> Maurice Sunkin, David M Ong and Robert Wight, *Sourcebook on Environmental Law* (2nd edn, Cavendish Publishers 2002) 53.

<sup>&</sup>lt;sup>3</sup> Nicolas de Sadeleer, *Environmental Principles: From Political Slogans to Legal Rules* (Oxford University Press 2002) 33.

<sup>&</sup>lt;sup>4</sup> Other important questions, which lie outside the scope of this chapter, include: What constitutes pollution? Who is the polluter? Can the polluter pass on the costs further down the supply chain or to the consumer? Who receives the payment, and how should it be used?
The first appearance of the Polluter Pays Principle in a legal context was in a 1972 recommendation by the Organization for Economic Cooperation and Development ('OECD').<sup>5</sup> Since then, the principle has been incorporated into a number of international treaties and instruments,<sup>6</sup> and also, in many jurisdictions, into domestic law.<sup>7</sup> Among such jurisdictions, India presents a particularly interesting case study, in that the Indian Supreme Court has declared that the Polluter Pays Principle is 'part of the law of the land',<sup>8</sup> and the principle has been granted statutory recognition in the National Green Tribunal Act, 2010 ('the NGT Act'). As such, there is a rich body of Indian case law interpreting and applying the principle in a variety of contexts.

In this chapter, I focus on one of foremost challenges in implementing the principle: determining how much the polluter should pay.<sup>9</sup> Section 6.2 sets out the economic-theoretical framework, outlining the principle's origins in economic theory as a solution to the problem of externalities, and establishes how environmental valuation figures in the economic model. In Section 6.3, I trace the Polluter Pays Principle's legal foundations in OECD policy and international law, and its subsequent incorporation and integration into Indian environmental law.

Sections 6.4 and 6.5 form the analytical core of the chapter, showing how Indian courts have resolved questions of scope and methodology when it comes to quantifying damages under the Polluter Pays Principle (these correspond to the

<sup>&</sup>lt;sup>5</sup> OECD, Recommendation of the Council on Guiding Principles Concerning International Economic Aspects of Environmental Policies (26 May 1972) C(72)128, (1972) 11 ILM 1172 ('OECD 1972 Recommendation').

<sup>&</sup>lt;sup>6</sup> See Section 6.3.1 below.

<sup>&</sup>lt;sup>7</sup> See de Sadeleer (n 3) 32–33 for a brief account of the principle's 'significant influence on the evolution of national law'.

<sup>&</sup>lt;sup>8</sup> Vellore Citizens Welfare Forum v Union of India AIR 1996 SC 2715 ('Vellore') [13]. The Indian Supreme Court has been described as 'by far the most activist court in the Third World in the field of environmental protection'. Kaniye SA Ebeku, 'Judicial Contributions to Sustainable Development in Developing Countries: An Overview' (2003) 15(3) Environmental Law and Management 168, 173.

<sup>&</sup>lt;sup>9</sup> Other important questions include: What constitutes pollution? Who is the polluter? Can the polluter pass on the costs further down the supply chain or to the consumer? Who receives the payment, and how should it be used?

second and third valuation choices: *what* is to be measured, and *how* that measurement is to be done). Section 6.6 concludes.

Thus, using the lens of valuation choices, I identify and classify the quantification approaches taken by the Indian Supreme Court and the more recently-established National Green Tribunal of India ('NGT') in applying the Polluter Pays Principle, and what they reveal about the scope and methodology of damage assessment. The picture that emerges is of an innovative, though not altogether coherent body of case law. However, the use of the framework enables us (a) to identify the precise scope of the Polluter Pays Principle under Indian law which can be justified with reference to idea of context-driven valuation, and (b) to identify and evaluate three distinct strands in the approaches taken by Indian courts to quantification, thus contributing to a more systematic understanding of the Polluter Pays Principle jurisprudence. I also identify certain gaps and inconsistencies in these approaches and suggest ways in which they can be resolved, making the judicial interpretation and application of the principle more consistent, logical and effective.

### 6.2 Economic foundations

This section sets out the economic-theoretical framework, outlining the Polluter Pays Principle's origins in economic theory as a solution to the problem of externalities, and establishing how environmental valuation figures in the economic model. The discussion thus sets the stage for Section 6.3, which shows how the economic theory was incorporated into international and domestic (Indian law), and also furnishes the theoretical framework for the case-law analysis in Sections 6.4 and 6.5.

## 6.2.1 *Externality theory*

The foundation of the Polluter Pays Principle is the economic theory of externalities. An externality may be defined as 'a cost or benefit imposed on or provided to others but not taken into account by the economic agents who generate the effect'.<sup>10</sup>

The standard economics approach to externalities may be illustrated by the following hypothetical example. Consider a paper mill which discharges sludge into a nearby river. The production of paper involves costs, such as the cost of materials, labour and power. These costs are assumed to be reflected in the price agreed between the paper mill and its customers (i.e. the agents who generate the effect, namely paper production). Such costs are therefore said to be *internalised* by the parties to the transaction.

<sup>&</sup>lt;sup>10</sup> AH Barnett and Bruce Yandle, 'The End of the Externality Revolution' (2009) 26(2) Social Philosophy and Policy 130, 130. Meade's influential 1973 text proposed the following definition: 'An external economy (diseconomy) is an event which confers an appreciable benefit (inflicts an appreciable damage) on some person or persons who were not fully consenting parties in reaching the decision or decisions which led directly or indirectly to the event in question.' James Edward Meade, *The Theory of Economic Externalities: The Control of Environmental Pollution and Similar Social Costs* (Sijthoff 1973) 15. The term is not without its critics. Randall calls externality 'a vacuous and entirely unhelpful term [which] can be replaced by the more general term *inefficiency* with no loss of content.' Alan Randall, 'The Problem of Market Failure' (1983) 23 Natural Resources Journal 131, 132.

However, if the mill can discharge sludge into the river with impunity ('the *no-liability scenario*'), the mill imposes certain costs – damage to the environment, harm to other users of the river – which are *not* reflected in its cost of production, nor in the amount of paper that is ultimately produced. These constitute an *externality* (in this example, a *negative* externality). If the externality is allowed to persist, the consequence will generally be over-production of paper, that is, production at a level higher than that which is economically efficient.



Fig. 6-1

This intuitive conclusion is demonstrated in Fig. 6-1 above. The horizontal axis measures the quantity of sludge discharged by the paper mill. The vertical axis measures marginal cost. The upward-sloping curve, *MEC*, represents the marginal environmental cost of each unit of sludge (we assume for now that it is borne entirely by downstream users). The downward-sloping curve, *MAC*, represents the marginal abatement cost, that is, the cost to the paper mill of reducing a unit of sludge – whether that reduction is achieved by reducing its output, introducing better effluent-control measures, or any other means.

In the no-liability scenario, the mill would produce T units of sludge, since any reduction in sludge would entail a cost to the mill – a cost which it has no incentive

to incur. The total cost to the environment would then be *P'PT* (since the *MEC* curve measures *marginal* cost, the *total* cost is measured by the area under the curve).

Taking *T* as the starting-point, we can see that a small reduction in the amount of sludge produced to, say, *S*, results in a large decrease in the total environmental cost – in other words, a large environmental benefit – represented by the quadrilateral TSS'T', with only a small corresponding increase in cost to the mill: the triangle  $TSS^*$ . The move thus results in a net benefit to society of  $TSS'T'-TSS^*$ , or  $TS^*S'T'$ .

As long as the marginal environmental benefit from reducing sludge is higher than the marginal abatement cost – that is, as long as the *MEC* curve is higher than the *MAC* curve – sludge reduction has a net benefit to society. This state of affairs persists up to the point *R*. Any further reduction to, say, *Q* incurs a cost of RQQ'R' and a benefit of only  $RQQ^*R'$ , that is, a net loss to society. *R*, therefore, represents the 'efficient level of pollution'.

At *R*, the total cost to society is the triangle TPR' – the sum of TRR' (the cost incurred by the mill in abating from *T* to *R*) and *PRR'* (the environmental cost).

Note that the most environmentally-friendly solution is for the mill to produce no sludge at all (the point O) or at least, only as much sludge as will have no environmental cost (the point P). In each of these cases, the environmental cost is zero. However, the extreme abatement imposes a high cost on the mill – the large triangles TOO' (if abating to O) and TPP' (if abating to P), and the total cost to society turns out to be far greater than that under 'efficient pollution' (the smaller triangle

*TPR'*).<sup>11</sup> As Kula bluntly notes, 'From a purely economic viewpoint, complete elimination of externalities is neither practicable nor desirable.'<sup>12</sup>

Twentieth-century economics has produced two dominant – and contesting – approaches to ensure that polluters do not produce more than the socially optimal level of pollution: these may be characterised as *government-intervention remedies* and *bargaining-based remedies*.<sup>13</sup>

### 6.2.2 Government-intervention remedies

Government-intervention remedies, which have their theoretical roots in the work of the English economist, Arthur C Pigou,<sup>14</sup> suggest that where an economic activity

100% pollution abatement is seldom warranted in economic theory and is rarely required by governments. In most situations the marginal costs of pollution abatement rise and the marginal benefits of abatement fall as abatement is pursued. The socially optimal level of pollution – that level that minimizes total social costs of pollution control and pollution damages – leaves some residual pollution.

- <sup>13</sup> In the economics literature, these are often referred to respectively as the *Pigouvian* and the *Coasean* remedies. It is true that, broadly speaking, Pigou had more confidence in government intervention and Coase in markets, but Pigou and Coase's policy recommendations have more in common, and are, in any event, more nuanced, than is commonly supposed. See Nahid Aslanbeigui and Steven G Medema, 'Beyond the Dark Clouds: Pigou and Coase on Social Cost' (1998) 30(4) *History of Political Economy* 601.
- <sup>14</sup> Arthur C Pigou, *The Economics of Welfare* (4th edn, Macmillan 1932). Johnson traces the origin of externality theory to the earlier work of Henry Sidgwick. David B Johnson,

<sup>&</sup>lt;sup>11</sup> This derivation, in various forms, appears in many environmental economics texts. See e.g. Jean-Philippe Barde, 'National and International Policy Alternatives for Environmental Control and Their Economic Implications' in Ingo Walter (ed), *Studies in International Environmental Economics* (Wiley 1976) 138–39; Erhun Kula, *Economics of Natural Resources, the Environment and Policies* (2nd edn, Chapman & Hall 1994) 179–81; Bernard Salanié, *Microeconomics of Market Failures* (MIT Press 2000) 89–92. A detailed treatment, enumerating the various simplifying assumptions underlying the derivation, is found in John Pezzey, 'Market Mechanisms of Pollution Control: "Polluter Pays", Economic and Practical Aspects' in R Kerry Turner (ed), *Sustainable Environmental Management: Principles and Practice* (Belhaven Press 1988) 196–203.

<sup>&</sup>lt;sup>12</sup> Kula (n 11) 179. See also Frank I Michelman, 'Pollution as a Tort: A Non-Accidental Perspective on Calabresi's *Costs*' (1971) 80 Yale Law Journal 647, 667: 'our society is not – cannot sanely be – committed to preserving absolute and pristine environmental "purity" no matter what the cost'. Charles S Pearson, 'Testing the System: GATT+ PPP=?' (1994) 27 Cornell International Law Journal 553, 556:

generates a negative or positive externality, government should intervene to ensure that the agents 'internalise the externality'. In other words, government should aim to change the private cost-benefit functions of the agents so that they properly reflect the social costs or benefits of the activity. Government-intervention remedies may be further classified into two broad categories: 'command-and-control' regulation, and market-based remedies using taxes or subsidies.

In the paper mill case, the government could introduce so-called command-andcontrol regulation. This can take the form of a performance-based standard, which caps the amount of sludge produced by the mill (the economically efficient cap being R, for reasons discussed above), or a technology-based standard, which would require the mill to 'incorporate a certain level of technology that will reduce production of an unwanted pollutant'.<sup>15</sup>



Fig. 6-2

A second option – a so-called market-based remedy – would be for the government to tax sludge at B per unit as in Fig. 6-2 above. The mill would then have an incentive to reduce its sludge output to R, because at any point to the right of R, it is more economical to abate than to pay the tax (the tax schedule given by the horizontal line

<sup>&#</sup>x27;Meade, Bees, and Externalities' (1973) 16(1) *Journal of Law & Economics* 35, 35, citing Henry Sidgwick, *The Principles of Political Economy* (3rd edn, Macmillan 1901) 406.

<sup>&</sup>lt;sup>15</sup> Jonathan Remy Nash, 'Too Much Market? The Conflict between Tradeable Pollution Allowances and the "Polluter Pays" Principle' (2000) 24(2) Harvard Environmental Law Review 465, 481.

BR' is higher than the mill's abatement cost curve MAC). There is also no reason for the mill to reduce its sludge output below R (which would also be economically suboptimal), because to the left of R, it is more economical to pay the tax than to abate (MAC is higher than BR').

A third option – also a market-based remedy – would be for the government to pay the mill a subsidy of *B* for each unit of sludge reduction. Again, the mill would have an incentive to reduce its sludge output to *R*, because at any point to the right of *R*, the subsidy more than compensates for the abatement cost (the subsidy schedule BR' is higher than its abatement cost curve MAC).<sup>16</sup>

Command-and-control, taxes and subsidies are not mutually exclusive. For instance, Pezzey's economic treatment of market mechanisms for pollution control (such as pollution taxes, subsidies and tradable permits) notes that it is 'generally recognised that controlling pollution by price alone may well not protect the environment adequately from abnormally high pollution loads',<sup>17</sup> and his analysis assumes that market mechanisms would, in practice, be accompanied by command-and-control-style regulatory limits.<sup>18</sup>

### 6.2.3 Valuation choices in government intervention

The key point for the purposes of this chapter – and one that is often glossed over in theoretical comparisons of approaches to mitigating pollution and other negative externalities – is that while any of these government-intervention remedies can, in theory, force or incentivise agents to produce an 'efficient' level of pollution, their *practical* implementation requires the government to engage with valuation choices.

Both command-and-control and market-based remedies require the government to know, or at least to be able to estimate, the efficient level of pollution (R), because that

<sup>&</sup>lt;sup>16</sup> For a comprehensive analysis and comparison of command-and-control, taxes, subsidies and other instruments of global environmental regulation, see Jonathan Baert Wiener, 'Global Environmental Regulation: Instrument Choice in Legal Context' (1998) 108(4) Yale Law Journal 677.

<sup>&</sup>lt;sup>17</sup> Pezzey (n 11) 191.

<sup>&</sup>lt;sup>18</sup> ibid.

is what determines the appropriate cap (for command-and-control regulation) or the level of tax or subsidy (for market-based remedies). In Fig. 6-2, *R* is the point where the *MAC* and *MEC* curves intersect,<sup>19</sup> and it cannot be calculated without knowing the shape of the *MEC* curve. Since the *MEC* curve represents the marginal environmental cost of each unit of sludge, it can only be approximated by putting a monetary value on the estimated environmental damage caused by sludge. This exercise, evidently, requires the regulator to determine what constitutes pollution (the second valuation choice, relating to scope) as well as how to measure the damage caused by such pollution (the third valuation choice, relating to methodology).

# 6.2.4 Bargaining-based remedies

In his seminal 1960 article,<sup>20</sup> Ronald Coase challenged the idea that the presence of externalities requires or justifies government intervention. His challenge was twofold, directed at the standard framing of the problem, and also at the policy implications purportedly suggested by the theory.

First, Coase argued that the standard approach – the government-intervention approach discussed above – frames the harm or benefit as unidirectional, whereas the problem is in fact reciprocal in nature:

The question is commonly thought of as one in which A inflicts harm on B and what has to be decided is: how should we restrain A? But this is wrong. We are dealing with a problem of a reciprocal nature. To avoid the harm to B would inflict harm on A. The real question that has to be decided is: should A be allowed to harm B or should B be allowed to harm A?<sup>21</sup>

On this view, just as downstream users are harmed if the mill is allowed to produce sludge, so too the mill is harmed if downstream users restrict it from producing

<sup>&</sup>lt;sup>19</sup> To be precise, *R* is the abscissa of the point of intersection of the *MAC* and *MEC* curves.

<sup>&</sup>lt;sup>20</sup> RH Coase, 'The Problem of Social Cost' (1960) 3 Journal of Law and Economics 1.

<sup>&</sup>lt;sup>21</sup> ibid 2.

paper. Harm is inevitable; the problem, as Coase put it, 'is to avoid the more serious harm'.<sup>22</sup>

Second, Coase argued that the standard approach assumed 'a regime of zero transaction costs',<sup>23</sup> and that, under this assumption, even with *no* government intervention, bargaining between the parties will lead to an efficient (wealth-maximising) outcome, regardless of how rights were initially assigned.<sup>24</sup> This is the basic proposition which Stigler christened 'the Coase theorem'.<sup>25</sup>

This insight has led some economists to favour bargaining-based remedies over government intervention, citing perceived drawbacks of the latter, such as lack of

In order to carry out a market transaction it is necessary to discover who it is that one wishes to deal with, to inform people that one wishes to deal and on what terms, to conduct negotiations leading up to a bargain, to draw up the contract, to undertake the inspection needed to make sure that the terms of the contract are being observed, and so on.

Coase (n 20) 15. For a more detailed treatment, see Douglas W Allen, 'Transaction Costs' in Boudewijn Bouckaert and Gerrit De Geest (eds), *The Encyclopedia of Law and Economics* (Edward Elgar 2000) 893.

<sup>24</sup> Coase (n 20) 2–8.

<sup>25</sup> 'The Coase theorem ... asserts that under perfect competition private and social costs will be equal.' George J Stigler, *The Theory of Price* (3rd edn, Macmillan 1966) 113. See also Coase's own summary:

What I showed in ['The Problem of Social Cost'], as I thought, was that in a regime of zero transaction costs, ... negotiations between the parties would lead to those arrangements being made which would maximize wealth and this irrespective of the initial assignment of rights. This is the infamous Coase theorem, named and formulated by George Stigler, although it is based on work of mine.

RH Coase, 'The Institutional Structure of Production' (1992) 82(4) *American Economic Review* 713, 717. For a survey of various other formulations of the Coase theorem, and of the vast literature stemming from the theorem generally, see Steven G Medema and Richard O Zerbe, Jr, 'The Coase Theorem' in Boudewijn Bouckaert and Gerrit De Geest (eds), *The Encyclopedia of Law and Economics* (Edward Elgar 2000) 836.

<sup>&</sup>lt;sup>22</sup> ibid.

<sup>&</sup>lt;sup>23</sup> RH Coase, 'Law and Economics at Chicago' (1993) 36(1, Part 2) *Journal of Law and Economics* 239, 252. In 'The Problem of Social Cost', Coase gave some examples of transaction costs:

centralised information, distorted incentives and susceptibility to lobbying.<sup>26</sup> Accordingly, they call for government to focus less on regulation, taxation or subsidies, and more on reducing transaction costs and clearly defining property rights.<sup>27</sup>

## 6.2.5 Drawbacks of bargaining-based remedies

These arguments notwithstanding, bargaining-based remedies have their own shortcomings. Critics point out that *real-world* externalities involve transaction costs, and that these are likely to prevent attainment of the social optimum which is theoretically possible with bargaining in idealised settings.<sup>28</sup> Behavioural economists have demonstrated that when there is a divergence between parties' willingness-to-accept and willingness-to-pay (which is often the case for goods with few substitutes, such as environmental amenities),<sup>29</sup> the outcome of the bargaining process is *not* invariant to the initial assignment of rights; in particular, 'the individual who is assigned the property right to a good will be more likely to retain it'.<sup>30</sup>

Bargaining-based remedies also ignore distributional effects. As Calabresi and Melamed put it, '[i]n a society which entitles Taney to make noise and which forces

<sup>&</sup>lt;sup>26</sup> See e.g. Barnett and Yandle (n 10) 149–50; Terry L Anderson, 'Donning Coase-Coloured Glasses: A Property Rights View of Natural Resource Economics' (2004) 48(3) Australian Journal of Agricultural and Resource Economics 445, 454; Terry L Anderson and Donald R Leal, Free Market Environmentalism (Palgrave 2001).

<sup>&</sup>lt;sup>27</sup> Cooter and Ulen propose the 'Normative Coase Theorem': 'Structure the law so as to remove the impediments to private agreements.' Robert Cooter and Thomas Ulen, *Law and Economics* (6th edn, Addison-Wesley 2016) 92.

<sup>&</sup>lt;sup>28</sup> See e.g. Medema and Zerbe (n 25) 861, criticising Elizabeth Hoffman and Matthew L Spitzer, 'Experimental Tests of the Coase Theorem with Large Bargaining Groups' (1986) 15(1) *Journal of Legal Studies* 149, 151.

<sup>&</sup>lt;sup>29</sup> Daniel S Levy and David Friedman, 'The Revenge of the Redwoods? Reconsidering Property Rights and the Economic Allocation of Natural Resources' (1994) 61(2) *University of Chicago Law Review* 493; W Michael Hanemann, 'Willingness to Pay and Willingness to Accept: How Much Can They Differ?' (1991) 81 *American Economic Review* 635.

<sup>&</sup>lt;sup>30</sup> Daniel Kahneman, Jack L Knetsch and Richard H Thaler, 'Experimental Tests of the Endowment Effect and the Coase Theorem' (1990) 98(6) *Journal of Political Economy* 1325, 1340.

Marshall to buy silence from Taney, Taney is wealthier and Marshall poorer than each would be in a society which had the converse set of entitlements.<sup>'31</sup>

In our example, if the downstream users have property rights, the mill has to pay them a fee for the right to pollute. On the other hand, if the paper mill has property rights over the river, the downstream users have to pay the mill not to pollute, which enriches the mill. This is a cause for concern, at least for those who believe that law should be concerned not just with wealth-maximisation but with also equitable distribution.<sup>32</sup>

Coase himself recognised that in some settings – he specifically used the example of 'smoke nuisance, [where] a large number of people are involved'<sup>33</sup> – government intervention may be preferable to bargaining-based remedies, with all their attendant problems of costly negotiations, incomplete information, free-riding, etc. It is therefore no surprise that legal remedies for large-scale environmental pollution have come to rely primarily on government intervention – grounded in economic theory, and often characterised as a manifestation of the Polluter Pays Principle.

# 6.3 Legal foundations

### 6.3.1 International law

While the origins of the Polluter Pays Principle, as discussed in the foregoing section, lie in economic theory, the first appearance of the principle in a *legal* context was in a 1972 recommendation by the OECD. The relevant passage stated:

The principle to be used for allocating costs of pollution prevention and control measures to encourage rational use of scarce environmental resources and to avoid distortions in international

<sup>&</sup>lt;sup>31</sup> Guido Calabresi and A Douglas Melamed, 'Property Rules, Liability Rules, and Inalienability: One View of the Cathedral' (1972) 85(6) *Harvard Law Review* 1089, 1095.

<sup>&</sup>lt;sup>32</sup> Michael I Swygert and Katherine Earle Yanes, 'A Unified Theory of Justice: The Integration of Fairness into Efficiency' (1998) 73(2) *Washington Law Review* 249. See however Richard A Posner, *The Economics of Justice* (Harvard University Press 1983) 115: 'the criterion for judging whether acts and institutions are just or good is whether they maximize the wealth of society'.

<sup>&</sup>lt;sup>33</sup> Coase (n 20) 18.

trade and investment is the so-called "Polluter-Pays Principle". This principle means that the polluter should bear the expenses of carrying out the above-mentioned measures decided by public authorities to ensure that the environment is in an acceptable state. In other words, the cost of these measures should be reflected in the cost of goods and services which cause pollution in production and/or consumption.<sup>34</sup>

While the OECD 1972 Recommendation was merely 'a statement of environmental principles and goals for the international community' and 'did not purport to be binding international law',<sup>35</sup> over the next three decades, the Polluter Pays Principle, due in large part to the efforts of the OECD and the European Commission,<sup>36</sup> was transformed from 'a mere economic rule into a true legal principle'.<sup>37</sup> The principle is now invoked in a number of multilateral conventions – sometimes as an interpretive principle in the preamble, but in other cases as a binding principle in an operative provision.<sup>38</sup> It has found a place, albeit in 'aspirational rather than obligatory terms',<sup>39</sup> in the 1992 Rio Declaration which states that:

National authorities should endeavour to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to

<sup>37</sup> de Sadeleer (n 3) 26.

<sup>&</sup>lt;sup>34</sup> OECD 1972 Recommendation (n 5) Annex para 4. For a potted history of the Polluter Pays Principle with particular reference to the role of the OECD, see Nash (n 15) 468–72; Ursula Kettlewell, 'The Answer to Global Pollution: A Critical Examination of the Problems and Potential of the Polluter-Pays Principle' (1992) 3 *Colorado Journal of International Environmental Law & Policy* 429, 433–36.

<sup>&</sup>lt;sup>35</sup> Nash (n 15) 469.

<sup>&</sup>lt;sup>36</sup> On the role of the European Commission in the development and acceptance of the Polluter Pays Principle, see Arne Bleeker, 'Does the Polluter Pay? The Polluter-Pays Principle in the Case Law of the European Court of Justice' (2009) 18 European Energy and Environmental Law Review 289, 291–92; Sadeleer (n 3) 27–32; Philippe Sands and Jacqueline Peel, Principles of International Environmental Law (4th edn, Cambridge University Press 2018) 242–43.

<sup>&</sup>lt;sup>38</sup> For a list of such instruments, see de Sadeleer (n 3) 23–26; Sands and Peel (n 36) 243.

<sup>&</sup>lt;sup>39</sup> Alan E Boyle and David Freestone, International Law and Sustainable Development: Past Achievements and Future Challenges (Oxford University Press 1999) 4.

the public interest and without distorting international trade and investment.<sup>40</sup>

Finally, in many jurisdictions including India, the Polluter Pays Principle has also been incorporated into domestic law.<sup>41</sup>

# 6.3.2 Indian law

In India, the Polluter Pays Principle was incorporated into law not by statute, but through a series of Supreme Court decisions. *MC Mehta v Union of India ('Oleum* case')<sup>42</sup> is regarded as an early, 'indirect recognition and application' of the principle.<sup>43</sup> The case involved leakage of oleum gas from one of the units of a food and fertiliser plant in Delhi. One person died and several others were affected as a result of inhaling the gas.<sup>44</sup>

The *Oleum* case is most notable for the formulation, by the Supreme Court's fivejudge Constitution Bench, of the principle of 'absolute liability':

[W]here an enterprise is engaged in a hazardous or inherently dangerous activity and harm results to anyone on account of an accident in the operation of such hazardous or inherently dangerous activity ... the enterprise is strictly and absolutely liable to compensate all those who are affected by the accident and such liability is not subject to any of the exceptions which operate vis-a-vis the tortious principle of strict liability under the rule in *Rylands v. Fletcher.*<sup>45</sup>

<sup>&</sup>lt;sup>40</sup> Rio Declaration on Environment and Development (14 June 1992) UN Doc A/CONF.151/26 (Vol I), (1992) 31 ILM 874, Principle 16.

<sup>&</sup>lt;sup>41</sup> See de Sadeleer (n 3) 32–33 for a brief account of the principle's 'significant influence on the evolution of national law'.

<sup>&</sup>lt;sup>42</sup> AIR 1987 SC 1086.

 <sup>&</sup>lt;sup>43</sup> Satish C Shastri, "The Polluter Pays Principle" and the Supreme Court of India' 42(1) (2000) *Journal of the Indian Law Institute* 108, 109.

<sup>&</sup>lt;sup>44</sup> *Oleum* case (n 42) [1].

<sup>&</sup>lt;sup>45</sup> ibid [31], citing *Rylands v Fletcher* [1868] LR 3 HL 330. The exceptions in *Rylands v Fletcher* include natural use of the land, plaintiff's default and act of God. ibid 338–40.

Although the *Oleum* case involved a human health hazard rather than environmental damage *per se*, and although it did not explicitly use the phrase 'polluter pays principle', it paved the way for the subsequent incorporation of the principle in *Indian Council for Enviro-Legal Action v Union of India ('Enviro-Legal Action')*.<sup>46</sup>

*Enviro-Legal Action* involved chemical industries in Rajasthan which were operating without requisite government consents and illegally disposing of highly toxic sludge. The waste matter had contaminated the subterranean aquifer, made water in the surrounding village wells unfit for human or animal consumption, rendered the soil unfit for cultivation and caused illness among the villagers.

The Supreme Court's judgment quoted a report by the National Environmental Engineering Research Institute ('NEERI'), prepared pursuant to an earlier order of the Supreme Court.<sup>47</sup> The NEERI Report estimated the cost of damage and suggested that it 'needs to be borne by the management of the industry in keeping with the Polluter Pays principle' and the doctrine of strict/absolute liability as applied in the *Oleum* case.<sup>48</sup> Seemingly in agreement, the court went on to hold that the Polluter Pays Principle 'which has now come to be accepted universally as a sound principle' was relevant in determining the liability of the respondents.<sup>49</sup> It referred to the OECD's role in developing the principle and its subsequent adoption by the EC,<sup>50</sup> and interpreted the *Oleum* decision as an endorsement of the Polluter Pays Principle.<sup>51</sup>

This gradual trajectory towards increasing acceptance of the Polluter Pays Principle into Indian environmental jurisprudence culminated in *Vellore*. Like the *Oleum* case and *Enviro-Legal Action* which came before, *Vellore* was the result of a public interest

<sup>&</sup>lt;sup>46</sup> AIR 1996 SC 1446.

<sup>&</sup>lt;sup>47</sup> ibid [16].

<sup>&</sup>lt;sup>48</sup> ibid [38], citing National Environmental Engineering Research Institute, 'Restoration of Environmental Quality of the Affected Area Surrounding Village Bichhri Due to Past Waste Disposal Activities' (1994) para 7.4.

<sup>&</sup>lt;sup>49</sup> Enviro-Legal Action (n 46) [67].

<sup>&</sup>lt;sup>50</sup> ibid.

<sup>&</sup>lt;sup>51</sup> '[T]he principle "Polluter Pays" ... is stated in absolute terms in Oleum Gas Leak Case'. ibid [69]. This, however, is questionable; as noted earlier, the phrase 'polluter pays' was never used in the *Oleum* decision.

petition to the Indian Supreme Court.<sup>52</sup> The petition pertained to discharge of untreated effluent by tanneries and other industries in Tamil Nadu. The effluent contaminated wells, waterways, agricultural fields and the river Palar, resulting in non-availability of drinking water to residents of the area.

In holding the industries liable, the court held that sustainable development has been accepted as a part of customary international law,<sup>53</sup> and that, based on the Brundtland Report 'and other international documents', the Polluter Pays Principle is one of its

<sup>&</sup>lt;sup>52</sup> On public interest litigation in India, see e.g. PN Bhagwati, 'Judicial Activism and Public Interest Litigation' (1984) 23(3) Columbia Journal of Transnational Law 561; Clark D Cunningham, 'Public Interest Litigation in the Indian Supreme Court: A Study in the Light of American Experience' (1987) 29(4) Journal of the Indian Law Institute 494; Jamie Cassels, 'Judicial Activism and Public Interest Litigation in India: Attempting the Impossible?' (1989) 37(3) American Journal of Comparative Law 49; Francis Xavier Rathinam and A V Raja, 'Courts as Regulators: Public Interest Litigation in India' (2011) 16(2) Environment and Development Economics 199; Zachary Holladay, 'Public Interest Litigation in India as a Paradigm for Developing Nations' (2012) 19(2) Indiana Journal of Global Legal Studies 555; Anuj Bhuwania, 'Courting the People: The Rise of Public Interest Litigation in Post-Emergence India' (2014) 34(2) Comparative Studies of South Asia, Africa and the Middle East 314. For a more critical perspective, see Lavanya Rajamani, 'Public Interest Environmental Litigation in India: Exploring Issues of Access, Participation, Equity, Effectiveness and Sustainability' (2007) 19(3) Journal of Environmental Law 293; Surya Deva, 'Public Interest Litigation in India: A Critical Review' (2009) 28 Civil Justice Quarterly 19; Shyam Divan, 'Public Interest Litigation' in Sujit Choudhry, Madhav Khosla and Pratap Bhanu Mehta (eds), The Oxford Handbook of the Indian Constitution (Oxford University Press 2016) 662; Hajime Sato, 'The Universality, Peculiarity, and Sustainability of Indian Public Interest Litigation Reconsidered' (2017) 100 World Development 59. On judicial activism in India generally, see SP Sathe, Judicial Activism in India: Transgressing Borders and Enforcing Limits (Oxford University Press 2003).

<sup>&</sup>lt;sup>53</sup> Vellore (n 8) [10]. In 2004, eight years after Vellore, Sands wrote that '[i]t is doubtful whether [the Polluter Pays Principle] has achieved the status of a generally applicable rule of customary international law, except perhaps in relation to states in the EC, the UNECE and the OECD'. Philippe Sands, Principles of International Environmental Law (2nd edn, Cambridge University Press 2003) 280. However, this sentence was dropped in the 3rd and 4th editions of the book, which merely note that the principle 'has not received the same degree of support' as the principle of preventative action or the precautionary principle. Philippe Sands and Jacqueline Peel, Principles of International Environmental Law (3rd edn, Cambridge University Press 2012) 229; Sands and Peel 2018 (n 36) 240.

'essential features'.<sup>54</sup> Citing *Enviro-Legal Action's* endorsement of the Polluter Pays Principle as a 'sound principle',<sup>55</sup> and various constitutional and legislative provisions, the court unequivocally declared that the Polluter Pays Principle – as well as the precautionary principle – are 'part of the law of the land'.<sup>56</sup>

More recently, the Polluter Pays Principle has been given statutory recognition. The NGT was established in 2010 as an independent tribunal responsible for adjudicating environmental natural resource conservation cases,<sup>57</sup> and its constituting statute provides that 'the Tribunal shall, while passing any order or decision or award, apply the principles of sustainable development, the precautionary principle and the polluter pays principle'.<sup>58</sup>

To summarise, the *Oleum case* (1987) introduced the principle of absolute liability. Relying on that decision and the NEERI Report, in *Enviro-Legal Action* (1996), the Supreme Court held that the Polluter Pays Principle is relevant to determination of environmental liability. Later that year, in *Vellore* (1996), the court went a step further, holding that the Polluter Pays Principle is part of the law of the land, which paved the way for statutory recognition of the principle in the NGT Act, 2010.

What is less clear, unfortunately, are the 'precise contours'<sup>59</sup> of the principle. To use the 'valuation choice' terminology, the 'step zero' question (whether to use monetary valuation) is answered in the affirmative by the assumption that if the polluter is found liable, the application of the principle will lead to a quantified damage award.

<sup>&</sup>lt;sup>54</sup> Vellore (n 8) [11]. Other 'salient principles' of sustainable development enumerated by the court include inter-generational equity, use and conservation of natural resources, environmental protection and the precautionary principle.

<sup>&</sup>lt;sup>55</sup> ibid [12], citing *Enviro-Legal Action* (n 46) [67].

<sup>&</sup>lt;sup>56</sup> ibid [13].

<sup>&</sup>lt;sup>57</sup> On the NGT generally, see Domenico Amirante, 'Environmental Courts in Comparative Perspective: Preliminary Reflections on the National Green Tribunal of India' (2011) 29(2) Pace Environmental Law Review 441; Gitanjali Nain Gill, Environmental Justice in India: The National Green Tribunal (Routledge 2017).

<sup>&</sup>lt;sup>58</sup> NGT Act, s 20.

<sup>&</sup>lt;sup>59</sup> Nash (n 15) 472 (Nash uses the phrase in a general discussion of the principle, not specifically in the Indian context).

However, there is considerable ambiguity with respect to the other two valuation choices, namely the scope of the principle and the valuation methodology to be employed. Indeed, this ambiguity has been acknowledged by the court itself. From the beginning of this process of integration – as far back as *Enviro-Legal Action* where the Supreme Court first used the phrase 'polluter pays principle' – the court has recognised that:

there has been considerable discussion of the nature of the polluter pays principle, but the precise scope of the principle and its implications for those involved in ... polluting activities have never been satisfactory agreed.<sup>60</sup>

Thus, despite the Polluter Pays Principle's widespread acceptance and apparent simplicity, its precise legal content and implications remain elusive and shrouded in ambiguity – a fact noted by almost all its commentators.<sup>61</sup> The diverse interpretations have led Bugge to suggest that '[i]t may even be more adequate to describe the principle in plural, as "polluter pays *principles*", although with connections and overlaps, and a common core.'<sup>62</sup> Indeed, Stevens concludes that the principle 'has come to mean all things to all people, and, in this, it has been rendered somewhat meaningless.'<sup>63</sup>

In this chapter, I am principally interested in the question of valuation, that is, the determination of how much the polluter should pay. This is just one of the many

<sup>&</sup>lt;sup>60</sup> Enviro-Legal Action (n 46) [67].

<sup>&</sup>lt;sup>61</sup> See e.g. de Sadeleer (n 3) 33 (remarking that its 'apparent simplicity ... masks a number of ambiguities and its outlines continue to be poorly defined at the legal level'); Nash (n 15) 472 ('The precise contours and breadth of the polluter pays principle remain unclear.'); Sumudu A Atapattu, Emerging Principles of International Environmental Law (Transnational Publishers 2006) 439 ('The exact definition of the polluter pays principle is subject to some controversy.'); Pearson (n 12) 554 (noting its 'ambiguities and idiosyncratic interpretations'); Bleeker (n 36) 293 (describing it as 'easy to look at but hard to apply').

<sup>&</sup>lt;sup>62</sup> Hans Christian Bugge, 'The Polluter Pays Principle: Dilemmas of Justice in National and International Contexts' in Jonas Ebbesson and Phoebe Okowa (eds), *Environmental Law and Justice in Context* (Cambridge University Press 2009) 411, 413.

<sup>&</sup>lt;sup>63</sup> Candice Stevens, 'Interpreting the Polluter Pays Principle in the Trade and Environment Context' (1994) 27(3) *Cornell International Law Journal* 577, 577.

ambiguous aspects of the principle, but also one of the most important and controversial.<sup>64</sup> With Bleeker, I believe that 'courts have an essential role to fulfil in clarifying the status and the scope of the principle.'<sup>65</sup> Therefore, in the next two sections, I examine how Indian courts have interpreted and applied the Polluter Pays Principle, and in particular, how they have approached the problem of quantification and valuation choices. In particular, section 6.4 focuses on the scope choice, and 6.5 on the methodology choice.

### 6.4 Valuation under Polluter Pays: Scope

#### 6.4.1 Content

The question at the heart of this chapter – that of how much the polluter should pay – may at first glance seem like a problem of quantification. But before the costs are quantified, it is important to address the scope choice, that is, to ask what costs are included within the principle.<sup>66</sup>

Payments under the Polluter Pays Principle can be classed under several categories. The two most common categories in Indian case law are restoration costs for environmental damage *per se*, and compensation to human victims of pollution. Thus, in *Enviro-Legal Action*, the chemical industries were held liable:

to compensate for the harm caused by them to villagers in the affected area, to the soil and to the underground water ... to take all necessary measures to remove the sludge and other pollutants lying

<sup>&</sup>lt;sup>64</sup> Schwartz regards quantification as one of the three concepts that 'form the bedrock of the principle' (the other two being identifying the polluter, and how they can be made to pay). Priscilla Schwartz, 'The Polluter-Pays Principle' in Malgosia Fitzmaurice, David Ong and Panos Merkouris (eds), *Research Handbook on International Environmental Law* (Edward Elgar 2010) 247. Likewise, according to de Sadeleer, the 'main analytical controversies' surrounding the principle are 'on one hand the function of the principle, and on the other hand identification of the polluter and *what he must pay*.' de Sadeleer (n 3) 33 (emphasis added).

<sup>65</sup> Bleeker (n 36) 289.

<sup>&</sup>lt;sup>66</sup> Sanford E Gaines, 'The Polluter-Pays Principle: From Economic Equity to Environmental Ethos' (1991) 26(3) *Texas International Law Journal* 463, 473: 'Defining what the polluter should pay for raises myriad subsidiary questions. ... [T]he question can be rephrased to ask what costs are included within the principle.'

in the affected area ... and also to defray the cost of the remedial measures required to restore the soil and the underground water sources.<sup>67</sup>

Likewise, in *Vellore*, the tanneries were held liable for compensation to 'individual sufferers as well as the cost of reversing the damaged ecology',<sup>68</sup> and in *S Jagannath v Union of India ('Jagannath')* – a case where intensive and semi-intensive prawn farming in ecologically fragile coastal areas led to destruction of mangrove habitat and biodiversity, salinisation of farmland and well-water, effluent pollution and other negative impacts on the environment – compensation was again awarded under two heads: reversing the damaged ecology and payment to affected individuals.<sup>69</sup>

The Supreme Court clarified the scope of environmental compensation in *Research Foundation for Science Technology and Natural Resources Policy v Union of India ('Waste Oil* case').<sup>70</sup> The case involved illegally imported waste oil, which was found to be hazardous to the environment under the Hazardous Wastes (Management and Handling) Rules, 1989. The court-appointed expert committee recommended that the oil be incinerated in a way that would have no negative impact on the environment,<sup>71</sup> and the court held that the importers were liable under the Polluter Pays Principle to pay for such disposal.<sup>72</sup>

In reaching its decision, the Supreme Court held that the importers could not escape liability on the basis that the waste oil had not *yet* caused any environmental damage; the Polluter Pays Principle covers not just liability for remedying environmental damage that has already occurred, but also 'cost incurred in *avoiding* pollution'.<sup>73</sup> It

- <sup>69</sup> AIR 1997 SC 811 [12].
- <sup>70</sup> (2005) 10 SCC 510.
- <sup>71</sup> ibid [13], [35].

<sup>73</sup> ibid [27] (emphasis added).

<sup>&</sup>lt;sup>67</sup> Enviro-Legal Action (n 46) [66].

<sup>&</sup>lt;sup>68</sup> Vellore (n 8) [12].

<sup>&</sup>lt;sup>72</sup> ibid [37].

includes 'full environmental cost' and not just costs which are 'immediately tangible'.<sup>74</sup>

More recently, the heads of compensation have been codified in the National Green Tribunal Act of 2010. Section 15 provides:

- 15 (1) The Tribunal may, by an order, provide,—
  - (a) relief and compensation to the victims of pollution and other environmental damage arising under the enactments specified in the Schedule I<sup>75</sup> (including accident occurring while handling any hazardous substance);
  - (b) for restitution of property damaged;
  - (c) for restitution of the environment for such area or areas,

as the Tribunal may think fit.

(4) The Tribunal may, having regard to the damage to public health, property and environment, divide the compensation or relief payable under separate heads specified in Schedule II76 so as to provide compensation or relief to the claimants and for restitution of the damaged property or environment, as it may think fit.

As noted in Section 6.3.2 above, the Tribunal is required, under Section 20 of the NGT Act, to apply the Polluter Pays Principle when making orders, including orders for compensation, relief and restitution under Section 15.

The scope of Section 15 was clarified by the NGT in *Forward Foundation v State of Karnataka ('Forward Foundation')*.<sup>77</sup> The dispute involved commercial projects (including a business park, hotels, residential apartments and a mall) which were located in an ecologically sensitive area between Agara and Bellandur Lakes in the

<sup>&</sup>lt;sup>74</sup> ibid.

<sup>&</sup>lt;sup>75</sup> Schedule I lists seven environmental acts in respect of which the NGT has jurisdiction.

<sup>&</sup>lt;sup>76</sup> Schedule II lists the heads under which compensation or relief for damage may be claimed, which include harm to individuals (such as death, disability, injury or sickness), damages to private property, compensation for environmental degradation and restoration of the quality of environment, and claims for damage to flora, fauna and the environment in general.

<sup>&</sup>lt;sup>77</sup> MANU/GT/0089/2015 (NGT 7 May 2015).

state of Karnataka, and whose construction had commenced much before the grant of environmental clearance. In holding the project proponents liable, the NGT held that the 'plain language' of Section 15 contains nothing to suggest that it 'can be invoked only post event'.<sup>78</sup> Rather, it applies 'both to a damage that has occurred as well as the damage which is *likely to occur* in relation to a property or environment'.<sup>79</sup>

#### 6.4.2 Justifications

In determining the scope of the Polluter Pays Principle and what costs are included within it, courts have relied on principles which track the philosophical justifications of tort law, once again highlighting the importance of context in judicial valuation – a recurrent idea in this thesis. Tort law justifications are commonly classified into *corrective-justice theories*, which hold that the purpose of tort law is 'to see to it that the wrongful injuring of the plaintiff is corrected',<sup>80</sup> *responsibility-based theories*, which rest 'on the defendant's *being responsible* for having injured the plaintiff'<sup>81</sup> and *efficient-deterrence theories* which are based on economic theory and a view of tort law as an instrument of 'optimal deterrence' which maximises social welfare.<sup>82</sup> All three of

<sup>&</sup>lt;sup>78</sup> ibid [39].

<sup>&</sup>lt;sup>79</sup> Ibid (emphasis added).

<sup>&</sup>lt;sup>80</sup> John CP Goldberg and Benjamin C Zipursky, 'Tort Law and Responsibility' in John Oberdiek (ed), *Philosophical Foundations of the Law of Torts* (Oxford University Press 2014) 25. Here, Goldberg and Zipursky are simply describing corrective-justice theories; they themselves advocate what they call 'civil recourse theory', a form of responsibility-based theory. ibid 26–35. For corrective-justice theories, see Richard A Epstein, 'A Theory of Strict Liability' (1972) 2(1) *Journal of Legal Studies* 151; Jules L Coleman, *Risks and Wrongs* (Oxford University Press 1992) 197–385; Ernest J Weinrib, *The Idea of Private Law* (Harvard University Press 1995).

<sup>&</sup>lt;sup>81</sup> Goldberg and Zipursky (n 80) 19. See also HLA Hart and Tony Honoré, *Causation in the Law* (2nd edn, Clarendon Press 1985); Stephen R Perry, 'Responsibility for Outcomes, Risk, and the Law of Torts' in Gerald Postema (ed), *Philosophy and the Law of Torts* (Cambridge University Press 2001) 72.

<sup>&</sup>lt;sup>82</sup> See e.g. Guido Calabresi, 'Some Thoughts on Risk Distribution and the Law of Torts' (1960) 70(4) Yale Law Journal 499; Richard A Posner, 'A Theory of Negligence' (1972) 1(1) Journal of Legal Studies 29; William M Landes and Richard A Posner, The Economic Structure of Tort Law (Harvard University Press 1987). For a 'mixed theory', see Gary T Schwartz, 'Mixed Theories of Tort Law: Affirming both Deterrence and Corrective Justice' (1996) 75(7) Texas Law Review 1801.

these justifications, in various forms, are in evidence in Indian court decisions relating to the Polluter Pays Principle.

The corrective-justice aspects of the Polluter Pays Principle are most obviously reflected in payments for environmental restoration and compensation to individuals as discussed above. In *Enviro-Legal Action*, the court used corrective-justice language when referring to the responsibility of an enterprise which is carrying on a hazardous or inherently dangerous activity 'to *make good the loss* caused to any other person' by such activity.<sup>83</sup> Likewise in *MC Mehta v Kamal Nath ('Kamal Nath II')*, the court held that 'the wrongdoer, the polluter, is under an obligation to *make good the damage* caused to the environment.'<sup>84</sup>

*Enviro-Legal Action* also included a responsibility-based justification, where the court noted that a number of earlier orders passed by the court in relation to the case 'are premised upon the finding that the respondents are *responsible for* the said pollution',<sup>85</sup> and it was 'only because of the said reason' that the respondents were asked to defray the cost of removal and storage of sludge.<sup>86</sup>

Finally, in the *Oleum* case, the court held that the measure of compensation in absolute liability cases 'must have a deterrent effect'.<sup>87</sup> The court's reasoning was not explicitly economic, but that is not a prerequisite for efficient-deterrence theories; indeed, one of the core claims of the Law and Economics movement is that the logic underlying much of the common law is implicitly – perhaps even unconsciously – based on promoting efficiency and wealth-maximisation.<sup>88</sup>

<sup>&</sup>lt;sup>83</sup> Enviro-Legal Action (n 46) [65] (emphasis added), citing Oleum case (n 42).

<sup>&</sup>lt;sup>84</sup> AIR 2000 SC 1997 [10].

<sup>&</sup>lt;sup>85</sup> Enviro-Legal Action (n 46) [57] (emphasis added).

<sup>&</sup>lt;sup>86</sup> ibid.

<sup>&</sup>lt;sup>87</sup> Oleum case (n 42) [32].

See e.g. Richard A Posner, 'The Economic Approach to Law' (1975) 53 *Texas Law Review* 757, arguing that there is 'a good deal of *implicit* economic analysis in legal thought' (ibid 762, emphasis added), that 'the legal system ... has been strongly influenced by a concern (*more often implicit than explicit*) with promoting economic efficiency' (ibid 763–64, emphasis added), and that 'the participants in the legal process indeed behave *as if* they

Deterrence reasoning is also in evidence in the court's occasional decision to award exemplary damages. One such case was *MC Mehta v Kamal Nath ('Kamal Nath III')*,<sup>89</sup> involving the construction of a motel on ecologically fragile land, diversion of the river Beas through construction of walls and embankments, and interference with the ecology of the area. Although Span Motels, the company responsible for the construction, had already been ordered, in a previous judgment, to pay for the restitution of the ecology of the area,<sup>90</sup> it was subsequently also held liable for exemplary damages 'so that it may act as a deterrent for others not to cause pollution in any manner'.<sup>91</sup>

In addition, the courts have also occasionally displayed what Keating calls a *social contract conception* of tort law.<sup>92</sup> In the *Oleum* case, for example, the court held that if an enterprise is permitted to carry on a hazardous or inherently dangerous activity for profit, 'the law must presume that such permission is *conditional on* the enterprise absorbing the cost of any accident arising on account of such ... activity as an appropriate item of its over-heads'.<sup>93</sup> This fits neatly with Keating's conception of strict liability, where 'the payment of damages to those injured by the characteristic risks of an activity is *a condition for* the legitimate conduct of an activity'.<sup>94</sup>

### 6.4.3 Ex ante *or* ex post *costs*

Another long-standing 'scope' question regarding the Polluter Pays Principle relates to whether it includes *ex ante* costs (such as costs of avoiding future pollution), *ex post* 

<sup>94</sup> Keating (n 92) 30.

were rational maximizers' (ibid 763, emphasis added). On the Law and Economics movement in general, see Richard A Posner, 'The Law and Economics Movement' (1987) 77(2) *American Economic Review* 1; Herbert Hovenkamp, 'The First Great Law & Economics Movement' (1990) 42(4) *Stanford Law Review* 993; Coase (n 23).

<sup>&</sup>lt;sup>89</sup> AIR 2002 SC 1515.

<sup>&</sup>lt;sup>90</sup> MC Mehta v Kamal Nath (1997) 1 SCC 388 ('Kamal Nath I') [32].

<sup>&</sup>lt;sup>91</sup> Kamal Nath III (n 89) [4], [8], citing Kamal Nath II (n 84) [24].

<sup>&</sup>lt;sup>92</sup> Gregory C Keating, 'A Social Contract Conception of the Tort Law of Accidents' in Gerald Postema (ed), *Philosophy and the Law of Torts* (Cambridge University Press 2001) 22.

<sup>&</sup>lt;sup>93</sup> Oleum case (n 42) [31]. According to the court, absolute liability is 'part of the social cost for carrying on the hazardous or inherently dangerous activity'. ibid.

costs (such as costs of remediation of and compensation for past environmental damages), or both. Scholarly opinion on the subject is divided, but courts have to contend with the question because it is essential to determining the scope of valuation.

Atapattu clearly conceives of the Polluter Pays Principle as operating *ex ante* when she writes that:

the idea behind the polluter pays principle is to *avoid* environmental damage by ensuring that pollution remains at an acceptable level. Liability for environmental damage, although interrelated, is not the same as the polluter pays principle and occurs only after environmental damage has taken place. ... Thus, the polluter pays principle is not the same as paying compensation for environmental damage.<sup>95</sup>

Likewise, Kettlewell characterises the Polluter Pays Principle as 'a means of paying for the cost of pollution *prevention and control*',<sup>96</sup> and also for de Sadeleer, prevention and control is the principle's 'main function'.<sup>97</sup> Prevention is evidently an *ex ante* measure, and so is control, in the sense that it entails limiting the damage, as opposed to remedying or compensating for it.

On the other hand, Mamlyuk holds that 'the polluter pays principle is ... an ex post model'.<sup>98</sup> Yet another view suggests that the principle has both an *ex ante* and an *ex post* dimension. De Sadeleer's analysis of the functions of the Polluter Pays Principle identifies both *ex ante* internalisation and prevention elements and *ex post* curative elements 'guarantee[ing] the integrated reparation of damage'.<sup>99</sup> The OECD's own

<sup>&</sup>lt;sup>95</sup> Atapattu (n 61) 441 (emphasis added, internal citations omitted).

<sup>&</sup>lt;sup>96</sup> Kettlewell (n 34) 430 (emphasis added).

<sup>&</sup>lt;sup>97</sup> de Sadeleer (n 3) 35: 'The main function of the polluter-pays principle is to internalize the social costs borne by the public authorities for pollution prevention and control.' Of course, a 'main function' does not preclude other functions; see n 99 and accompanying text.

<sup>&</sup>lt;sup>98</sup> Boris N Mamlyuk, 'Analyzing the Polluter Pays Principle through Law and Economics' (2009) 18(1) Southeastern Environmental Law Journal 39, 57.

<sup>99</sup> de Sadeleer (n 3) 34, 44.

interpretation has shifted from a purely *ex ante* conception to one that also embraces *ex post* elements. Gaines regards the 1989 OECD Recommendation on Accidental Pollution<sup>100</sup> as a turning point: 'For the first time, the high priests of the [Polluter Pays Principle] have interpreted it to include an *ex post* obligation to pay for harms caused as well as the *ex ante* obligation to pay for preventive pollution control.'<sup>101</sup>

In the Indian context, the cases analysed in Section 6.3.2 above show that courts have mostly invoked the principle predominantly *ex post*, that is, after the pollution-causing event has taken place – examples include involved leakage of oleum gas from a food and fertiliser plant,<sup>102</sup> illegal disposal of toxic sludge by chemical industries<sup>103</sup> and discharge of untreated effluent by tanneries.<sup>104</sup> This is not surprising when we consider that most courts engage with the Polluter Pays Principle in a fundamentally different context than most legislators or regulators. The government-intervention remedies to externality problems outlined in Section 6.2.2 above – based on economic theory and justified using the Polluter Pays Principle – are essentially forward-looking. The goal is to prospectively identify the efficient level of pollution, and to put in place measures – standards, limits, taxes, subsidies – that seek to incentivise or force the polluter to abate to the efficient level.

Courts on the other hand generally get involved when there is an alleged *breach* of the prescribed standards or limits. Such a scenario, if breach is proved, calls for measures such as restoration or compensation to deal with damage that has already occurred. To put it differently, legislators and regulators are generally more concerned with setting the rules of the game, whereas courts generally come into the picture when the polluter does not play by the rules.

<sup>&</sup>lt;sup>100</sup> OECD, Recommendation of the Council concerning the Application of the Polluter-Pays Principle to Accidental Pollution (7 July 1989) C(89)88, (1989) 28 ILM 1320 ('OECD 1989 Recommendation').

<sup>&</sup>lt;sup>101</sup> Gaines (n 66) 482–83.

<sup>&</sup>lt;sup>102</sup> Oleum case (n 42).

<sup>&</sup>lt;sup>103</sup> Enviro-Legal Action (n 46).

<sup>&</sup>lt;sup>104</sup> Vellore (n 8)

However, as is often the case with valuation choices in court, the answer depends on the context. The *Waste Oil* case and *Forward Foundation*, both discussed in Section 6.4.1 above, furnish two examples of cases where there was a risk of future damage, which in turn impelled the court also to look to the future when it came to liability. In the former, the Supreme Court clarified that the Polluter Pays Principle covers not just costs of remedying damage that has already occurred but also costs of *avoiding* pollution,<sup>105</sup> while in the latter, the NGT held that Section 15 of the NGT Act – pertaining to relief, compensation and restitution, and statutorily required to be interpreted in light of the Polluter Pays Principle – applies not just to damage which has already occurred but also to damage which is *likely* to occur.<sup>106</sup> However it is noteworthy that in both these cases, the illegal *act* – importing hazardous waste oil (*Waste Oil* case) and construction without requisite environmental *effects* of the act lay in the future.

### 6.4.4 Standard versus Extended Polluter Pays Principle

Pezzey differentiates between *Standard PPP* which 'requires polluters to pay for controlling effluent down to the optimal ... load, but not for the environmental damage caused by the optimal effluent load', and *Extended PPP* where 'polluters must pay damage costs as well as control costs'.<sup>107</sup>

<sup>&</sup>lt;sup>105</sup> See n 73 and accompanying text.

<sup>&</sup>lt;sup>106</sup> See n 79 and accompanying text.

<sup>&</sup>lt;sup>107</sup> Pezzey (n 11) 193–94, with the following disclaimer: 'It is not suggested that this distinction can be applied rigidly in practice. It may not always be obvious what is the difference between a control cost, a prevention cost, a clean-up cost and a damage cost.' ibid 209.



Fig. 6-3

To return to the paper mill example, Standard PPP would require the mill to pay an amount represented by the triangle TRR' in Fig. 6-3, that is, the abatement cost incurred by the mill in reducing pollution to R. Extended PPP would require the paper mill to pay not just TRR' but also PRR' – not just the abatement cost of reducing pollution to R, but also the environmental cost resulting from the residual (unabated) pollution.

De Sadeleer makes a similar distinction between 'the polluter-pays principle in the strict sense, which is limited to a partial internalization of costs, and the principle defined in a wider sense, which corresponds to a full internalization of externalities',<sup>108</sup> the latter including not just the costs of pollution prevention and control but also the costs of ecological damage.<sup>109</sup> He observes that the Polluter Pays Principle, as originally envisioned in the OECD 1972 Recommendation, 'guaranteed only partial internalization of environmental costs; it was not intended to oblige polluters to assume the full consequences of their acts';<sup>110</sup> however, in more recent

<sup>&</sup>lt;sup>108</sup> de Sadeleer (n 3) 42.

<sup>&</sup>lt;sup>109</sup> ibid 43.

<sup>&</sup>lt;sup>110</sup> ibid 27.

Recommendations, the OECD's interpretation of the Polluter Pays Principle is 'moving in the direction of full internalization of pollution costs'.<sup>111</sup>

In discussions pertaining to the Standard and Extended versions of the Polluter Pays Principle, what often goes unacknowledged is that the model being used is what we may call a 'compliance model' – not a 'breach model'. As Kolstad *et al* note, 'Economists have generally viewed *ex ante* regulations (safety standards, Pigouvian fees) that regulate an activity before an accident occurs as substitutes for *ex post* policies (exposure to tort liability) for correcting externalities.'<sup>112</sup> However, such a model, which views standards and liability as substitutes, does not account for what happens when a legal standard is *breached*.<sup>113</sup>

The compliance model assumes that the desired (efficient) level of pollution (R) has been identified, and the polluter has – either to comply with command-and-controlstyle limits, or as a response to taxes or subsidies – abated to the desired level. The question then is whether the polluter adequately fulfilled its obligations by paying *TRR'* (the abatement cost of reducing pollution to R) or whether it should also pay *PRR'* (the cost of residual environmental damage).

However, to reiterate a point made in Section 6.4.3 above, courts cases generally involve an alleged *breach* of the prescribed standards or limits. Graphically, the analogous situation would be where regulatory standards capped pollution at *R*, but the mill produced, say, *S* units of sludge. The environmental cost in this case is not *PRR'* (the residual environmental cost of efficient pollution), but *PSS'*.

<sup>&</sup>lt;sup>111</sup> ibid, citing the OECD 1989 Recommendation as well as its 1991 Recommendation on Economic Instruments: OECD, Recommendation of the Council on the Use of Economic Instruments in Environmental Policy (31 January 1991) C(90)177.

<sup>&</sup>lt;sup>112</sup> Charles D Kolstad, Thomas S Ulen and Gary V Johnson, 'Ex Post Liability for Harm vs. Ex Ante Safety Regulation: Substitutes or Complements?' (1990) 80(4) American Economic Review 888, 888.

<sup>&</sup>lt;sup>113</sup> See e.g. Paul Burrows, 'Combining Regulation and Legal Liability for the Control of External Costs' (1999) 19(2) *International Review of Law and Economics* 227, 229: 'It is not uncommon to find regulated standards modeled as inequality constraints, but this implicitly assumes that there are no violations of the standard.'

Regardless of whether one subscribes to the Standard or Extended version of the Polluter Pays Principle, that is, whether or not one believes the polluter should pay *PRR'*, the additional damage represented by the quadrilateral *SRR'S'* is clearly caused by breach of a regulatory standard and, as such, is directly attributable to the polluter. Thus, when a polluter is found to be responsible for illegally discharging sludge, it should come as no surprise when the court orders it to pay the costs of removing and storing the sludge.<sup>114</sup> This finding supports Bugge's theory that there are not two but three versions of the Polluter Pays Principle: Standard, Extended, and 'as a principle of liability and compensation for environmental damage'.<sup>115</sup> Given that Indian courts apply the Polluter Pays Principle predominantly in situations of (alleged) breach rather than compliance, and given the now-familiar point about judicial valuation being essentially context-driven, it is not surprising that courts generally tend to invoke the third (liability-and-compensation) version of the principle. This finding is not just theoretically interesting (in the sense of showing how the Standard versus Extended PPP debate plays out in courts); it is also of practical relevance – the model graphically shows what the polluter has to pay in theory, but in practice, courts have to determine the liability in numerical terms, that is, they must put a quantified monetary value on the environmental damage. This brings us neatly to the third valuation choice - determining the valuation methodology.

### 6.5 Valuation under Polluter Pays: Methodology

Clearly it is not enough to simply hold polluters liable or to determine the heads of liability; the damages must also be quantified. When it comes to quantification, the Polluter Pays Principle case law reveals three broad categories of cases. First, the task of assessing and quantifying damages may be delegated to a government authority or expert body. Second, damages may be awarded based partly or solely on the size of the enterprise, annual turnover or cost of the offending project. Third, there is a handful of cases where, unfortunately, there is no obvious explanation as to how the court arrived at the final figure. All three approaches involve quantification (in the

<sup>&</sup>lt;sup>114</sup> See e.g. Enviro-Legal Action (n 46) [57].

<sup>&</sup>lt;sup>115</sup> Bugge (n 62) 413–14.

sense that courts must determine the liability in monetary terms), but only the first approach – delegation – can be said to involve valuation in the strict sense of the term.

### 6.5.1 Delegation approach

In *Enviro-Legal Action*, the NEERI Report, prepared pursuant to an earlier Supreme Court order, had estimated the damage to the affected villagers at Rs. 34.28 million and the cost of remediation of impacted well water and soil at Rs. 373.85 million.<sup>116</sup> However, the court held that estimating the cost of remedial measures is 'not a technical matter within the expertise of NEERI officials', and that, moreover, the estimate was made two years ago, so the situation, if anything, had probably deteriorated further due to the continued presence and discharge of sludge.<sup>117</sup> The court therefore ordered that the cost of remedial measures be determined by the Central Government.<sup>118</sup> The industries would then have six weeks to respond, and finally the Ministry of Environment and Forests would determine the amount to be paid, subject to the Supreme Court's orders if any.<sup>119</sup> This order was concerned with environmental restoration; with respect to claims for damage suffered by the villagers, the court clarified that it was 'open to them or any organisation on their behalf to institute suits in the appropriate civil court.'<sup>120</sup>

In *Vellore*, the court again tasked the Central Government with quantifying the damages, but gave comparatively more detailed directions on who would carry out this task and how.<sup>121</sup> The Central Government was to constitute an authority under the Environment Act.<sup>122</sup> The court specified that the authority was to be headed by a retired High Court judge, and that it 'may have other members – preferably with

<sup>&</sup>lt;sup>116</sup> Enviro-Legal Action (n 46) [38], citing NEERI Report (n 48) para 7.4.

<sup>&</sup>lt;sup>117</sup> Enviro-Legal Action (n 46) [68].

<sup>&</sup>lt;sup>118</sup> ibid [70]. The court had already held that in light of the provisions of the Environment (Protection) Act, 1986 ('Environment Act'), the Central Government was the appropriate authority for carrying out the task of undertaking the remedial measures, and the task of determining and recovering the amount required for this undertaking. ibid [67].

<sup>&</sup>lt;sup>119</sup> ibid.

<sup>&</sup>lt;sup>120</sup> ibid.

<sup>&</sup>lt;sup>121</sup> Vellore (n 8) [27].

<sup>122</sup> ibid.

expertise in the field of pollution control and environment protection - to be appointed by the Central Government'.<sup>123</sup>

The court also laid down the authority's terms of reference: it was 'compute the compensation under two heads namely, for reversing the ecology and for payment to individuals'.<sup>124</sup> In making its assessment, the authority was to consider expert opinion, allow the polluters an opportunity to respond, and 'implement ... the "polluter pays" principle'.<sup>125</sup> Finally, the court added that the compensation amount was to be deposited in an 'Environment Protection Fund' and utilised for compensating the affected persons and restoring the damaged environment.<sup>126</sup> Nearly identical directions – both with respect to the composition of the authority and its terms of reference (including compensation under two heads and applying the Polluter Pays Principle) – were also given in *Jagannath*.<sup>127</sup>

In *MC Mehta v Union of India* ('*Calcutta Tanneries* case')<sup>128</sup> – originating from a public interest petition against about 550 tanneries in Calcutta (now known as Kolkata) which were discharging untreated effluent into the river Ganga – the court made a similar order, but directed at the State Government rather than the Central Government.<sup>129</sup>

In *Kamal Nath I*, the court delegated to NEERI, a government research institute, the task of giving 'an assessment of the cost which is likely to be incurred for reversing the damage ... to the environment and ecology of the area'.<sup>130</sup> In the *Waste Oil* case, the importers were held liable under the Polluter Pays Principle to pay the costs of

<sup>126</sup> ibid.

<sup>&</sup>lt;sup>123</sup> ibid.

<sup>&</sup>lt;sup>124</sup> ibid.

<sup>&</sup>lt;sup>125</sup> ibid.

<sup>&</sup>lt;sup>127</sup> Jagannath (n 69) [46].

<sup>&</sup>lt;sup>128</sup> (1997) 2 SCC 411.

<sup>129</sup> ibid [22].

<sup>&</sup>lt;sup>130</sup> Kamal Nath I (n 90) [32].

incineration as determined by the expert committee which would supervise the incineration.<sup>131</sup>

Where the court adopts the delegation approach, the directions have tended to focus on delineating the heads of liability (scope choices) and on procedural rather than substantive aspects of quantification (when it comes to methodology choices). A typical passage (from *Vellore*) orders as follows:

The authority ... constituted by the Central Government shall implement the 'precautionary principle' and the 'polluter pays' principle. The authority shall, with the help of expert opinion and after giving opportunity to the concerned polluters assess the loss to the ecology/environment in the affected areas and shall also identify the individuals/families who have suffered because of the pollution and shall assess the compensation to be paid to the said individuals/families. The authority shall further determine the compensation to be recovered from the polluters as cost of reversing the damaged environment. The authority shall lay down just and fair procedure for completing the exercise.<sup>132</sup>

The remainder of the court's directions focus on procedural matters such as the constitution of the committee, recovery of damages and their payment into the 'Environment Protection Fund'.<sup>133</sup>

The above passage from the *Vellore* judgment is broadly representative of the delegation approach.<sup>134</sup> In the analysis below, for simplicity, I mostly use *Vellore* to illustrate my arguments; with minor modifications, the same could be said of other cases where the courts used the delegation approach.

The substantive directions leave some room for ambiguity. First, looking at the factual context of the decision, *Vellore* involved tanneries and other industries

<sup>&</sup>lt;sup>131</sup> Waste Oil case (n 70) [37].

<sup>&</sup>lt;sup>132</sup> Vellore (n 8) [27].

<sup>133</sup> ibid.

 <sup>&</sup>lt;sup>134</sup> For other examples see *Enviro-Legal Action* (n 46) 70; *Jagannath* (n 69) [46]; *Calcutta Tanneries* case (n 128) [14]–[15].

discharging untreated effluent which breached statutory and regulatory emission and discharge standards.<sup>135</sup> As such, the scenario, in its essentials, is like the breach model that was discussed in Section 6.4.3 above and graphically illustrated in Fig. 6-3. There were specific emission and discharge standards in place (set at a level *R*) and industries producing effluent (an amount *S*) in excess of that level. What the court's terms of reference did not clarify is whether the industries were liable to pay the equivalent of *PSS'*, or only *SRR'S'*. In other words, should they be held liable for *all* of the environmental damage caused by their discharges, or only for that portion of the damage which was caused by effluent discharge in excess of the standards?

*Second*, the court's focus is squarely on restoration: 'reversing the damage caused to the ecology and environment by pollution'.<sup>136</sup> However, this leaves two types of damage unaccounted for. First, if the pollution causes irreversible harm, for example the extinction of a species, 'reversing the damage' is by definition impossible.<sup>137</sup> Second, it does not provide for the value that is lost in the period after the damage but before restoration is complete, for example loss of fishing opportunities (both commercial and recreational) in a polluted river.<sup>138</sup> Accounting for irreversible and interim damages would require the court, and ultimately the expert authority, to look beyond restoration costs and put a value on certain forms of environmental damage.

*Third*, in addition to environmental restoration costs, the court orders generally require compensation for individual sufferers. However, as may be seen from the passage from *Vellore* quoted above, the orders do not clearly specify the grounds of compensation. Some grounds may be inferred from the judgments: for instance, the *Calcutta Tanneries* judgment referred to untreated wastewater causing health problems,<sup>139</sup> and in *Vellore* it was alleged that effluent discharge had made well-water

<sup>&</sup>lt;sup>135</sup> Vellore (n 8) [25].

<sup>136</sup> ibid [27].

<sup>&</sup>lt;sup>137</sup> On various forms of 'irreversible' environmental damage, see Cass R Sunstein, 'Irreversibility' (2010) 9(3–4) *Law, Probability and Risk* 227.

<sup>&</sup>lt;sup>138</sup> It could be argued that such interim loss is covered by provision for compensation for individual sufferers, but as I argue below, the heads of such compensation remain somewhat unclear.

<sup>&</sup>lt;sup>139</sup> Calcutta Tanneries case (n 128) [1].

unfit for drinking or even irrigation.<sup>140</sup> In the terminology of the Millennium Ecosystem Assessment, these injuries would be classed as a loss of *provisioning services*.<sup>141</sup> However, the report also identifies other benefits which people obtain from ecosystems, namely *cultural services* (such as spiritual and aesthetic values, cultural heritage, recreation and tourism) and *regulating services* (such as regulation of air and water quality, climate, erosion and natural hazards).<sup>142</sup> Economists have devised methods to estimate the economic value of such services,<sup>143</sup> and as such, it is possible to quantify the harm caused by impairment of these services due to pollution.

The actual quantification of these losses, involving the application of econometric methods, is a technical matter which the court-constituted expert authority is, in theory, better equipped to undertake. However, before quantifying the values, a crucial preliminary step is to determine what values are relevant for the valuation process.<sup>144</sup> The grounds (i.e. the categories of losses for which injured parties may claim compensation) is a question of statutory interpretation, or application of common-law principles of tort. As such, it is a question which is within the remit of courts. Therefore, if the court, in its terms of reference, clearly specified the heads of compensation which the expert authority should assess and quantify, it would promote consistency and conformity to statutory and common-law principles. On the

<sup>&</sup>lt;sup>140</sup> Vellore (n 8) [1].

<sup>&</sup>lt;sup>141</sup> Millennium Ecosystem Assessment, *Ecosystems and Human Well-Being: Synthesis* (Island Press 2005) 7.

<sup>&</sup>lt;sup>142</sup> ibid. The report also identifies a category of *supporting services* such as photosynthesis and nutrient cycling; however, it recognises that 'their impacts on people are often indirect or occur over a very long time'. ibid 40.

<sup>&</sup>lt;sup>143</sup> See e.g. A Myrick Freeman III, Joseph A Herriges and Catherine L Kling, *The Measurement of Environmental and Resource Values: Theory and Methods* (3rd edn, RFF Press 2014); Jonathan M Harris and Brian Roach, *Environmental and Natural Resource Economics: A Contemporary Approach* (3rd edn, ME Sharpe 2013); Timothy C Haab and Kenneth E McConnell, *Valuing Environmental and Natural Resources: The Econometrics of Non-Market Valuation* (Edward Elgar 2002).

<sup>&</sup>lt;sup>144</sup> Denis Swords, 'Ohio v. United States Department of the Interior: A Contingent Step Forward for Environmentalists' (1991) 51 *Louisiana Law Review* 1347, 1350: 'Natural resource valuation is a two step process. First the person responsible for valuation must determine the values attributable to natural resources that the valuation process is to include ... Second, the valuation process must develop a method for monetizing the accounted for values...'

other hand, omitting certain categories of services would go against the Supreme Court's own holding that the Polluter Pays Principle should include 'full environmental cost' and not just costs which are 'immediately tangible'.<sup>145</sup>

### 6.5.2 *Percentage approach*

There is another line of cases where, rather than delegating the task of assessing and quantifying damages to a government authority or expert body, the court awarded damages based partly or solely on the size of the enterprise, annual turnover or cost of the offending project.

This trend in fact dates back to the *Oleum* case, where the court held that:

the measure of compensation [in absolute liability cases] must be corelated to the magnitude and capacity of the enterprise because such compensation must have a deterrent effect. The larger and more prosperous the enterprise, the greater must be the amount of compensation payable by it for the harm caused on account of an accident in the carrying on of the hazardous or inherently dangerous activity by the enterprise.<sup>146</sup>

In *Deepak Nitrite v State of Gujarat ('Deepak Nitrite')*, the Supreme Court heard an appeal against a Gujarat High Court order directing chemical industries to pay 1 percent of annual turnover towards compensation and environmental improvement.<sup>147</sup> The Supreme Court held that in some cases, percentage of turnover 'may be a proper measure because the method to be adopted in awarding damages on the basis of "polluter to pay" principle has got to be practical, simple and easy in application'.<sup>148</sup> In the event, although the industries had failed to meet prescribed

<sup>&</sup>lt;sup>145</sup> Waste Oil case (n 70) [27].

<sup>&</sup>lt;sup>146</sup> Oleum case (n 42) [32]. On the concept of absolute liability, see n 45 and accompanying text.

<sup>&</sup>lt;sup>147</sup> (2004) 6 SCC 402 [2]. The High Court had relied on a previous decision (*Pravinbhai Jashbhai Patel v State of Gujarat* (1995) 2 GLR 1210 [135]) where industrial units causing water pollution were ordered to pay of 1 percent of gross annual turnover, to be used for improving conditions in the affected villages. That decision, however, did not explicitly invoke the Polluter Pays Principle in arriving at the 1 percent figure.

<sup>&</sup>lt;sup>148</sup> *Deepak Nitrite* (n 147) [6].
effluent treatment standards, there was no finding as to whether the breach had caused *actual* damage to environment.<sup>149</sup> The court held that compensation 'must have some broad co-relation not only with the magnitude and capacity of the enterprise but also with the harm caused by it',<sup>150</sup> and accordingly directed the High Court to investigate whether there was any actual damage.<sup>151</sup> The High Court was left to decide, in light of such investigation, whether 1 percent of annual turnover 'would be an appropriate formula' in this case.<sup>152</sup>

More recently, in *Forward Foundation*, where the project proponents were held liable to pay compensation for restoration and restitution of the environment,<sup>153</sup> the NGT noted that it 'may not be possible to determine the ... compensation with exactitude but that does not mean that the project proponents can avoid liability'.<sup>154</sup> Invoking the Polluter Pays Principle,<sup>155</sup> the NGT directed the project proponents to pay compensation, in the first instance, 'at the rate of 5 percent of the cost of the project'.<sup>156</sup> It also directed that a committee be constituted, which would determine '[t]he final amounts for restoration of environment and ecology'.<sup>157</sup>

The second approach, as noted in Section 6.4.1 above, has its genesis in the *Oleum* case where the court held that 'the measure of compensation [in absolute liability cases] must be co-related to the magnitude and capacity of the enterprise'.<sup>158</sup> However

<sup>&</sup>lt;sup>149</sup> ibid. Subsequently, in the *Waste Oil* case, the court clarified that the ratio in *Deepak Nitrite* was 'confined to the facts of that case'. In particular, *Deepak Nitrite* does not stand for the proposition that the Polluter Pays Principle can *only* be invoked when there is actual degradation of the environment; the principle can also be invoked when 'offending activities [have] the *potential* of degrading the environment'. *Waste Oil* case (n 70) [28] (emphasis added).

<sup>&</sup>lt;sup>150</sup> *Deepak Nitrite* (n 147) [6].

<sup>&</sup>lt;sup>151</sup> ibid [7].

<sup>&</sup>lt;sup>152</sup> ibid.

<sup>&</sup>lt;sup>153</sup> Forward Foundation (n 77) [81].

<sup>&</sup>lt;sup>154</sup> ibid [82].

<sup>&</sup>lt;sup>155</sup> ibid [81], [85].

<sup>&</sup>lt;sup>156</sup> ibid [84]. The project cost of the two project proponents were Rs. 23.47 billion and Rs. 4.5 billion (ibid [82]). They were therefore held liable to pay Rs. 1.17 billion and Rs. 225 million respectively (ibid [84]).

<sup>&</sup>lt;sup>157</sup> ibid [84].

<sup>&</sup>lt;sup>158</sup> Oleum case (n 42) [32].

the decision left a number of questions unanswered. It did not define 'magnitude and capacity of the enterprise'. The Micro, Small and Medium Enterprises Development Act, 2006 classifies enterprises based on investment in plant and machinery (for enterprises engaged in goods manufacture or production) or investment in equipment (for service enterprises),<sup>159</sup> but this act was promulgated after the *Oleum* case, and its stated purpose is facilitating the promotion, development and enhancing the competitiveness of enterprises.<sup>160</sup> As such, it is not clear whether it can legitimately be used to fill gaps in the *Oleum* judgment. In any case, the court went on to hold that '[t]he larger *and more prosperous* the enterprise, the greater must be the amount of compensation payable by it',<sup>161</sup> and investment alone is obviously not an indication of how 'prosperous' an enterprise is.<sup>162</sup> The court also did not specify precisely *how* compensation should be co-related to the magnitude and capacity of the enterprise (for example, whether it should be a percentage thereof, and if so, what percentage).

In *Deepak Nitrite*, as noted earlier in this Section, the Gujarat High Court directed industries to pay 1 percent of annual turnover.<sup>163</sup> On appeal, the Supreme Court's decision was rather ambivalent: it held that compensation 'must have some broad co-relation not only with the magnitude and capacity of the enterprise but also with the harm caused by it',<sup>164</sup> but on the one hand, it did not rule out the possibility that the 1 percent formula may be appropriate.<sup>165</sup>

If indeed compensation is calculated as a pure percentage of annual turnover, it is hard to see how it is also corelated with the harm caused by the enterprise. In that case, the only conceivable correlation between compensation and the harm caused is a simple binary: the enterprise pays 1 percent of annual turnover if harm was caused,

<sup>&</sup>lt;sup>159</sup> Micro, Small and Medium Enterprises Development Act, 2006, s 7.

<sup>&</sup>lt;sup>160</sup> ibid, Preamble.

<sup>&</sup>lt;sup>161</sup> Oleum case (n 42) [32] (emphasis added).

<sup>&</sup>lt;sup>162</sup> Section 2(85) of the Companies Act, 2013 categorises certain companies as 'small companies' based on paid-up share capital and annual turnover.

<sup>&</sup>lt;sup>163</sup> Deepak Nitrite (n 147) [2].

<sup>&</sup>lt;sup>164</sup> ibid [6].

<sup>&</sup>lt;sup>165</sup> ibid [6].

and nothing if harm was not caused. However, this raises serious concerns around arbitrariness and consistency. To state the obvious, a company with a high turnover would be liable for large sum of money even for relatively minor damage, and vice versa.

Indian courts have also emphasised the deterrent value of compensation awards,<sup>166</sup> and in this respect, economists have long recognised the risks of imposing damages 'as a purely punitive measure without any necessary correlation to the damages actually caused or to the costs of treatment'.<sup>167</sup> Reed warned that while 'this method would presumably act as a deterrent to further discharge, ... it would tend to induce manufacturers to undertake abatement measures more expensive than the social costs of the pollution which are thereby avoided.'<sup>168</sup>

A more reasonable approach was that adopted by the NGT in *Forward Foundation*, where it ordered the project proponents to pay compensation at 5 percent of the cost of the project in the first instance, with additional restoration costs to be subsequently determined by a committee.<sup>169</sup> The damages award thus has two components, one based on cost of the project and the other based on restoration costs. However, the choice of project cost as a criterion has attracted criticism. First, as Bhushan *et al* have pointed out,<sup>170</sup> the NGT cited a Supreme Court decision on illegal mining activities where the Supreme Court directed that '10% of the sale proceeds' of illegally mined iron ore must be paid into a fund 'for the purpose of sustainable development and

<sup>&</sup>lt;sup>166</sup> See Section 6.4.1 above.

<sup>&</sup>lt;sup>167</sup> Kenneth R Reed, 'Economic Incentives for Pollution Abatement: Applying Theory to Practice' (1970) 12 Arizona Law Review 511, 522. In this passage Reed is discussing ex ante emission charges, but the same logic applies to ex post damages, in that the prospect of liability, in theory, incentivises potential polluters to undertake abatement measures. See also n 181 below.

<sup>&</sup>lt;sup>168</sup> ibid. On the other hand, if the amount were too low, manufacturers would *under*-abate.

<sup>&</sup>lt;sup>169</sup> Forward Foundation (n 77) [84].

<sup>&</sup>lt;sup>170</sup> Chandra Bhushan, Srestha Banerjee and Ikshaku Bezbaroa, Green Tribunal, Green Approach: The Need for Better Implementation of the Polluter Pays Principle (Centre for Science and Environment 2018) 9–10.

inter-generational equity'.<sup>171</sup> However, the NGT instead used project cost as a basis for calculating compensation.

Second, the rationale for the 5 percent figure was not altogether convincing. The relevant passage in the judgment is as follows:

We are of the considered view that 10 per cent of the project cost may be somewhat on the higher side and to maintain the equitable balance between the default and the consequential liability of the applicant, we direct the Project Proponents to pay at the first instance compensation for their default at the rate of 5 per cent of the cost of the project.<sup>172</sup>

#### 6.5.3 Quantification unexplained

Lastly, in a small number of cases, there is no obvious attempt at quantification; the court has awarded damages or imposed a fine without a clear explanation of how it arrived at that figure. In *Kamal Nath I*, as mentioned above, the motel company had already been ordered to pay for environmental restitution,<sup>173</sup> and the task of quantifying the requisite cost was delegated to NEERI.<sup>174</sup> Subsequently, in *Kamal Nath III*, the motel company was also held liable for exemplary damages.<sup>175</sup> The quantum of exemplary damages was fixed at Rs. 1 million, to be utilised for flood protection works in the area of the river Beas affected by the motel company's actions.<sup>176</sup> However, other than invoking deterrent logic and clarifying that this amount was separate from and additional to any liability for ecological restoration,<sup>177</sup> the court did not provide any indication as to how it arrived at this figure.

 <sup>&</sup>lt;sup>171</sup> Goa Foundation v Union of India (2014) 6 SCC 590 [63], cited in Forward Foundation (n 77) [83].

<sup>&</sup>lt;sup>172</sup> Forward Foundation (n 77) [84].

<sup>&</sup>lt;sup>173</sup> Kamal Nath I (n 90) [32].

<sup>&</sup>lt;sup>174</sup> ibid (see n 130 and accompanying text).

<sup>&</sup>lt;sup>175</sup> Kamal Nath III (n 89) [8] (see n 91 and accompanying text).

<sup>&</sup>lt;sup>176</sup> ibid [9].

<sup>&</sup>lt;sup>177</sup> ibid.

Cases where there is no clear explanation of how compensation was calculated are obviously problematic from the standpoint of legal consistency and transparency. Jariwala is rightly critical of *Kamal Nath III*, in which, he argues, 'the quantum of exemplary damages ... does not give any accounting or any detailed application of mind ... and, therefore, it raises a doubt about the reasonableness of such amount'.<sup>178</sup>

Additionally, the omission undermines the court's own deterrence logic.<sup>179</sup> The economic theory of exemplary damages is premised on the idea that such damages would incentivise other potential polluters to take precautions to reduce or eliminate the risk of pollution.<sup>180</sup> However, where the quantum of damages is uncertain and the quantification methodology is unclear, potential polluters may take insufficient precautions or excessive precautions – both of which are economically inefficient.<sup>181</sup>

### 6.6 Conclusion

Most if not all of the economic scholarship on the Polluter Pays Principle makes at least a passing reference to the principle's legal embodiments. In this chapter, I tried to show that by engaging more closely with how courts *actually use* the principle in their decision-making, some of the apparent theoretical ambiguities – whether the Polluter Pays Principle includes *ex ante* or *ex post* costs, whether it requires full or only partial internalisation of costs – can be resolved. Or perhaps, it is more accurate to say that the ambiguities fall away, in the sense that the answers are revealed to be

<sup>&</sup>lt;sup>178</sup> CM Jariwala, *Environmental Justice* (APH Publishing 2004) 153.

<sup>&</sup>lt;sup>179</sup> Kamal Nath III (n 89) [8]: 'In addition to damages aforesaid [for environmental restoration], the person guilty of causing pollution can also be held liable to pay exemplary damages so that it may act as a deterrent for others not to cause pollution in any manner.'

<sup>&</sup>lt;sup>180</sup> See generally A Mitchell Polinsky and Steven Shavell, 'Punitive Damages: An Economic Analysis' (1997) 111(4) *Harvard Law Review* 869; Anthony J Sebok, 'Normative Theories of Punitive Damages: The Case of Deterrence' in John Oberdiek (ed), *Philosophical Foundations of the Law of Torts* (Oxford University Press 2014) 17.

<sup>&</sup>lt;sup>181</sup> Polinsky and Shavell (n 180) 882: 'if damages are less than harm, parties will engage in activities to an excessive extent – that is, they will engage in activities even when the benefits are outweighed by the harms caused. Conversely, if damages exceed harm, parties may be led to curtail their activities to an inappropriate extent – to refrain from engaging in them even when the benefits exceed the harms caused.'

largely a matter of context. In particular, economists largely work with compliance models, while courts, though they rarely if ever employ mathematical models, typically deal with scenarios which are better represented as breach models.

Similarly, most if not all of the legal scholarship on the Polluter Pays Principle makes at least a passing reference to the principle's economic roots. This chapter is an attempt to engage more closely with the principle's economic logic, and in that light, evaluate the interpretation and application of the Polluter Pays Principle by Indian courts, particularly with respect to the valuation of environmental damage.

What emerges from the foregoing review of case law is that over the past three decades, the Polluter Pays Principle has been increasingly integrated into Indian environmental law, eventually being declared 'part of the law of the land' and earning statutory recognition in the NGT Act. Judicial justifications of the Polluter Pays Principle have invoked notions of corrective justice, responsibility, deterrence and social contract theory. Payments under the Polluter Pays Principle have included environmental compensation (including restoration costs, costs of avoiding pollution, and compensation for likely future damage), compensation to human victims of pollution, and exemplary damages. Finally, the quantification of damages has, from time to time, been delegated to government authorities and expert bodies, but it has also been calculated based on the size of the enterprise, annual turnover or cost of the project, or occasionally, not been explained at all.

The case law shows the relevance of context in courts' decisions on the scope and methodology of valuation, and sheds some light on some subsidiary questions as to which costs are included in the Polluter Pays Principle. However, there are certain ambiguities and weaknesses in the court's approach to quantification.

Just as the Polluter Pays Principle, taken on its own, offers no guidance as to which specific costs are included within its ambit – *ex ante, ex post* or both; abatement costs only or also damage costs, and so on – it also says nothing about how those costs are to be calculated. However, '[c]onsistent application of the Principle ... requires proper pricing of goods – that is, the price must reflect all environmental and social

costs'.<sup>182</sup> Pricing is particularly fraught when it involves non-market valuation, that is, techniques for valuing goods and services that are not traded on the market (a feature shared by many environmental resources and amenities).<sup>183</sup> Bugge cautions that the Extended Polluter Pays Principle in particular 'raises numerous technical difficulties',<sup>184</sup> foremost among which is estimating the price of environmental values and resources.<sup>185</sup> Similarly, de Sadeleer asserts that full compensation for ecological damage (as required by the Extended Polluter Pays Principle) 'raises the question of calculating its value'.<sup>186</sup>

In Section 6.5, I suggested that courts should look beyond restoration costs and consider other forms of environmental damage (and how they may be quantified); that even when delegating quantification, they should clearly specify the scope of compensation and restoration costs; that the percentage approach should be used with caution and only as one component of damages, if at all (so that damage awards do not lose all correlation to the actual environmental damage caused); that the quantification rationale should be clearly explained. In these recommendations, there are two underlying themes. The first is the now-familiar idea that a crucial step of valuation is determining what values are relevant for the valuation process. The second is that greater transparency would make valuation more economically, legally and ethically sound. These principles should go some way towards realising the Supreme Court's edict that the Polluter Pays Principle should be 'should be simple, practical and suited to the conditions obtaining in this country.'<sup>187</sup> De Sadeleer is right to say that 'the principle's vagueness ... should not lead us to condemn it. Rather, it

<sup>&</sup>lt;sup>182</sup> Kettlewell (n 34) 463. See also Schwartz (n 64) 255: 'to achieve the objectives of the polluter-pays principle necessitates the institution of methods that could value the environment correctly in an economic setting'.

<sup>&</sup>lt;sup>183</sup> For an overview of non-market valuation methods, see Freeman et al (n 143) 24–26. For criticism, see e.g. Robert K Niewijk, Note, 'Ask a Silly Question: Contingent Valuation of Natural Resource Damages' (1992) 105 Harvard Law Review 1981; Mark Sagoff, The Economy of the Earth: Philosophy, Law, and the Environment (2nd edn, Cambridge University Press 2008) ch 4.

<sup>&</sup>lt;sup>184</sup> Bugge (n 62) 416.

<sup>&</sup>lt;sup>185</sup> ibid.

<sup>&</sup>lt;sup>186</sup> de Sadeleer (n 3) 43.

<sup>&</sup>lt;sup>187</sup> Enviro-Legal Action (n 46) [65].

is up to legal doctrine progressively to add the finishing touches that will clarify the definition and scope of the principle'.<sup>188</sup> To that, I would add that legal scholarship, drawing on legal doctrine and economic theory, can and should endeavour to do the same.

<sup>&</sup>lt;sup>188</sup> de Sadeleer (n 3) 60.

# Chapter 7

# **Prospective and Retrospective Valuation**

# 7.1 Environmental valuation in context

Environmental valuation literature tends not to pay much attention to the *context* of valuation. This is true of both economics literature and legal literature on environmental valuation, but for different reasons.

A dictionary of environmental economics defines valuation as 'the estimation of the monetary value of an environmental asset'.<sup>1</sup> The framing of the definition suggests the premise that environmental assets have a specific – though perhaps unknown – monetary value, and the economist's task is to estimate it as closely as possible. This premise may seem questionable: after all, the value of an environmental asset is not an objective fact, at least not in the same sense as, say, the market value of one kilogram of gold. But to most economists, the premise seems far more acceptable – largely because the word 'value' in economics has a specific meaning. As Freeman *et al* explain:

The term 'value' can have several different meanings. ... One common use of the term is to mean 'that which is desirable or worthy of esteem for its own sake; thing or quality having intrinsic worth' (*Webster's New World Dictionary*). In contrast, economists use the term in a sense more akin to a different definition, 'a fair or proper equivalent in money, commodities, etc.' (*Webster's* again), where 'equivalent in money' represents the sum of money that would have an equivalent effect on the welfare or utilities of individuals.<sup>2</sup>

<sup>&</sup>lt;sup>1</sup> Anil Markandya and others (eds), *Dictionary of Environmental Economics* (Earthscan 2001) 183.

<sup>&</sup>lt;sup>2</sup> A Myrick Freeman III, Joseph A Herriges and Catherine L Kling, *The Measurement of Environmental and Resource Values: Theory and Methods* (3rd edn, RFF Press 2014) 6.

Of course, there are theoretical and methodological difficulties inherent in measuring this 'equivalent in money',<sup>3</sup> but the 'environmental valuation problem', as framed by economists, ultimately comes down to measuring, typically using monetary units, 'the welfare gains and losses associated with changes in levels of environmental goods'.<sup>4</sup>

Thus the economist's framing of the environmental valuation problem is not dissimilar to the problem of, say, estimating the population of a territory: there may be semantic disagreements – for instance about how to define 'territory' or 'resident' (i.e. who should count in the census) – and there may be disagreements about the appropriate methodology, but given an agreed-upon set of definitions, the population (or in the case of environmental valuation, the welfare gain or loss) is an objective figure, and the statistician's (or the economist's) task is to form an accurate estimate of that figure.<sup>5</sup>

In this conception of valuation, the role of context is limited, if not non-existent. For a given change in levels of an environmental good (such as a percentage gain in air quality, or a percentage loss of species), the goal is to estimate the consequent welfare gain or loss. Definitions – for example, the population whose welfare is under consideration – are treated as settled, and the *purpose* of the valuation exercise is effectively immaterial. This is occasionally – but only occasionally – acknowledged in the literature: for instance, Desvousges *et al* criticise economists, themselves

<sup>&</sup>lt;sup>3</sup> See generally Chapter 2.

<sup>&</sup>lt;sup>4</sup> Nancy E Bockstael and A Myrick Freeman III, 'Welfare Theory and Valuation' in Karl-Gran Mler and Jeffrey R Vincent, *Handbook of Environmental Economics* vol 2 (Elsevier 2005) 522.

<sup>&</sup>lt;sup>5</sup> The analogy is not perfect. Given sufficient resources, a population can be measured to a high degree of accuracy by a full census, but when it comes to environmental valuation, most economists agree that notwithstanding continued improvements in valuation methods, '[t]he state of the art cannot be expected to advance to the point of producing exact values for all kinds of environmental change'. Freeman and others (n 2) 14. However, Freeman *et al's* framing suggests the premise that 'exact values' do exist, even if economic methods are not, and perhaps never will be, advanced enough to accurately measure them.

included, for paying 'too little attention to the ultimate uses of their estimates in different public-policy settings'.<sup>6</sup>

If we define environmental value, as many economists do, in terms of aggregate willingness-to-pay ('WTP'), context indeed has a limited role. However, as Schmidtz warns, 'there is a problem with jumping from economic to philosophical discussions without stopping to remind ourselves that what is taken for granted in one kind of discussion cannot be taken for granted in the other'.<sup>7</sup> Schmidtz was writing about the role of assumptions in economics and philosophy, but the warning, of course, applies also to economics and law, and the danger of terms being lost in interdisciplinary translation. As the last four chapters show, environmental valuation in court raises a plethora of questions including which values (and whose welfare) should count and the answer rarely (perhaps never) is 'all of them'. Valuation in legal cases is therefore selective, rarely following the strict economic definition of summing over all WTPs; rather, it is better defined in the more general sense of putting a monetary value on environmental goods or services. It is also highly context-dependent because ultimately, courts engage with environmental valuation in pursuance of their primary function, which is to make a decision - 'to choose between claims of competing interests'.<sup>8</sup> Valuation in court cases is not an end in itself; it is an input into a decision - decisions such as how much compensation, if any, to award for environmental loss, and if so, how that compensation should be calculated, how to

<sup>&</sup>lt;sup>6</sup> William H Desvousges and others, 'Measuring Natural Resource Damages with Contingent Valuation: Tests of Validity and Reliability' in Jerry A Hausman (ed), *Contingent Valuation: A Critical Assessment* (North Holland 1993) 92. This acknowledgement is in a particular context, namely the reliability of the contingent valuation method (some authors take the position that the method is reliable enough for certain types of uses but not for others, see e.g. V Kerry Smith, 'To Keep or Toss the Contingent Valuation Method' in Ronald G Cummings, David S Brookshire and William D Schulze (eds), *Valuing Environmental Goods: An Assessment of the Contingent Valuation Method* (Rowman and Allanheld 1986) 175). In the particular case of natural resource damage assessment, Desvousges *et al* conclude: 'Given the current state of the art, we do not think that CV provides either valid or reliable estimates of nonuse damages.' ibid 114.

<sup>&</sup>lt;sup>7</sup> David Schmidtz, 'A Place for Cost-Benefit Analysis' (2001) 11 *Philosophical Issues* 148, 156.

<sup>&</sup>lt;sup>8</sup> Elliot L Richardson, 'Freedom of Expression and the Function of Courts' (1951) 65(1) *Harvard Law Review* 1, 1.

weigh the costs and benefits of a proposed action, or whether the weighing should be done at all.

While economists employ an acontextual definition of valuation, legal literature on environmental valuation, on the contrary, tends to be decidedly context-specific. Paradoxically, this too results in a lack of attention to context. Consider the two main categories of cases where questions of valuation figure prominently: cost-benefit analysis (involving prospective valuation, see Chapter 3) and environmental damage (involving retrospective valuation, see Chapters 4 and 6). Traditionally, these have been treated as subjects of two different spheres of legal scholarship: the former, broadly speaking, has been the province of scholars of administrative law,<sup>9</sup> and the latter of tort law experts.<sup>10</sup> The context of valuation for cost-benefit analysis and the

See e.g. David M Driesen, 'The Societal Cost of Environmental Regulation: Beyond Administrative Cost-Benefit Analysis' (1997) 24(3) *Ecology Law Quarterly* 545; Michael Abramowicz, 'Toward a Jurisprudence of Cost-Benefit Analysis' (2002) 100 *Michigan Law Review* 1708; Frank Ackerman and Lisa Heinzerling, 'Pricing the Priceless: Cost-Benefit Analysis of Environmental Protection' (2002) 150 *University of Pennsylvania Law Review* 1553; Jonathan Cannon, 'Sounds of Silence: Cost-Benefit Canons in *Entergy Corp. v. Riverkeeper, Inc.*' (2010) 2 *Harvard Environmental Law Review* 425; Cass R Sunstein, 'Cost-Benefit Analysis and Arbitrariness Review' (2017) 41 *Harvard Environmental Law Review* 1; Francis Dennig, 'Climate Change and the Re-Evaluation of Cost-Benefit Analysis' (2018) 151(1) *Climatic Change* 43; Jonathan S Masur and Eric A Posner, 'Cost-Benefit Analysis and the Judicial Role' (2018) 85(4) *University of Chicago Law Review* 935.

<sup>&</sup>lt;sup>10</sup> See e.g. Frank B Cross, 'Natural Resource Damage Valuation' (1989) 42 Vanderbilt Law Review 269; Kevin M Ward and John W Duffield, Natural Resource Damages: Law and Economics (Wiley 1992); Brian R Binger, Robert F Copple and Elizabeth Hoffman, 'Use of Contingent Valuation Methodology in Natural Resource Damage Assessments: Legal Fact and Economic Fiction' (1994) 89 Northwestern University Law Review 1029; Philippe Sands and Richard B Stewart, 'Valuation of Environmental Damage - US and International Law Approaches' (1996) 5 Review of European Community & International Environmental Law 290; Peter Wetterstein (ed), Harm to the Environment: The Right to Compensation and the Assessment of Damages (Clarendon Press 1997); Dale B Thompson, 'Valuing the Environment: Courts' Struggles with Natural Resource Damages' (2002) 32 Environmental Law 57; Michael Bowman and Alan Boyle (eds), Environmental Damage in International and Comparative Law: Problems of Definition and Valuation (Oxford University Press 2002); Raymond J Kopp and V Kerry Smith (ed), Valuing Natural Assets: The Economics of Natural Resource Damage Assessment (Routledge 2013); Carol Adaire Jones and Lisa DiPinto, 'The Role of Ecosystem Services in USA Natural Resource Liability Litigation' (2018) 29 Ecosystem Services 333.

context of valuation for environmental damage are very different, but when either of these is studied in isolation, the context is a given, and therefore taken for granted.

However, when we take environmental valuation, rather than a specific field of law, as the starting point of investigation as I do in my thesis, it becomes evident that there is a variety of cases where questions of valuation come up before courts. In the foregoing chapters, I grouped them into two categories: cases involving prospective valuation (Chapters 3 and 5), and those involving retrospective valuation (Chapters 4 and 6). In Section 7.2, I highlight some ways in which prospective and retrospective valuation differ – both in terms of theoretical considerations and the applicable statutory framework. Then, in Section 7.3 to 7.5, I argue that despite these differences, the cases in these categories share an important common feature: they involve judges making valuation choices (whether or not to use valuation, what values to include and how to measure them), and those choices are driven by, and justified with reference to, the statutory and environmental context. The concept of valuation choices, therefore, gives us a valuable theoretical framework for studying and evaluating judicial decisions on valuation in a range of contexts.

#### 7.2 **Prospective and retrospective valuation**

#### 7.2.1 Past damage and future effects

There are important theoretical differences between prospective and retrospective valuation. The first and most obvious is that the former involves future environmental changes, while the latter typically involves changes – often environmental damage – which have already occurred. Consider the valuation of environmental damage caused by an oil spill at sea – a classic example of actual damage where valuation occurs after the fact.<sup>11</sup> If we now contrast this with valuation

<sup>&</sup>lt;sup>11</sup> One example of a court case involving such a spill is *People of the State of California ex rel. Department of Fish and Game v BP America, Inc.* Orange County Superior Court Case Number 64 63 39 (1997). A good account of the trial, written by the testifying experts for the plaintiffs, appears in David J Chapman and W Michael Hanemann, 'Environmental Damages in Court: The American Trader Case' in Anthony Heyes (ed), *The Law and Economics of the Environment* (Edward Elgar Publishing 2001). For the defendants'

as an input into, say, an *ex ante* cost-benefit analysis of marine safety measures designed to minimise the risk of future spills,<sup>12</sup> some important differences become clear.

In the first case, the oil spill has definitely occurred, and many of its effects are presumably known, observable and measurable. The second case involves probabilities. The occurrence of the oil spill is not a matter of fact, but rather of risk or uncertainty.<sup>13</sup> The nature and magnitude of the adverse effects ensuing from such a spill are also unknown. At best they can be estimated,<sup>14</sup> but until they occur, they cannot be empirically observed.<sup>15</sup>

#### 7.2.2 Actual versus hypothetical transfers

A second difference is that damages, if awarded, result in *actual* wealth transfers – the party which is found to be liable has to compensate the party which suffered the

perspective, see Richard W Dunford, 'The *American Trader* Oil Spill: An Alternative View of Recreation Use Damages' (1999) 19(1) *Association of Environmental and Resource Economists Newsletter* 12.

<sup>&</sup>lt;sup>12</sup> See e.g. Elizabeth Spiro and Andrew Parfitt, 'Applying Cost–Benefit Analysis to Marine Safety Measures' (1995) 22(3) *Maritime Policy and Management* 215, describing the UK Department of Transport's cost-benefit analysis of deploying tugs to protect the coast from oil and chemical pollution.

<sup>&</sup>lt;sup>13</sup> Economists make a distinction between ""risk" where the probabilities are known, and "uncertainty" where they are not'. Seamus Bradley, 'Scientific Uncertainty: A User's Guide' (2012) Grantham Institute on Climate Change and the Environment Working Paper No 56, tracing the distinction to Frank Knight, *Risk, Uncertainty and Profit* (Houghton and Mifflin 1921). On the problem of uncertainty in environmental law, see Daniel A Farber, 'Probabilities Behaving Badly: Complexity Theory and Environmental Uncertainty' (2003) 37 UC Davis Law Review 145.

<sup>&</sup>lt;sup>14</sup> For an evaluation of oil spill modeling research as a knowledge domain, see Jake R Nelson and Tony H Grubesic, 'Oil Spill Modeling: Mapping the Knowledge Domain' (2020) 44(1) *Progress in Physical Geography: Earth and Environment* 120.

<sup>&</sup>lt;sup>15</sup> '[A] common scenario in ecosystem valuation is one in which there is really no good probabilistic information about the likely magnitudes of some variables and what is available is based only on expert judgment.' National Research Council, *Valuing Ecosystem Services: Toward Better Environmental Decision-Making* (The National Academies Press 2005) 216–17.

injury. Cost-benefit analysis, on the other hand, is based on hypothetical transfers and the 'potential Pareto compensation principle'.<sup>16</sup>

A *Pareto improvement* is a change that makes at least one person better off without making anyone else worse off.<sup>17</sup> However, cost-benefit analysis imposes the weaker requirement of a *Kaldor-Hicks improvement*: the gainers must gain more from the change than the losers lose, so that the gainers could *in theory* compensate the losers.<sup>18</sup> Thus, for a proposal to pass muster, all that is required is that the total benefits must exceed the total costs. The benefits and costs may accrue to different sections of society, and there is no requirement that the losers be compensated.<sup>19</sup>

What bearing does this have on judicial decision-making? Coplan argues that the inability to claim compensation means that cost-benefit analysis should not be treated as determinative; in particular, 'downstream "losers" in strict cost-benefit analysis standard setting should argue for great latitude in agency departure from the results of cost-benefit analysis',<sup>20</sup> and 'judicial review of agency decision-making following cost-benefit analysis procedures ... should recognize the lack of compensation to victims as a reason for rejecting the guidance of cost-benefit analysis'.<sup>21</sup>

<sup>&</sup>lt;sup>16</sup> Ward and Duffield (n 10) 129.

<sup>&</sup>lt;sup>17</sup> Markandya and others (n 1) 148.

<sup>&</sup>lt;sup>18</sup> If they were *actually* compensated in full, the result would be an actual – not a potential – Pareto improvement.

<sup>&</sup>lt;sup>19</sup> Amartya Sen, 'The Discipline of Cost-Benefit Analysis' (2000) 29(S2) Journal of Legal Studies 931, 947. This applies to utilitarianism more generally. As Rawls famously argued, the utilitarian legislator aims to make choices which would maximise satisfaction across society, much in the same way that an individual aims to make choices which would maximise her private satisfaction. Thus, '[u]tilitarianism does not take seriously the distinction between persons.' John Rawls, A Theory of Justice (first published 1971, Harvard University Press 2009) 27. For a criticism of the wealth-transfer effects of CBA in the context of environmental regulation, see Karl S Coplan, 'The Missing Element of Environmental Cost-Benefit Analysis: Compensation for the Loss of Regulatory Benefits' (2018) 30 Georgetown Environmental Law Review 281.

<sup>&</sup>lt;sup>20</sup> Coplan (n 19) 319–20.

<sup>&</sup>lt;sup>21</sup> ibid 320.

Moreover, strict cost-benefit analysis is blind to distributional effects.<sup>22</sup> As long as there is a net benefit to society, it is entirely possible that a proposal which passes cost-benefit analysis could make the rich richer and the poor poorer. Indeed, some critics of cost-benefit analysis contend that exacerbation of inequality is not only possible but likely. As Ackerman and Heinzerling argue, in general 'the rich are able and willing to pay for more than the poor',<sup>23</sup> and if valuation is based on willingness-to-pay, cost-benefit analysis allows 'environmental burdens to flow downhill along the income gradients of an unequal world'.<sup>24</sup>

Arguably, this raises the stakes for accurate valuation. Where the burden of a policy falls disproportionately on those who are already worse off, it is more important than ever to ensure that the welfare losses they suffer are fully accounted for in the decision-making process.

#### 7.2.3 Burden-sharing and the need for accuracy

A third difference relates to the way burdens are shared. As Johnson et al explain:

Benefit-cost analysis generally is used as a guide to policy decisions in combination with information on other factors important to policy makers. Errors in estimating benefits and costs may or may not influence realized outcomes, and realized benefits and costs usually are distributed broadly among many gainers and losers in the population. In contrast, the costs of NRD [natural resource damage] compensation may be borne by a single or a few responsible parties. Of course, these payments are appropriate to the extent that they accurately internalize external costs responsible parties impose on society. However, unlike errors in benefit-cost

<sup>&</sup>lt;sup>22</sup> Cass R Sunstein, 'Cost-Benefit Default Principles' (2001) 99(7) *Michigan Law Review* 1651, 1720: 'The term "distributional effects" refers to the description of the net effects of a regulatory alternative across the population and economy, divided up in various ways (e.g., income groups, race, sex, industrial sector).'

<sup>&</sup>lt;sup>23</sup> Ackerman and Heinzerling (n 9) 1574.

<sup>&</sup>lt;sup>24</sup> ibid 1575. See also Robert Kuttner, *Everything for Sale: The Virtues and Limits of Markets* (University of Chicago Press 1999) 301: 'There is, in the cost-benefit exercise, a not very subtle class bias. The people who suffer the injuries and deaths from occupational hazards and diseases are almost never corporate executives, accountants, or economists.'

estimates, any overstatement of external costs will be borne entirely by one or a few responsible parties.<sup>25</sup>

Johnson's warning is to do with 'overstatement of external costs', but undervaluation would have equally undesirable consequences: namely under-compensation to victims of environmental damage. The consequences can also project into the future: if the relevant statutes or regulations tend towards undervaluation, or if undervaluation sets a judicial precedent, it makes environmental damage 'cheaper', reducing incentives to take adequate precautions and increasing the risk of future damage.

On similar lines, Desvousges *et al* have argued that contingent valuation ('CV'), whose reliability is more contested than revealed preference methods of valuation,<sup>26</sup> is more suitable in an *ex ante* setting (such as for purposes of cost-benefit analysis) where the costs of errors are more widely shared, as opposed to *ex post* valuation of natural resource damage.<sup>27</sup>

# 7.2.4 Environmental costs versus benefits

In cases involving retrospective valuation (natural resource damages), courts are typically concerned with quantification only of environmental *costs*. But cost-benefit analysis – depending on the proposal in question – may involve quantification of environmental costs (as in the case of cost-benefit analysis of offshore drilling, where the potential benefits include discovery of oil and gas, but at the cost of adverse environmental effects on the coastal zone)<sup>28</sup> or environmental *benefits* (as with cost-

<sup>&</sup>lt;sup>25</sup> F Reed Johnson and others, 'Role of Knowledge in Assessing Nonuse Values for Natural Resource Damages' (2001) 32(1) *Growth and Change* 43, 62.

<sup>&</sup>lt;sup>26</sup> For a fuller discussion, see Chapter 2, Section 2.3.2.

<sup>&</sup>lt;sup>27</sup> Desvousges and others (n 6) 113. They conclude: 'Our results demonstrate substantial problems in trying to use CV to measure nonuse values in a damage-assessment situation.' ibid 114.

<sup>&</sup>lt;sup>28</sup> California by Brown v Watt 668 F 2d 1290 (DC Cir 1981).

benefit analysis of fuel economy standards, where the potential environmental benefits include cleaner air, but at a cost to vehicle manufacturers and drivers).<sup>29</sup>

## 7.2.5 *Statutory framework*

So far in this section I argued that the *theoretical* context of valuation can be quite different, depending on whether the valuation is prospective or retrospective. When we turn our attention to legal cases involving environmental valuation, the framework of applicable statutes, rules and regulations is also different for prospective and retrospective valuation cases. This framework plays a significant role in shaping the valuation exercise, and thus forms an integral part of the context of environmental valuation in court.

In the US, most prospective valuation cases involve challenges to regulatory costbenefit analyses. Such analysis is required for certain types of regulatory action, under President Clinton's Executive Order 12,866<sup>30</sup> and President Obama's Executive Order 13,563.<sup>31</sup> Enabling statutes (which authorise regulations or regulatory action) such as the Endangered Species Act<sup>32</sup> or the Clean Water Act<sup>33</sup> may also prohibit, permit or require cost-benefit analysis – and if they are silent or ambiguous on the matter, a court may be called upon to resolve the ambiguity.<sup>34</sup> In India, formal costbenefit analysis of regulatory action is less widespread,<sup>35</sup> but an example of a

<sup>&</sup>lt;sup>29</sup> Center for Biological Diversity v National Highway Traffic Safety Administration 508 F 3d 508 (9th Cir 2007) ('CBD').

<sup>&</sup>lt;sup>30</sup> 58 Fed Reg 51735 (1993).

<sup>&</sup>lt;sup>31</sup> 76 Fed Reg 3821 (2011).

<sup>&</sup>lt;sup>32</sup> 16 USC 1531 et seq.

<sup>&</sup>lt;sup>33</sup> 33 USC 1251 et seq.

<sup>&</sup>lt;sup>34</sup> For examples of statutes in each of these categories, wording of relevant provisions and judicial interpretation thereof, see Chapter 3, Section 3.4.2.

<sup>&</sup>lt;sup>35</sup> However, independent researchers have carried out cost-benefit analysis of specific sectors, projects and initiatives. See e.g. Inamul Haq, S Kumar and SP Chakrabarti, 'Cost-Benefit Analysis of Control Measures in Cement Industry in India' (1997) 23(1) *Environment International* 33; A Markandya and MN Murty, 'Cost–Benefit Analysis of Cleaning the Ganges: Some Emerging Environment and Development Issues' (2004) 9(1) *Environment and Development Economics* 61; Sam Godfrey, Pawan Labhasetwar and Satish Wate, 'Greywater Reuse in Residential Schools in Madhya Pradesh, India – A Case Study

statutory requirement for prospective valuation appears in the Compensatory Afforestation Fund Act. The provision in question requires quantification of the environmental services provided by a forest area which is proposed to be diverted for non-forestry uses.<sup>36</sup>

Retrospective valuation cases in the US mostly fall under the rubric of natural resource damages, governed by statutes such as the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA),<sup>37</sup> the Oil Pollution Act,<sup>38</sup> and rules framed thereunder, which specify what forms of value should be included in damage assessments and how to measure them.<sup>39</sup> In India, the National Green Tribunal Act, among others, provides for restitution of the environment and compensation to the victims of pollution and other environmental damage,<sup>40</sup> though it does not lay down a methodology for quantifying the damage.

Thus, in both prospective and retrospective contexts, statutes, rules, regulations or executive orders may prohibit, permit or require environmental valuation (or they may be silent on the issue). They may specify the types of values to be taken into account (e.g. limiting valuation to use values only, or permitting the inclusion of non-use values such as option and existence values) and the valuation methods to be used (e.g. mandating, permitting or proscribing the use of specific methods). Where applicable rules or guidelines exist, they may enable, constrain or otherwise influence environmental valuation in court.

of Cost–Benefit Analysis' (2009) 53(5) *Resources, Conservation and Recycling* 287. These and other examples are cited in Michael A Livermore, 'Can Cost-Benefit Analysis of Environmental Policy Go Global' (2011) 19 *NYU Environmental Law Journal* 146, 157–58.

<sup>&</sup>lt;sup>36</sup> Compensatory Afforestation Fund Act, 2016, s 2(j).

<sup>&</sup>lt;sup>37</sup> 42 USC 9601–75.

<sup>&</sup>lt;sup>38</sup> 33 USC 2701–2761.

<sup>&</sup>lt;sup>39</sup> Relevant rules include the Type A and Type B rules framed under CERCLA (codified at 43 CFR Part 11, the Type A rules specify 'standard procedures for simplified assessments' and Type B rules specify 'alternative protocols for conducting assessments in individual cases') and natural resource damage assessment rules framed under the Oil Pollution Act (codified at 15 CFR Part 990).

<sup>&</sup>lt;sup>40</sup> National Green Tribunal Act, 2010, s 15(1).

However, within that framework, depending on the jurisdiction and the applicable law, judges have varying degrees of discretion. Court decisions about environmental valuation, whether retrospective or prospective, involve a series of subsidiary choices: what forms of value should count in the calculus,<sup>41</sup> what methods should be used to quantify those values,<sup>42</sup> and what role economists and other experts should play in the process.<sup>43</sup> But prior to those choices, there is sometimes a more fundamental decision to be made, namely whether to use valuation at all.

In the next three sections, I show that judges make these decisions, or choices, in both prospective and retrospective valuation cases. Depending on the context, the outcomes vary (for instance, non-use values may be admissible in some categories of cases but not in others) in different categories of cases, and sometimes, depending on context, even within the same category.

#### 7.3 Step zero: To value or not to value

The use of valuation is not necessarily a foregone conclusion. For one, attempts to quantify intangible values have been questioned and criticised on a variety of grounds: methodological (e.g. questioning the reliability of willingness-to-pay as a proxy for welfare<sup>44</sup>), philosophical (e.g. for its anthropocentric bias<sup>45</sup> and assumption of commensurability<sup>46</sup>) and generally for being value-laden and opaque.<sup>47</sup>

Additionally, some decisions could potentially be made without employing formal environmental valuation techniques. In both prospective and retrospective valuation

<sup>&</sup>lt;sup>41</sup> Forms of economic value are discussed in Chapter 2, Section 2.2.1.

<sup>&</sup>lt;sup>42</sup> See Chapter 2, Section 2.3.

<sup>&</sup>lt;sup>43</sup> See Chapter 8.

<sup>&</sup>lt;sup>44</sup> See e.g. Robert K Niewijk, Note, 'Ask a Silly Question: Contingent Valuation of Natural Resource Damages' (1992) 105 *Harvard Law Review* 1981; Mark Sagoff, *The Economy of the Earth: Philosophy, Law, and the Environment* (2nd edn, Cambridge University Press 2008) ch 4.

<sup>&</sup>lt;sup>45</sup> See Chapter 2, Section 2.4.1.

<sup>&</sup>lt;sup>46</sup> Kuttner (n 24) 301; Elizabeth Anderson, *Value in Ethics and Economics* (Harvard University Press 1995) 190–210; John O'Neill, Alan Holland and Andrew Light, *Environmental Values* (Routledge 2008) 77.

<sup>&</sup>lt;sup>47</sup> Ackerman and Heinzerling (n 9) 1576–78.

cases, courts have played a role in deciding whether or not to use monetary valuation at all.

#### 7.3.1 Prospective valuation

In Chapter 3, I classified legal challenges relating to environmental cost-benefit analyses by US regulatory agencies into two categories: authorisation challenges and adequacy challenges. The chapter itself focused mostly on the second category – adequacy challenges which involve courts scrutinising the valuation of environmental costs or benefits. However, it is the class of cases involving authorisation challenges to cost-benefit analyses which typically involve courts making a 'step zero' decision on whether to value or not to value.<sup>48</sup> To recapitulate, authorisation challenges are cases where (a) an agency decision to rely on cost-benefit analysis in rule-making was challenged on the basis that it was statutorily not authorised or prohibited from doing so, or (b) an agency decision *not* to rely on costbenefit analysis ('CBA') was challenged on the basis that it was required to do so.<sup>49</sup>

The 'step zero' question may be answered in the negative, for instance, in *Whitman v Am Trucking Ass'ns* ('*Whitman*'),<sup>50</sup> where the US Supreme Court held that in the absence of explicit statutory authorisation, the Environmental Protection Agency ('EPA') is not allowed to consider implementation costs in setting ambient air quality standards under the Clean Air Act ('CAA').<sup>51</sup> The court emphasised that the provision in question must be 'interpreted in its *statutory and historical context* and with appreciation for its importance to the CAA as a whole',<sup>52</sup> and refused to 'find implicit

<sup>&</sup>lt;sup>48</sup> To be precise, they typically involve a decision on whether or not to use cost-benefit analysis. However, as noted above (see Chapter 3, Section 3.3.1) in this thesis I use the term cost-benefit analysis to denote a decision procedure where *at least some of the costs* and *at least some of the benefits* of an action are expressed in terms of a common metric (typically monetary units) for purposes of comparison. Therefore, a decision to use (or not to use) cost-benefit analysis, by definition, entails a decision to use (or not use) some form of valuation.

<sup>&</sup>lt;sup>49</sup> See Chapter 3, Section 3.4.2 for a fuller discussion.

<sup>&</sup>lt;sup>50</sup> 531 U.S. 457 (2001).

<sup>&</sup>lt;sup>51</sup> Ibid 468.

<sup>&</sup>lt;sup>52</sup> ibid 472 (emphasis added).

in ambiguous sections of the CAA an authorisation to consider costs that has elsewhere, and so often, been expressly granted'.<sup>53</sup> Similarly, the DC Circuit Court has held that 'the [CAA] and its legislative history make clear that economic considerations play no part in the promulgation of ambient air quality standards'.<sup>54</sup>

In other contexts, US courts have held that the agency has discretion as to whether or not to use quantified CBA. In *Entergy Corp. v Riverkeeper, Inc.*,<sup>55</sup> the Supreme Court held that although Section 316(b) of the Clean Water Act ('CWA') – which requires the EPA to set performance standards such that water intake structures of power plants 'reflect the best technology available for minimizing adverse environmental impact'<sup>56</sup> – is silent on CBA, it was permissible for the EPA to rely on CBA in setting such standards.<sup>57</sup> The outcome in this case was obviously different from *Whitman*, but once again the court's analysis rested on a consideration of the legislative framework and the inferred intent of Congress.<sup>58</sup>

The closest that US courts have come to answering the 'step zero' question in the affirmative, that is, *requiring* the agency to undertake valuation, is in the recent case of *Michigan v EPA* ('*Michigan*'),<sup>59</sup> where the Supreme Court held, by a 5–4 majority, that the EPA acted unreasonably when it deemed cost irrelevant to its decision to regulate power plants under the CAA.<sup>60</sup> The court held that the EPA 'must consider cost',<sup>61</sup> but followed up with a key clarification: '[w]e need not and do not hold that the law unambiguously required the Agency ... to conduct a formal cost-benefit

<sup>&</sup>lt;sup>53</sup> ibid 467. 'Congress, we have held, does not alter the fundamental details of a regulatory scheme in vague terms or ancillary provisions – it does not, one might say, hide elephants in mouseholes.' ibid 468.

<sup>&</sup>lt;sup>54</sup> Lead Industries Ass'n v EPA 647 F 2d 1130 (DC Cir 1980) 1148.

<sup>&</sup>lt;sup>55</sup> 556 US 208 (2009).

<sup>&</sup>lt;sup>56</sup> 33 USC 1251 et seq., 1326(b).

<sup>&</sup>lt;sup>57</sup> Entergy (n 55) 226.

<sup>&</sup>lt;sup>58</sup> ibid 219–20: 'When Congress wished to mandate the greatest feasible reduction in water pollution, it did so in plain language ... It seems to us, therefore, that the phrase "best technology available," even with the added specification "for minimizing adverse environmental impact," does not unambiguously preclude cost-benefit analysis.'

<sup>&</sup>lt;sup>59</sup> 135 S Ct 2699 (2015).

<sup>&</sup>lt;sup>60</sup> ibid 2712.

<sup>&</sup>lt;sup>61</sup> ibid 2711.

analysis in which each advantage and disadvantage is assigned a monetary value'. Thus, the court held that the agency was remiss in altogether failing to consider costs, but stopped short of requiring the agency to consider costs *quantitatively*. Instead, it was left agency 'to decide (as always, within the limits of reasonable interpretation) how to account for cost'.<sup>62</sup> As in *Whitman*, the majority relied explicitly on, and referred several times to, 'statutory context'.<sup>63</sup>

The Indian Supreme Court cases on forest valuation<sup>64</sup> evidence a distinct 'step zero' moment, where the court moved from a pure replacement cost paradigm to one which involved both replacement cost and valuation. Prior to the Supreme Court's intervention, the existing legal position was that when forest land was diverted for non-forest uses, the 'user agency', that is, the person or organisation making a request for diversion of forest land for non-forest purpose,<sup>65</sup> was required to pay 'compensatory levies' for the purpose of carrying out compensatory afforestation over an 'equivalent area of non-forest land'.<sup>66</sup>

In October 2002, the Supreme Court passed an order directing that, in addition to the compensatory afforestation levy, a user agency must also pay 'the net value of the forest land diverted for non-forest purposes'.<sup>67</sup> It also fixed the rate of net present value ('NPV') per hectare (subject to upward revision by the Ministry of Finance in

<sup>&</sup>lt;sup>62</sup> ibid. More decisively, the DC Circuit Court has subsequently held that '[t]he statute does not mandate a particular method of cost-benefit analysis'. *Nat'l Ass'n for Surface Finishing v EPA* 795 F 3d 1 (DC Cir 2015) 10. The difference may be summarised as: 'We do not hold that formal CBA is required' (*Michigan*) versus 'We hold that formal CBA is not required' (*Surface Finishing*).

<sup>&</sup>lt;sup>63</sup> 'It is not rational, never mind "appropriate," to impose billions of dollars in economic costs in return for a few dollars in health or environmental benefits. *Statutory context* supports this reading.' *Michigan* (n 59) 2701 (emphasis added). 'Statutory context reinforces the relevance of cost.' ibid 2708.

<sup>&</sup>lt;sup>64</sup> See Chapter 5 for a fuller discussion.

<sup>&</sup>lt;sup>65</sup> 'User agency' is defined in the Forest (Conservation) Rules, 2003, Rule 2(h).

<sup>&</sup>lt;sup>66</sup> Guidelines for Compensatory Afforestation, 2004, s 3.2(i).

<sup>&</sup>lt;sup>67</sup> T N Godavarman Thirumulpad v Union of India (SC 29 October 2002) reproduced in Ritwick Dutta and Bhupender Yadav, Supreme Court on Forest Conservation (3rd edn, Universal Law Publishing 2011) 205, 212.

consultation with the CEC).<sup>68</sup> The NPV calculation was modified in a subsequent order,<sup>69</sup> but the key point in the present context of the 'step zero' question is that the introduction of NPV marked a departure from the earlier, pure replacement cost paradigm. NPV, as discussed in Chapter 5,<sup>70</sup> is not a valuation method *per se*. Rather, it involves the valuer (a) putting a value on future benefits, and (b) discounting it by applying an appropriate discount rate. Thus, in order to calculate NPV, some form of monetary valuation is inevitable.

The statutory context, that is, the purpose of the levy for diversion of forest land, was once again crucial to the court's decision. In short, the court reasoned that the purpose of the levy was to compensate for the loss of natural forest,<sup>71</sup> but the existing practice of compensatory afforestation was inadequate for achieving this goal, and the additional imposition of NPV was therefore justified.<sup>72</sup> The environmental context was also a key factor in the decision: the court repeatedly referred to the public nature of forest land,<sup>73</sup> and the need to account for not just the economic but also the social and environmental cost of forest diversion.<sup>74</sup>

#### 7.3.2 Retrospective valuation

*Ohio v United States Department of the Interior*<sup>75</sup> ('*Ohio*') is the classic US decision on step zero in retrospective valuation. *Ohio* involved a general challenge to damage assessment rules framed under the Comprehensive Environmental Response,

<sup>68</sup> ibid.

<sup>&</sup>lt;sup>69</sup> T N Godavarman Thirumulpad v Union of India AIR 2005 SC 4256; MANU/SC/0596/2005 ('Godavarman 2005'). For a fuller discussion, see Chapter 5, Section 5.6.4.

<sup>&</sup>lt;sup>70</sup> See Chapter 5, Section 5.5.1.

<sup>&</sup>lt;sup>71</sup> The court traced the history of Indian forest legislation, beginning with the Forest Acts of 1927 and 1980, as well as the National Forest Policy, 1988. *Godavarman* 2005 (n 69) [72]-[73].

<sup>&</sup>lt;sup>72</sup> ibid [13]-[14].

<sup>&</sup>lt;sup>73</sup> 'Forestry is a public project.' ibid [28]. 'The State is the trustee of all natural resources which are by nature meant for public use and enjoyment. Public at large is the beneficiary of these resources.' ibid [69].

<sup>&</sup>lt;sup>74</sup> ibid 29.

<sup>&</sup>lt;sup>75</sup> 880 F 2d 432 (DC Cir 1989).

Compensation and Liability Act 1980 ('CERCLA').<sup>76</sup> One of the challenges, by state and environmental petitioners, was against the 'lesser of' rule, which provided that the measure of damages shall be 'the lesser of: restoration or replacement costs; or diminution of use values as the measure of damages'.77 The practical effect of the rule was that if lost use value was lower than the restoration cost, the damages award would be limited to the former (being the lesser of the two), and would therefore be insufficient to pay for the costs of restoration.78 After detailed consideration of the language, purpose and legislative history of CERCLA, the court invalidated the rule.<sup>79</sup> It held that restoration was 'the presumptively correct remedy for injury to natural resources'.<sup>80</sup> However, the court acknowledged that it could be legitimate for the Department of the Interior ('DOI') to establish a class of cases where the presumption could be overridden, 'where other considerations - *i.e.*, infeasibility of restoration or grossly disproportionate cost to use value - warrant a different standard.'81 In such cases, use value could supplant restoration cost as the measure of damages. The 'step zero' question was therefore answered in the affirmative, but only if the aforesaid conditions were met.

In Chapter 6, I identified three broad approaches which Indian courts have taken to the assessment and quantification of damages. First, the task may be delegated to a government authority or expert body (which I termed the 'delegation approach'). Second, damages may be awarded based partly or solely on the size of the enterprise, annual turnover or cost of the offending project ('percentage approach'). Third, there are some cases where, unfortunately, there is no obvious explanation as to how the court arrived at the final figure ('quantification unexplained').

<sup>&</sup>lt;sup>76</sup> *Ohio* (n 75) 438.

<sup>&</sup>lt;sup>77</sup> 43 CFR 11.35(b)(2) (1987). However, the rules did provide for an exception to the 'lesser of' rule: if restoration or replacement was not technically feasible, the measure of damages would be diminution in use values or other methodologies deemed acceptable under the rules. ibid 11.35(b)(3).

<sup>&</sup>lt;sup>78</sup> Ohio (n 75) 441.

<sup>&</sup>lt;sup>79</sup> ibid 442.

<sup>&</sup>lt;sup>80</sup> ibid 456.

<sup>&</sup>lt;sup>81</sup> ibid 459.

Only the first of these, the delegation approach, potentially involves an explicit quantification exercise. Where damages are based on the percentage approach, the amount of the award has no direct relationship to the environmental damage caused, and where there is no evident explanation, we clearly cannot say whether quantification was involved or not.

In 'delegation approach' cases, courts have awarded damages based on the cost of 'remedial measures'<sup>82</sup> or 'reversing [damage to] the ecology'.<sup>83</sup> At the same time, these orders for restoration costs have generally been accompanied by awards of compensation to individuals affected by the environmental damage.<sup>84</sup> However, as noted in Chapter 6,<sup>85</sup> the orders do not clearly specify the grounds of compensation. Environmental damage can cause damage to health and property, but also diminution of use and non-use values which can be estimated using environmental evaluation techniques.<sup>86</sup> The decision of whether to include diminution of use and non-use values in calculating the compensation payable to individuals has a direct impact on the amount of compensation awarded. But in the case of Indian retrospective damage cases, this is a decision that appears to have been left to the government authorities and expert bodies to whom the courts delegated the task of quantification.

<sup>&</sup>lt;sup>82</sup> Indian Council for Enviro-Legal Action v Union of India AIR 1996 SC 1446. The case involved chemical industries in Rajasthan which were operating without requisite government consents and illegally disposing of highly toxic sludge. For a fuller discussion, see Chapter 6.

<sup>&</sup>lt;sup>83</sup> Vellore Citizens Welfare Forum v Union of India AIR 1996 SC 2715 [27] ('Vellore'). The case involved discharge of untreated effluent by tanneries and other industries in the state of Tamil Nadu. For a fuller discussion, see Chapter 2. See also MC Mehta v Union of India (1997) 2 SCC 411 ('Calcutta Tanneries case') [22]; MC Mehta v Kamal Nath (1997) 1 SCC 388 [32]; S Jagannath v Union of India AIR 1997 SC 811 ('Jagannath') [46].

<sup>&</sup>lt;sup>84</sup> Vellore (n 83) [27]; Calcutta Tanneries case (n 83) [22]; Jagannath (n 83) 46.

<sup>&</sup>lt;sup>85</sup> See Chapter 6, Section 6.5.1.

<sup>&</sup>lt;sup>86</sup> See e.g. Freeman and others (n 2); Jonathan M Harris and Brian Roach, *Environmental and Natural Resource Economics: A Contemporary Approach* (3rd edn, ME Sharpe 2013); Timothy C Haab and Kenneth E McConnell, *Valuing Environmental and Natural Resources: The Econometrics of Non-Market Valuation* (Edward Elgar 2002).

## 7.4 Categories of value

Economists classify *total economic value* – an all-encompassing measure of the economic value of an environmental resource<sup>87</sup> – into use and non-use values.<sup>88</sup> In a subset of the cases analysed in the foregoing chapters, courts have adjudicated upon the relevance or admissibility of certain categories of value. These cases may involve allegations of both under-inclusion (that relevant values were not included in the valuation calculus) or over-inclusion (that values were included when they should not have been).

#### 7.4.1 Prospective valuation

In the US, courts have upheld under-inclusion arguments by environmental petitioners with respect to cost-benefit analyses of a programme for the leasing of oil and gas drilling rights on the outer continental shelf ('OCS') which did not take into account 'the quantifiable impact of an oil spill upon fishing, tourism and other OCS-related enterprises',<sup>89</sup> and a rule setting fuel economy standards which assigned a zero value to the reduced emissions of CO<sub>2</sub> and other greenhouse gases.<sup>90</sup> However, an under-inclusion argument – non-inclusion of costs associated with jetty deterioration and coastal erosion in connection with the deepening of a river navigation channel – was rejected by the Ninth Circuit.<sup>91</sup>

The Ninth Circuit's environment-friendly decision upholding the under-inclusion challenge in *CBD* offers a particularly strong example of the role of statutory and social context. In finding the agency's decision to ignore the benefits of reduced greenhouse emissions arbitrary and capricious, the court emphasised that the

<sup>&</sup>lt;sup>87</sup> David Pearce, Giles Atkinson and Susana Mourato, *Cost-Benefit Analysis and the Environment: Recent Developments* (OECD 2006) 85.

<sup>&</sup>lt;sup>88</sup> For a fuller discussion, and sub-categories of use and non-use values, see Chapter 2, p 2.2.1.

<sup>&</sup>lt;sup>89</sup> Watt (n 28) 1319.

<sup>&</sup>lt;sup>90</sup> CBD (n 29). The 2007 decision was subsequently amended in *Center for Biological Diversity* v National Highway Traffic Safety Administration 538 F 3d 1172 (9th Cir 2008). However, the amendments related to a separate challenge which is not relevant for our purposes.

<sup>&</sup>lt;sup>91</sup> Northwest Environmental Advocates v National Marine Fisheries Service 460 F 3d 1125 (9th Cir 2006). See however Judge Fletcher's strong dissent, ibid 1145–62.

statutory purpose was to ensure that the agency's environmental assessment fosters 'both informed decision-making and informed public participation'.<sup>92</sup> The court justified its decision with reference to the goals of the Energy Policy and Conservation Act, 1975, which include 'the efficient utilization of scarce resources',<sup>93</sup> noting that:

[t]hese goals are more pressing today than they were thirty years ago: since 1975, American consumption of oil has risen from 16.3 million barrels per day to over 20 million barrels per day, and the percentage of U.S. oil that is imported has risen from 35.8 to 56 percent.<sup>94</sup>

The context of the agency's action – that it would 'affect the level of the nation's greenhouse gas emissions and impact global warming'<sup>95</sup> – as well as the wider societal context of increased fossil fuel dependence, were therefore key to the court's ruling that the agency's 'failure to monetize the value of carbon emissions ... was arbitrary and capricious'.<sup>96</sup>

US courts have rejected over-inclusion challenges by industry petitioners and private individuals with respect to cost-benefit analyses of energy efficiency rules, where the court held that the Department of Energy permissibly considered the rule's environmental benefits, in particular the estimated benefits of greenhouse gas reduction,<sup>97</sup> and the construction of a dam, where the inclusion of incidental recreational benefits of the dam (e.g. from fishing, bird watching, boating, hiking, etc.) was held to be reasonable.<sup>98</sup>

It is notable that the above cases all involved arguments about specific sub-categories of *use* value, such as recreational value, benefits from tourism and benefits of greenhouse gas reductions. Use value, as discussed in Chapter 2, is relatively less

<sup>&</sup>lt;sup>92</sup> *CBD* (n 29) 526–27, quoting *California v Block*, 690 F 2d 753 (9th Cir 1982) 761.

<sup>&</sup>lt;sup>93</sup> ibid 514.

<sup>&</sup>lt;sup>94</sup> ibid.

<sup>&</sup>lt;sup>95</sup> ibid 547.

<sup>&</sup>lt;sup>96</sup> ibid 558.

<sup>&</sup>lt;sup>97</sup> Zero Zone, Inc. v United States DOE 832 F 3d 654 (7th Cir 2016).

<sup>&</sup>lt;sup>98</sup> Webster v US Department of Agriculture 685 F 3d 411 (4th Cir 2012).

controversial and also more straightforward to measure.<sup>99</sup> Non-use values were implicated in only one case, and only in the dissent. In *Entergy*, the US Supreme Court rejected a challenge to the EPA's cost-benefit analysis of a rule which required power plants to take measures to minimise harm to aquatic organisms. However, Justice Stevens, in his dissent, criticised the EPA for counting only the 1.8 percent of species which are commercially or recreationally harvested, and giving zero value to the remaining 98.2 percent.<sup>100</sup> This, in effect, was a criticism of the EPA's failure to include the non-use values of organisms with no commercial or recreational value.

The Indian Supreme Court, in the context of prospective valuation of forests, gave explicit directions on the specific categories of value to be included in the calculus: the body of experts constituted under the court's orders was to 'take into account economic values associated with forests, viz., direct use values, indirect use values such as value of environmental benefits from the forest, option values and existence value.'<sup>101</sup> However, as discussed in Chapter 5, the valuation method ultimately used to calculate the value per hectare of forest land was heavily based on market value, and direct and indirect use values. Non-use values such as option and existence value ended up being largely overlooked.<sup>102</sup>

#### 7.4.2 Retrospective valuation

In Chapter 4, I categorised US retrospective valuation cases into those involving 'general challenges' and 'specific challenges'.<sup>103</sup> Both categories present us with cases where the admissibility of specific categories of value have been at issue.

The damage assessment rules which were challenged in *Ohio* laid down a hierarchy of methods for determining use values: market value was at the top of the hierarchy, and other methods could be used only if the market for the damaged resource was

<sup>&</sup>lt;sup>99</sup> See Chapter 2, section 2.3.2.

<sup>&</sup>lt;sup>100</sup> Entergy (n 55) 238.

<sup>&</sup>lt;sup>101</sup> *Godavarman* (2005) (n 69) [38], [49].

<sup>&</sup>lt;sup>102</sup> For a fuller discussion, see Chapter 5, Section 5.7.

<sup>&</sup>lt;sup>103</sup> *General challenges* pertain to the legality of natural resource damage assessment regulations, while *specific challenges* pertain to the calculation of damages in particular cases. For a fuller discussion, see Chapter 4.

not 'reasonably competitive'.<sup>104</sup> The court granted state and environmental petitioners' request for review with respect to that portion of the rules, holding that:

While it is not irrational to look to market price as *one* factor in determining the use value of a resource, it is unreasonable to view market price as the *exclusive* factor, or even the predominant one. From the bald eagle to the blue whale and snail darter, natural resources have values that are not fully captured by the market system.<sup>105</sup>

Thus, sub-categories of use value which are not reflected in the market price of a resource were also effectively included in the calculus.

Industry petitioners, on the other hand, challenged that portion of the rules which permitted estimation of option and existence values in the 'extraordinary circumstances'<sup>106</sup> when a use value could not be determined at all.<sup>107</sup> They argued that option and existence values are nonuse values, and as such should not be taken into consideration under any circumstances.<sup>108</sup> The court rejected this argument; it held that but inclusion of option and existence values was not only permissible but *prima facie* necessary:

Option and existence values may represent 'passive' use, but they nonetheless reflect utility derived by humans from a resource, and thus, *prima facie*, ought to be included in a damage assessment.<sup>109</sup>

In *General Electric v United States Department of Commerce*<sup>110</sup> ('*General Electric*'), petitioners challenged natural resource damage assessment rules<sup>111</sup> issued by the National Oceanic and Atmospheric Administration ('NOAA Rules') pursuant to the

<sup>&</sup>lt;sup>104</sup> 43 CFR 11.83(c)(1) (1987).

<sup>&</sup>lt;sup>105</sup> *Ohio* (n 75) 462–63.

<sup>&</sup>lt;sup>106</sup> 51 Fed Reg 27674 (1986) 27719.

<sup>&</sup>lt;sup>107</sup> 43 CFR 11.83(d)(5)(ii) (1987).

<sup>&</sup>lt;sup>108</sup> Ohio (n 75) 476 fn 77.

<sup>&</sup>lt;sup>109</sup> Ibid 464.

<sup>&</sup>lt;sup>110</sup> 128 F 3d 767 (DC Cir 1997).

<sup>&</sup>lt;sup>111</sup> 61 Fed Reg 440 (1996), codified at 15 CFR Part 990.

Oil Pollution Act 1990,<sup>112</sup> to the extent they allowed recovery of lost passive-use values, on the basis that this was not authorised by OPA. The court rejected the argument, holding that, on the contrary, 'Congress ... clearly intended to authorize trustees to recover passive-use values'.<sup>113</sup>

*Southern Refrigerated*<sup>114</sup> involved a *specific* challenge in the context of a natural resource damage claim under CERCLA. The defendants' truck, which was carrying agricultural fungicide, overturned and spilled part of its cargo into a river. Idaho sought recovery for the damage to the fish population in the river, based on three forms of lost value: commercial value, and recreational value and existence value.<sup>115</sup> The court recognised that 'these three values do exist and would be appropriate items of damage if proved at trial'.<sup>116</sup> It accepted Idaho's evidence for commercial and recreational value,<sup>117</sup> but found that the study seeking to establish existence value was not persuasive.<sup>118</sup> The court clarified that it did not mean to suggest that the fish in question had *no* existence value; rather, the study by Idaho was 'legally insufficient to establish existence value in this case'.<sup>119</sup>

#### 7.5 Valuation methods

The choice of valuation method(s), as explained in Chapter 2, is closely linked to the categories of value that are deemed to be relevant. Indeed, disputes which are ostensibly about the admissibility of certain valuation methods often end up being about the admissibility of certain *values*.

<sup>&</sup>lt;sup>112</sup> 33 USC 2701–2761.

<sup>&</sup>lt;sup>113</sup> ibid 778.

<sup>&</sup>lt;sup>114</sup> Idaho v Southern Refrigerated Transport, Inc. 1991 US Dist LEXIS 1869 (D Idaho).

<sup>&</sup>lt;sup>115</sup> ibid 54.

<sup>&</sup>lt;sup>116</sup> ibid.

<sup>&</sup>lt;sup>117</sup> ibid 56–60.

<sup>&</sup>lt;sup>118</sup> ibid 55–56.

<sup>&</sup>lt;sup>119</sup> ibid 56.

## 7.5.1 Prospective valuation

Some adequacy challenges in US courts have involved rulings on valuation methods. In Chapter 3, I classed adequacy challenges into two sub-categories: scope challenges and methodology challenges. The former category involves allegations of over- or under-inclusion of costs or benefits, and in some cases forms of value,<sup>120</sup> but not valuation methods *per se*. The latter category includes some cases where courts were not required to make decisions on valuation methods *per se*,<sup>121</sup> and some cases where they did, for instance in *Zero Zone, Inc. v United States DOE*,<sup>122</sup> a challenge to rules issued by the Department of Energy ('DOE') which aimed to improve the energy efficiency of commercial refrigeration equipment.<sup>123</sup> In its analysis, DOE considered the rule's environmental benefits – in particular the estimated benefits of greenhouse gas reduction, which the DOE monetised using the Social Cost of Carbon ('SCC').<sup>124</sup> The petitioners argued that DOE's response was satisfactory, and endorsed its use of SCC.<sup>126</sup>

The Indian Supreme Court, in the context of prospective valuation of forests, has noted that various methods existed for valuing intangible benefits, such as the travelcost method and contingent valuation,<sup>127</sup> and made the important point that the choice of method would depend on the type of benefit which is sought to be measured.<sup>128</sup> But ultimately, the court determined that a body of experts should

<sup>&</sup>lt;sup>120</sup> See Section 7.4.1 above.

<sup>&</sup>lt;sup>121</sup> For instance in *Ctr for Sustainable Econ v Jewell* 779 F 3d 588 (DC Cir 2015), the petitioner, an environmental organisation, challenged the 'replacement-cost methodology' employed by the DOI in its cost-benefit analysis, but the challenge pertained to a specific *assumption* in the replacement-cost method (regarding the geographical areas where environmental costs arise), and not to the method itself.

<sup>&</sup>lt;sup>122</sup> 832 F 3d 654 (7th Cir 2016). For a fuller discussion, see Chapter 3, Section 3.5.5.

<sup>&</sup>lt;sup>123</sup> 79 Fed Reg 17726 (2014) and 79 Fed Reg 22278 (2014).

<sup>124 79</sup> Fed Reg 17777.

<sup>&</sup>lt;sup>125</sup> Zero Zone (n 122) 677.

<sup>&</sup>lt;sup>126</sup> ibid 678–79.

<sup>&</sup>lt;sup>127</sup> Godavarman (2005) (n 69) [35].

<sup>&</sup>lt;sup>128</sup> ibid [37]–[38].

recommend the most appropriate valuation method.<sup>129</sup> Net Present Value or NPV, described in Chapter 5, featured prominently in the judgment, but of course NPV is not a valuation method *per se*. As the court itself recognised, the NPV calculation simply entails the use of a discount rate to calculate the present value of future benefits, offset against costs.<sup>130</sup> In any event, the choice of NPV was also left to the experts.<sup>131</sup>

#### 7.5.2 Retrospective valuation

A major debate around valuation methods in US retrospective valuation cases relates to the admissibility of contingent valuation. In Chapter 4, I showed that US courts have *in general* endorsed the use of contingent valuation in natural resource damage assessments. In *Ohio* for example, industry petitioners argued that contingent valuation is too speculative, imprecise, untested, prone to overestimation and generally too flawed to be an admissible methodology.<sup>132</sup> However, the court rejected the challenge, and sustained the Department of Interior's conclusion that contingent valuation is a 'best available procedure' under CERCLA.<sup>133</sup> Likewise, the use of contingent valuation under NOAA Rules has also been upheld: the court acknowledged that 'contingent valuation is not without controversy'<sup>134</sup> but noted that an NOAA-commissioned special panel, which included two Nobel laureates, concluded that a rigorously-conducted contingent valuation study 'can produce estimates reliable enough to be the starting point of a judicial process of damage assessment'.<sup>135</sup>

<sup>&</sup>lt;sup>129</sup> ibid [38], [49].

<sup>&</sup>lt;sup>130</sup> ibid [31].

<sup>&</sup>lt;sup>131</sup> ibid [38].

<sup>&</sup>lt;sup>132</sup> Ohio (n 75) 476.

<sup>&</sup>lt;sup>133</sup> ibid 478.

<sup>&</sup>lt;sup>134</sup> General Electric v United States Department of Commerce 128 F 3d 767 (DC Cir 1997) 772.

<sup>&</sup>lt;sup>135</sup> Kenneth Arrow and others, 'Report of the NOAA Panel on Contingent Valuation' 58 Fed Reg 4601 (1983) 4610.

#### 7.6 Conclusion

An underlying theme of this thesis – most obviously in Chapter 2 but also recurring in the four case-study chapters – is the idea that environmental value is not purely objective, and certainly not in the same sense that, say, the spot price of gold at a given time is an objective number. Nor is estimating that value a *purely* technical exercise, in the sense that, say, calculating the market capitalisation of a company is a technical exercise.<sup>136</sup> In particular, valuation involves a series of assumptions, choices and value judgments – for example, whose welfare should count in the calculus, whether non-use values should be included, and if so, whether such values should be estimated based on willingness-to-accept or willingness-to-pay, and so on – and these assumptions, choices and value judgments have a significant impact on the end result.

In this chapter I argued that since environmental valuation is implicated in a wide variety of cases (including both prospective and retrospective valuation), these choices are made in a range of contexts. Prospective and retrospective valuation cases differ – both in terms of theoretical considerations and the applicable statutory framework. However, despite these differences, the cases share an important common feature: they involve judges making valuation choices, and those choices are driven by, and justified with reference to, the statutory and environmental context. Thus this chapter ties the four preceding case-study chapters together by showing that courts in each jurisdiction (the US and India) and in each category of case (prospective and retrospective) have implicitly or explicitly been making *valuation choices*, and furthermore, that those choices have been *context-driven*, that is, impelled by, or justified in light of, context.

<sup>&</sup>lt;sup>136</sup> The market capitalisation of a company, which is a measure of how much a company is worth on the open market, is given by the formula  $MC = N \times P$  where MC is the market capitalisation of the company in question, N is the number of shares of stock outstanding and P is the closing price per share of stock. Pamela Peterson Drake and Frank J Fabozzi, *The Basics of Finance: An Introduction to Financial Markets, Business Finance, and Portfolio Management* (John Wiley & Sons 2010) 396.

At the same time, environmental valuation does have important technical aspects which lie outside the expertise of most judges and lawyers, and which fall within the domain of economic or scientific experts. In the following chapter, I examine and classify the diverse ways in which experts have been involved in the valuation cases which I studied in Chapters 3 to 6. At the same time, I argue that the importance of contextual issues in valuation choices supports and legitimises an important role for judges in environmental valuation cases.

# Chapter 8 Judges and Experts; Judges *as* Experts

# 8.1 Introduction: choices and meta-choices

In Chapter 2, I emphasised that there are three fundamental choices (which I called *valuation choices*) that are entailed in any valuation of an environmental resource or amenity: whether to value or not to value (step zero); *what* to measure (the scope of the valuation exercise, including the specific resource or amenity to be valued and which categories of value are relevant); and *how* to measure them (which valuation methods to use for measuring the relevant values).

As we see in Chapters 3 to 6, in court cases involving environmental valuation, the relevant statute may prescribe how one or more of the valuation choices are to be made. The statute may contain *step zero provisions* which require, permit or prohibit environmental valuation. It may contain *what provisions*, for instance, defining issues of standing (i.e. whose welfare should count), or prescribing whether non-use values such as option and existence value should be included in the valuation. And it may contain *how provisions* which require, prescribe, permit or prohibit the use of specific valuation methods. However, statutes may also be – and indeed frequently are – silent or ambiguous with respect to one or more of these choices.

When a statute is thus silent or ambiguous, a court may be required to interpret it. Indeed, as highlighted in Chapter 7, the cases in Chapters 3 to 6 – directly or as ancillary questions, explicitly or implicitly – involved such interpretation, and concomitant choices. The choices were made by a judge or a panel of judges (the case studies do not include any jury trials, since the questions at issue are invariably matters of law, not of fact). In some cases, the court has sought assistance from experts (who may include not just economists but also experts in other areas such as biology and statistics). Thus in those cases, in addition to the three valuation choices enumerated above, the court had to make a meta-choice – a choice as to *who should*
*make those choices* – that is, whether to involve experts in making the choices, and if so, which experts, and what their role should be.

Expert involvement in environmental valuation cases is not limited to courtappointed experts. In natural resource damage cases (see Chapter 4), opposing parties frequently field their own expert witnesses who, not altogether surprisingly, tend to disagree about the appropriate measure of damages, and often about one or more of the valuation choices (for instance, whether certain values should be included in the calculation, or what valuation methods are appropriate). Finally, an expert analysis or determination may itself be the subject matter of the dispute, as in the case of challenges to regulatory cost-benefit analysis (see Chapter 3). In both cases, courts are once again faced with a similar meta-choice about who should make the valuation choices: in the former case, adjudicating between the testimonies of rival experts, and in the latter, determining how much deference to accord to the impugned expert analysis or determination.

I contend that the case studies in Chapters 3 to 6 yield interesting insights into the role of judges vis-à-vis that of experts – the long-standing specialist versus generalist debate. In light of the highly technical nature of environmental valuation, one might legitimately query what role experts can or should play in determining whether (and if so, how) valuation should be carried out. Drawing on the case-studies as well as general literature on judicial expertise and the role of experts in court, I first identify several ways in which experts have been involved in environmental valuation cases. I define the contours of the traditional 'judges versus experts' debate, and then go on to argue that this adversarial framing downplays three key facets of environmental valuation in the courtroom and the role of judges therein. This recognition paves the way for a reconceptualisation of the relationship between judges and experts, and the nature of judicial expertise itself.

#### 8.2 Experts in environmental valuation cases

#### 8.2.1 *Court-appointed experts*

The *Godavarman* case in India, as discussed in Chapter 5, is ongoing for over 20 years, and has generated several hundred orders which have profoundly shaped the valuation of forest land in India.<sup>1</sup> Experts have been involved at several stages along the way. In 2002, the Supreme Court constituted a national-level Central Empowered Committee ('CEC') to assist the court and to monitor implementation of its orders.<sup>2</sup> In its subsequent order later that year, the court explicitly relied on the CEC's 2002 recommendations in (a) holding that when forest land is diverted for non-forestry purposes, net present value<sup>3</sup> of such forest land should be recovered from the user agency,<sup>4</sup> and (b) fixing the rate of NPV per hectare (subject to upward revision by the Ministry of Finance in consultation with the CEC).<sup>5</sup>

In its landmark 2005 order, the court directed that an expert committee consisting of Kanchan Chopra from the Institute of Economic Growth, Delhi and two other experts ('Chopra Committee') be constituted.<sup>6</sup> The committee's terms of reference are discussed in detail in Chapter 5,<sup>7</sup> but in short, it was tasked with formulating 'a practical methodology' to estimate the value of different categories of forest land, as well as determine who should pay the costs of restoration and/or compensation.<sup>8</sup>

<sup>&</sup>lt;sup>1</sup> For a fuller account, see Chapter 5. Ritwick Dutta and Bhupender Yadav, *Supreme Court on Forest Conservation* (3rd edn, Universal Law Publishing 2011) provide an overview of the case and compiled the various Supreme Court orders (many of which are unreported) from 1996 to 2011.

<sup>&</sup>lt;sup>2</sup> *T N Godavarman Thirumulpad v Union of India* (SC 29 October 2002) reproduced in Dutta and Yadav (n 1) 189, 190 ('*Godavarman 2002*').

<sup>&</sup>lt;sup>3</sup> For an explanation of NPV and how it is calculated, see Chapter 5, Section 5.5.

<sup>&</sup>lt;sup>4</sup> 'User agency' is defined in the Forest (Conservation) Rules, 2003, Rule 2(h), and refers to the person or organisation making a request for diversion of forest land for non-forest purpose.

<sup>&</sup>lt;sup>5</sup> *Godavarman* 2002 (n 1) 205, 212.

<sup>&</sup>lt;sup>6</sup> *T N Godavarman Thirumulpad v Union of India* AIR 2005 SC 4256; MANU/SC/0596/2005 [101] ('Godavarman 2005').

<sup>&</sup>lt;sup>7</sup> See Chapter 5, Section 5.6.4.

<sup>&</sup>lt;sup>8</sup> Godavarman 2005 (n 6) [101].

After extensive national-level consultations, the Chopra Committee submitted its report in May 2006.<sup>9</sup> In January 2007, following discussions with the Ministry of Finance and the Chopra Committee, the CEC filed its own report ('CEC 2007 Report').<sup>10</sup> The recommendations of this latter CEC report were adopted, essentially unchanged, by the Supreme Court in 2008,<sup>11</sup> but, as highlighted in Chapter 5,<sup>12</sup> there were several important differences between the Chopra Committee Report and the CEC 2007 Report. In any case, the court-appointed experts in the Chopra Committee and the CEC had a significant influence on the calculation of NPV and valuation of forest land.

In Chapter 6, I identified three broad approaches which Indian courts have taken to the assessment and quantification of retrospective damages: first, the task may be delegated to a government authority or expert body; second, damages may be awarded based partly or solely on the size of the enterprise, annual turnover or cost of the offending project; and third, there are some cases where, unfortunately, there is no obvious explanation as to how the court arrived at the final figure.

Valuation experts have had a role to play in the first category of cases. In *Vellore,* the court tasked the Central Government with quantifying the damages, and gave detailed directions on who would carry out this task and how.<sup>13</sup> The Central Government was directed to constitute an authority under the Environment Act; it was to be headed by a retired High Court judge, which 'may have other members – preferably with expertise in the field of pollution control and environment protection

<sup>&</sup>lt;sup>9</sup> Kanchan Chopra and others, 'Report of the Expert Committee on Net Present Value' (2006) <<u>http://www.fedmin.com/upload/npvk.pdf</u>> accessed 18 October 2017. The hearings and consultations are detailed in section 1.3 and appendices 1–3 of the report.

<sup>&</sup>lt;sup>10</sup> Central Empowered Committee, 'Supplementary Report in IA No. 826 in IA No. 566 Regarding Calculation of Net Present Value (NPV) Payable on Use of Forest Land of Different Types for Non-Forest Purposes' (2 January 2007). <<u>http://www.prsindia.org/uploads/media/Compensatory%20Afforestation/bill185\_20080</u> <u>723185\_Central\_Empowered\_Committee\_Guidelines.pdf</u>> accessed 19 October 2017.

<sup>&</sup>lt;sup>11</sup> *T N Godavarman Thirumulpad v Union of India* (2008) 7 SCC 126; MANU/SC/7562/2008 [9]– [10].

<sup>&</sup>lt;sup>12</sup> See Chapter 5, Section 5.7.

<sup>&</sup>lt;sup>13</sup> Vellore Citizens Welfare Forum v Union of India AIR 1996 SC 2715 ('Vellore') [27].

– to be appointed by the Central Government'.<sup>14</sup> Courts have made similar orders in other cases, in one case delegating quantification to the State Government,<sup>15</sup> (as opposed to the Central Government, as in *Vellore*) and in another case to the National Environmental Engineering Research Institute ('NEERI'), a government research institute.<sup>16</sup>

However, expert reports are not necessarily accepted without question. In *Indian Council for Enviro-Legal Action v Union of India*,<sup>17</sup> NEERI prepared a report pursuant to an earlier order of the Supreme Court,<sup>18</sup> where it estimated the cost of damage and suggested that it 'needs to be borne by the management of the industry in keeping with the Polluter Pays principle' and the doctrine of strict/absolute liability.<sup>19</sup> However, the court held that estimating the cost of remedial measures is 'not a technical matter within the expertise of NEERI officials', and that, the estimate was made two years ago and the situation, if anything, had probably deteriorated further.<sup>20</sup> The court therefore ordered that the cost of remedial measures be determined by the Central Government, being the appropriate authority under the Environment (Protection) Act, 1986.<sup>21</sup>

My case studies only include *Indian* cases where the court appointed experts, but as Posner notes in the context of US court proceedings:

[a] little-used provision, Rule 706 [of the Federal Rules of Evidence], permits the judge to appoint an expert witness to be a court witness,

<sup>&</sup>lt;sup>14</sup> ibid.

<sup>&</sup>lt;sup>15</sup> *MC Mehta v Union of India* (1997) 2 SCC 411 [22].

<sup>&</sup>lt;sup>16</sup> *MC Mehta v Kamal Nath* (1997) 1 SCC 388 [32].

<sup>&</sup>lt;sup>17</sup> Indian Council for Enviro-Legal Action v Union of India AIR 1996 SC 1446.

<sup>&</sup>lt;sup>18</sup> ibid [16].

<sup>&</sup>lt;sup>19</sup> ibid [38], citing National Environmental Engineering Research Institute, 'Restoration of Environmental Quality of the Affected Area Surrounding Village Bichhri Due to Past Waste Disposal Activities' (1994) para 7.4.

<sup>&</sup>lt;sup>20</sup> ibid [68].

<sup>&</sup>lt;sup>21</sup> ibid [67], [70].

a neutral; it is little used, in part, because judges lack confidence in their ability to pick a neutral.<sup>22</sup>

## 8.2.2 *Expert witnesses*

In the US, experts have been directly involved as witnesses in specific challenges to the use of contingent valuation ('CV') in natural resource damage assessments, but less so in general challenges.<sup>23</sup> The decision in *Southern Refrigerated*<sup>24</sup> a general challenge, is a good example of extensive expert involvement.

*First,* the court relied on testimony of experts from the Department of Fish and Game ('F&G') in finding that damages recovered could be used by Idaho to improve the habitat for steelhead salmon.<sup>25</sup>

*Second*, experts testified on the methods used to estimate the fish population in the river (damage valuation in a case such as this requires an estimate of the number of fish killed, for which the first step is to determine how many fish were in the river prior to the spill).<sup>26</sup> The court noted that at trial, expert witnesses on both sides agreed that the methods used by F&G to estimate fish population densities, namely snorkelling and electrofishing, were accepted methods,<sup>27</sup> and cited 'evidence from the various experts' in finding that snorkel surveys at two sites were appropriate to establish a base line for determining how many fish were present in the entire river.<sup>28</sup> When it came to determining the base year, the court sided with defendants' experts,

<sup>&</sup>lt;sup>22</sup> Richard A Posner, 'The Law and Economics of the Economic Expert Witness' (1999) 13(2) *Journal of Economic Perspectives* 91, 92, citing Tahirih V Lee, 'Court-Appointed Experts and Judicial Reluctance: A Proposal to Amend Rule 706 of the Federal Rules of Evidence' (1988) Yale Law and Policy Review 6.

<sup>&</sup>lt;sup>23</sup> On the distinction between specific and general challenges, see Chapter 4, Section 4.4.

<sup>&</sup>lt;sup>24</sup> Idaho v Southern Refrigerated Transport, Inc. 1991 US Dist LEXIS 1869 (D Idaho). For the facts and other issues, see Chapter 4, Section 4.4.2.

<sup>&</sup>lt;sup>25</sup> ibid 32. This finding was not with respect to valuation *per se*; rather, it was in response to defendants' challenge with respect to how Idaho would use any damages recovered, and whether such use was authorised under CERCLA.

<sup>&</sup>lt;sup>26</sup> ibid 32–33.

<sup>&</sup>lt;sup>27</sup> ibid 34.

<sup>&</sup>lt;sup>28</sup> ibid 36. Defendants had argued that 'the snorkel sections represent only a very small percentage of the total surface area of the river'. ibid 35.

finding that since the spill occurred in December 1987, the base fish population should be determined using the 1987 snorkel study, rather than using a three-year (1985–87) average as Idaho had done.<sup>29</sup>

*Third*, the court weighed evidence from experts on both sides, on the number of fish killed as a result of the spill. Idaho relied on studies by an environmental toxicologist on steelhead fish to determine the effects of the chemical in question, and how the effects varied with concentration and duration of exposure.<sup>30</sup> Both parties also presented witnesses who had used the same computer model, namely Qual2e, to determine the chemical concentration in the river.<sup>31</sup> However, defendants' witness made some modifications to the model to allow for some variables not contained in the original program, in particular, subsequent dilution due to the river's flow and inflow from tributaries and other sources.<sup>32</sup> After discussing and weighing the conflicting testimonies in detail, the court disagreed with Idaho's contention of a 90–100% fish kill.<sup>33</sup>

In general challenge cases, on the other hand, courts have referred to experts, or occasionally, studies and reports prepared by experts, in the context of valuation (see Section 8.2.3 below), but expert involvement in such cases has been relatively indirect. In *Ohio*, industry petitioners challenged the rebuttable presumption conferred by CERCLA in favour of contingent valuation on the ground that it was arbitrary and capricious, expressing concern about 'the untested and hypothetical nature of CV methodology' and the lack of guidance on how it might be utilised.<sup>34</sup> The court disagreed, saying there was:

nothing arbitrary or irrational about the rebuttable presumption conferred upon natural resource assessments, including those utilizing CV methodology ... without which would loom the specter

<sup>&</sup>lt;sup>29</sup> ibid 37.

<sup>&</sup>lt;sup>30</sup> ibid 40–42.

<sup>&</sup>lt;sup>31</sup> ibid 41.

<sup>&</sup>lt;sup>32</sup> ibid.

<sup>&</sup>lt;sup>33</sup> ibid 44.

<sup>&</sup>lt;sup>34</sup> Ohio v United States Department of the Interior 880 F 2d 432 (DC Cir 1989) 478.

of prolonged battles of experts and other heavy burdens on the calendars of adjudicating tribunals.

The court, therefore, regarded the rebuttable presumption as a safeguard *against* the over-involvement of experts and technical challenges to the agency's valuation methodology, in subsequent cases under the natural resource damage assessment rules. So long as the agency met certain basic standards,<sup>35</sup> its damage assessment would be entitled to the presumption of validity.

## 8.2.3 *Expert studies and reports*

However, expert *studies* did influence the *Ohio* decision: the court noted that 'DOI surveyed a number of studies which analyzed the [contingent valuation] methodology, addressed the shortcomings of various questionnaires, and recommended steps needed to fashion reliable CV assessments'.<sup>36</sup> For this and other reasons, the court rejected industry petitioners' challenge to the inclusion of contingent valuation in the assessment methodology, and instead found that 'DOI's decision to adopt CV was made intelligently and cautiously'.<sup>37</sup>

Similarly in *General Electric*, another general challenge to CV, industry petitioners challenged NOAA Rules, arguing that NOAA acted arbitrarily and capriciously by authorising the use of contingent valuation<sup>38</sup> and not laying down stringent standards for its use.<sup>39</sup> The court rejected the challenge, citing the report of an NOAA-commissioned special panel, which included two Nobel laureates, and which concluded that a rigorously-conducted contingent valuation study 'can produce

<sup>&</sup>lt;sup>35</sup> Agency action may fail to meet the 'arbitrary and capricious' standard if, *inter alia*, it is 'so implausible that it could not be ascribed to a difference in view or the product of agency expertise'. *Motor Vehicles Manufacturers Ass'n v State Farm Mutual Automobile Insurance Co.* 463 US 29 (1983). Furthermore, when an agency relies upon an economic model, it is required to 'provide a full and analytical defense' of the model. *Eagle-Picher Industries Inc. v. EPA* 759 F 2d 905 (US App DC 1985) 921. Both these cases were cited in *Ohio* (n 34) 479.

<sup>&</sup>lt;sup>36</sup> Ohio (n 34) 477.

<sup>&</sup>lt;sup>37</sup> ibid 476.

<sup>&</sup>lt;sup>38</sup> General Electric v United States Department of Commerce 128 F 3d 767 (DC Cir 1997) 771.

<sup>&</sup>lt;sup>39</sup> ibid 773.

estimates reliable enough to be the starting point of a judicial process of damage assessment'.<sup>40</sup> Thus, like in *Ohio*, the court again upheld an agency rule authorising contingent valuation because it was found to be based on prior studies by experts in the field.

*United States v Montrose Chemical Corp.*<sup>41</sup> involved a damages claim for a release of DDT and other chemicals onto the Palos Verdes Shelf in Los Angeles Harbor, resulting in injuries to fish and bird habitats as well as deaths to a number of fish and endangered birds.<sup>42</sup> For the damage assessment, NOAA contracted with a group of economists including 'the leading practitioners of the contingent valuation method'<sup>43</sup> to develop an original contingent valuation study.<sup>44</sup> The study sought to follow 'best-available practices for survey design and administration'.<sup>45</sup> The instrument design

- <sup>42</sup> Thompson (n 41) 80.
- <sup>43</sup> ibid 81.

<sup>45</sup> Montrose Report (n 44) ii.

<sup>&</sup>lt;sup>40</sup> ibid 772, quoting Kenneth Arrow and others, 'Report of the NOAA Panel on Contingent Valuation' 58 Fed Reg 4601 (1983) 4610.

<sup>&</sup>lt;sup>41</sup> No CV 90-3122-AAH (JRx) (CD Cal 1990). Unreported case, discussed in Dale B Thompson, 'Valuing the Environment: Courts' Struggles with Natural Resource Damages' (2002) 32 *Environmental Law* 57, 80. Also discussed in Chapter 4, Section 4.4.2.

<sup>&</sup>lt;sup>44</sup> Natural Resource Damage Assessment, Inc. and Industrial Economics, Inc., 'Prospective Interim Lost Use Value Due to PCB and DDT Contamination in the Southern California Bight' (1994) <<u>https://econweb.ucsd.edu/~rcarson/papers/SCalDDT.pdf</u>> accessed 9 May 2019 ('the Montrose Report'). The title of the report refers to 'use value' only. However, the study in fact set out to measure total economic value, which is the sum of use and non-use values. This is evident both from the use of contingent valuation as the method of choice (the method is typically used when non-use values are sought to be included in the measurement, see Chapter 2, Section 2.3.3), and from an explanation in the report itself: 'The Ohio Court's term "passive use" plus what is known as "direct use" combine to form what is known as "total economic value". Total economic value forms the basis for the interim lost use value presented in this report.' Montrose Report (n 44) 2–3, referring to Ohio (n 34). The term 'passive use value' in Ohio clearly refers to non-use value (in the terminology of this thesis and of most environmental economics literature); this is evident from the Ohio court's statement that passive use value includes option and existence values. Ohio (n 34) 464. Thus, what the report refers to as 'use value' is actually the sum of direct use value and non-use value (referred to in Ohio and in the report as 'passive use value').

phase alone extended over 32 months, including focus groups, cognitive interviews and pilot studies, while the main survey involved 2,810 in-person interviews.<sup>46</sup>

However, NOAA also hired biological experts to determine the injuries to fish and birds. Unfortunately for NOAA, the economists who prepared the survey did not consult with the biological experts, and the defendants were able to establish 'numerous factual inconsistencies' between the scenarios described in the surveys, and the depositions of the NOAA's own biological experts.<sup>47</sup> As a result of the discrepancies, the court granted the defendants' motion to exclude the CV study.<sup>48</sup>

Finally, one of the specific challenges to CV provides a good example of a 'battle of experts', and the role of courts in adjudicating between contesting testimony. *Oklahoma v Tyson Foods, Inc.*<sup>49</sup> involved natural resource damages caused by excess phosphorus from poultry waste and other sources entering a river system and lake. The State of Oklahoma employed Stratus Consulting, Inc. ('Stratus'), a company which provides environmental research and consulting services,<sup>50</sup> as their damages experts, and it was Stratus's expert report<sup>51</sup> – seeking to estimate the damages based on a contingent valuation survey – that was at the heart of the dispute.<sup>52</sup> Initially, defendants moved to compel production of personal identification information of the survey respondents, arguing that it was needed to evaluate the accuracy and

<sup>48</sup> ibid 84.

<sup>50</sup> See

<sup>&</sup>lt;sup>46</sup> ibid.

<sup>&</sup>lt;sup>47</sup> Thompson (n 41) 82. For example, the survey stated that peregrine falcons have usually not been able to hatch any of their eggs and that their population was not increasing, both of which were contradicted by the biological experts' testimony.

<sup>&</sup>lt;sup>49</sup> 2009 US Dist LEXIS 133533 (ND Okla).

<sup>&</sup>lt;<u>https://www.bloomberg.com/research/stocks/private/snapshot.asp?privcapId=24861733</u> > accessed 10 May 2019. Stratus in turn hired three independent contractors, Wilson Research Strategies, Consumer Logic, Inc. and Westat, Inc.

<sup>&</sup>lt;sup>51</sup> Stratus Consulting, 'Natural Resource Damages Associated with Past Aesthetic and Ecosystem Injuries to Oklahoma's Illinois River System and Tenkiller Lake' (2009) < <u>https://pprg.stanford.edu/wp-content/uploads/9-Natural-resource-damages-associatedwith-aesthetic-and-ecosystem-injuries-to-Oklahomas-Illinois-river-system.pdf</u>> accessed 10 May 2019.

<sup>&</sup>lt;sup>52</sup> Tyson (n 49) 49–50.

reliability of the survey.<sup>53</sup> Defendants' expert, William H Desvousges, an environmental economist, attested that the identity of the individuals surveyed or questioned was necessary to 'fully critique' the damage assessment,<sup>54</sup> while the State's experts refuted this claim;<sup>55</sup> the court sided with the State.<sup>56</sup> This aspect of the dispute involved economic experts but not valuation *per se*, and as such it is less relevant for our purposes.

Later that year, defendants directly challenged the Stratus report – technically a Motion to Strike portions of the report – 'including but not limited to the Contingent Valuations survey portion of the Stratus Consulting report'.<sup>57</sup> Specifically, they objected to a representation made to the survey respondents that alum treatments would speed the recovery of the river system from the excess phosphorus deposits.<sup>58</sup> However, the experts clarified – to the court's satisfaction – that they were not opining as to the efficacy of alum treatments as they had no expertise in the area; rather, the scenario was used as a 'plausible' means to elicit respondents' 'truthful valuations of the scenario *outcome*',<sup>59</sup> and it was 'immaterial to the validity of the results whether the mechanism generating the outcome is fictitious as long as it is accepted by respondents'.<sup>60</sup>

#### 8.3 'Judges versus experts'

The foregoing Section 8.2 dealt with expertise in environmental valuation cases; this, of course, is the subject of this thesis, but before proceeding further, it is worth acknowledging that the 'judges versus experts' opposition (or indeed, the complementarity: see Section 8.6) is not unique to this field. Bowman, for instance, notes that the quantification of environmental value is 'difficult, but no more so than

<sup>&</sup>lt;sup>53</sup> ibid 62.

<sup>&</sup>lt;sup>54</sup> ibid 61–62.

<sup>&</sup>lt;sup>55</sup> ibid 63.

<sup>&</sup>lt;sup>56</sup> ibid 64.

<sup>&</sup>lt;sup>57</sup> Oklahoma v Tyson Foods, Inc. 2009 US Dist LEXIS 114870 (ND Okla) 17–18.

<sup>&</sup>lt;sup>58</sup> ibid 18.

<sup>&</sup>lt;sup>59</sup> ibid 19 (emphasis in original).

<sup>60</sup> ibid.

the calculation of compensation for ... an ordinary personal injuries claim ... or in a claim for damage to reputation, where no genuine market valuation exists.'<sup>61</sup> Judges and experts must grapple with similar issues also in the valuation of artistic works<sup>62</sup> and historical relics<sup>63</sup> (to cite just two examples), not to mention a plethora of other areas which do not involve valuation but do involve technical expertise.<sup>64</sup>

In matters of environmental valuation, courts have been criticised both for according too little and too much deference to experts. In *Corrosion Proof Fittings v EPA*,<sup>65</sup> the US Fifth Circuit struck down an asbestos regulation<sup>66</sup> promulgated by the Environmental Protection Agency (EPA) on the basis that the EPA's cost-benefit analysis was flawed.<sup>67</sup> The decision has been characterised by some scholars as judicial overreach;<sup>68</sup> in particular the judges have drawn criticism for vacating the rule when they 'lacked the breadth and depth of experience and expertise necessary to support such confident assertions about how the agency should go about its assigned business'.<sup>69</sup>

On the other hand, Binger *et al*, in their critique of the contingent valuation method ('CVM') in US natural resource damage assessments, urge judges to 'be willing to

<sup>&</sup>lt;sup>61</sup> Michael Bowman, 'The Definition and Valuation of Environmental Harm: An Overview' in in Michael Bowman and Alan Boyle (eds), *Environmental Damage in International and Comparative Law: Problems of Definition and Valuation* (Oxford University Press 2002) 14.

<sup>&</sup>lt;sup>62</sup> Douglas S Noonan, 'Valuing Arts and Culture: A Research Agenda for Contingent Valuation' (2004) 34(3) *Journal of Arts Management, Law, and Society* 205.

<sup>&</sup>lt;sup>63</sup> John Carman, Valuing Ancient Things: Archaeology and Law (Leicester University Press 1996).

<sup>&</sup>lt;sup>64</sup> See e.g. Sheila Jasanoff, Science at the Bar: Law, Science, and Technology in America (Harvard University Press 2009).

<sup>&</sup>lt;sup>65</sup> 947 F 2d 1201 (5th Cir 1991) ('Corrosion Proof Fittings').

<sup>&</sup>lt;sup>66</sup> Asbestos; Manufacture, Importation, Processing, and Distribution in Commerce Prohibitions, 54 Fed Reg 29460, 29483 (1989), codified at 40 CFR 763.

<sup>&</sup>lt;sup>67</sup> ibid 1218–19.

<sup>&</sup>lt;sup>68</sup> Thomas O McGarity, 'Courts and the Ossification of Rulemaking: A Response to Professor Seidenfeld' (1996) 75 *Texas Law Review* 525, 549.

<sup>&</sup>lt;sup>69</sup> ibid 547. See also Linda Stadler, 'Corrosion Proof Fittings v. EPA: Asbestos in the Fifth Circuit – A Battle of Unreasonableness' (1993) 6 Tulane Environmental Law Journal 423, 433 (describing the decision as a 'tragedy'). For a contrary view, see Jonathan S Masur and Eric A Posner, 'Cost-Benefit Analysis and the Judicial Role' (2018) 85(4) University of Chicago Law Review 935, 955 (arguing that Corrosion Proof Fittings 'should be celebrated as a high water-mark of judicial rationality').

avoid deference to agency policy and, instead, wrestle with the difficult conceptual basis of CVM in order to make their own determinations regarding whether CVM has a place in their courtrooms'.<sup>70</sup>

Scholarly debate around the respective role of judges and experts in valuation is frequently framed in terms of over-reach or over-deference, and more generally in terms of 'generalist judges' versus 'specialist experts'. Masur and Posner, for example, note that '[t]he major difference between judges and agency officials is that judges are generalists and agency officials are experts',<sup>71</sup> and Bull and Ellig acknowledge that one of the arguments against expanded judicial review is that 'laymen [would be] empowered to set aside the conclusions of experts'.<sup>72</sup> Likewise, in a study of cost-benefit analysis of financial regulations, Coates contrasts regulators, who 'have sharpened their intuitive sense of what kinds of regulations work and why' with 'non-experts, such as generalist judges'.<sup>73</sup>

The adversarial framing downplays three key facets of environmental valuation in the courtroom and the role of judges therein, which I explore in the next three sections of this chapter. The *first* point – emphasised in Chapter 2 but also a recurring theme in the case studies – is that the questions arising from environmental valuation are not all technical questions best left to economists and other experts; in other words, the issues raised by economic valuation are seldom solely 'economic'. *Second*, and especially in light of the non-technical considerations, the focus on 'judges versus experts' deemphasises judges' own unique expertise, that is, the expertise of judges *qua* judges, evidenced in the case law analysed in Chapters 3 to 6. *Third*, the

<sup>&</sup>lt;sup>70</sup> Brian R Binger, Robert F Copple and Elizabeth Hoffman, 'Use of Contingent Valuation Methodology in Natural Resource Damage Assessments: Legal Fact and Economic Fiction' (1994) 89 Northwestern University Law Review 1029, 1108.

<sup>&</sup>lt;sup>71</sup> Masur and Posner (n 69) 939. In the quoted passage the authors are outlining the argument for a low level of judicial review (where courts would approve any regulation as long as the agency provides *prima facie* plausible reasons for it). ibid 937. The authors themselves argue for a *high* level of review.

<sup>&</sup>lt;sup>72</sup> Reeve Bull and Jerry Ellig, 'Judicial Review of Regulatory Impact Analysis: Why Not the Best?' (2017) 69(4) Administrative Law Review 725, 810.

<sup>&</sup>lt;sup>73</sup> John C Coates IV, 'Cost-Benefit Analysis of Financial Regulation: Case Studies and Implications' (2015) 124 Yale Law Journal 882, 904.

adversarial framing of the judge-expert relationship risks ignoring its cooperative and complementary aspects which are no less important.

## 8.4 Non-technical questions

## 8.4.1 *Technical questions*

A considerable part of the exercise of environmental valuation is indeed highly technical. A good illustration is the damages claim and ensuing trial from the 1990 *American Trader* oil spill in the state of California.<sup>74</sup> To retrospectively estimate the lost recreational value resulting from beach closures, the plaintiff's economists had to, *inter alia*, compile and verify attendance data (i.e. how many people visited the beach per day), develop a statistical model (known as a vector-autoregressive model) to forecast attendance in the alternative scenario that the spill had not occurred, and select an estimate of consumers' surplus from the literature.<sup>75</sup> These are clearly technical exercises, which would be difficult if not impossible for a judge to competently perform.

More generally, as Bergkamp notes, accurate retrospective damage assessment typically involves establishing a resource's prior condition and the nature and extent of the damage, assessing equivalence, and other technical exercises which require 'significant fact-finding capability, a broad range of scientific expertise, and some level of public accountability'<sup>76</sup> – exercises which scientists and economists are better qualified to perform than judges.

Likewise, in prospective valuation cases, Farber persuasively argues that judicial review 'seems an unpromising way to improve the quality of an agency's *technical* 

<sup>&</sup>lt;sup>74</sup> People of the State of California ex rel. Department of Fish and Game v BP America, Inc. Orange County Superior Court Case Number 64 63 39 (1997).

<sup>&</sup>lt;sup>75</sup> David J Chapman and W Michael Hanemann, 'Environmental Damages in Court: The American Trader Case' in Anthony Heyes (ed), *The Law and Economics of the Environment* (Edward Elgar Publishing 2001).

<sup>&</sup>lt;sup>76</sup> Lucas Bergkamp, 'The Commission's White Paper on Environmental Liability: A Weak Case for an EC Strict Liability Regime (Part II)' (2000) 9(5) *European Energy and Environmental Law Review* 141, 144.

judgments',<sup>77</sup> and that 'relying heavily on judges to evaluate technical judgments makes little more sense than appointing engineers to review legal issues'.<sup>78</sup>

#### 8.4.2 Assumptions, values and context

While environmental valuation involves a fair share of technical issues, many other aspects, especially the more fundamental questions involved in making valuation choices, are not – or at least not solely – technical. Despite their apparent objectivity, economic valuation methods involve normative assumptions (for instance, the use of willingness-to-pay assumes that the strength of an individual's preference for a beneficial change is expressed in how much she is willing to pay for that change)<sup>79</sup> as well as value judgments (for instance, both revealed preference and stated preference methods are anthropocentric, assigning zero value to welfare gains and losses of non-human entities, except insofar as such gains and losses impact human welfare).<sup>80</sup> These normative assumptions and value judgments often remain implicit in the economic analysis,<sup>81</sup> and the choice of assumptions can have a significant effect on

<sup>&</sup>lt;sup>77</sup> Daniel A Farber, 'Revitalizing Regulation' (1993) 91(6) *Michigan Law Review* 1278, 1295 (emphasis added).

<sup>&</sup>lt;sup>78</sup> ibid.

<sup>&</sup>lt;sup>79</sup> John O'Neill and Clive L Spash, 'Conceptions of Value in Environmental Decision-Making' (2000) 9 Environmental Values 521, 522. For critical perspectives on the valueladen premises of economics in general, see Jonathan R Macey, 'The Pervasive Influence of Economic Analysis on Legal Decisionmaking' (1994) 17 Harvard Journal of Law & Public Policy 107, 115 (arguing that 'economic theory cannot supply the value judgments necessary to implement its own insights'); Saul Levmore, 'Judges and Economics: Normative, Positive, and Experimental Perspectives' (1997) 21 Harvard Journal of Law & Public Policy 129, 130 (arguing that '[m]uch of economics is built on questionable assumptions'). On environmental valuation in particular, see Mark Sagoff, Price, Principle, and the Environment (Cambridge University Press 2004); Frank Ackerman and Lisa Heinzerling, Priceless: On Knowing the Price of Everything and the Value of Nothing (The New Press 2004).

<sup>&</sup>lt;sup>80</sup> For a more detailed discussion of the anthropocentrism of valuation methods, see Chapter 2, Section 2.4.1.

<sup>&</sup>lt;sup>81</sup> The need to be upfront about analytical assumptions is occasionally recognised by economists themselves. See e.g. R David Simpson, 'Economic Analysis and Ecosystems: Some Concepts and Issues' (1998) 8 *Ecological Applications* 342, 342: 'Economists often base their analyses on a number of restrictive assumptions, and we are often remiss in not advising non-economist readers and listeners of this fact.'

the outcome of the valuation exercise. Where the valuation is an input into costbenefit analysis, the choice of assumptions may dictate the outcome of the analysis itself.<sup>82</sup>

Finally, the political and institutional context of the valuation can influence its outcome. Scott *et al* make this point in relation to cost-benefit analysis, but the insight applies to valuation more generally:

While BCAs [benefit-cost analyses] are often viewed as neutral informational input regarding costs and benefits of policy alternatives, and are ideally conducted by objective technicians ... in practice BCAs are highly contextual. That is, BCAs are generated out of and interpreted within a political, economic, or social context that influences both the counting of benefits and costs and the interpretation of methodology and results.<sup>83</sup>

#### 8.4.3 Legal questions

Valuation encompasses questions which run the gamut from technical (such as building statistical models) to philosophical (anthropocentrism, commensurability and so on). Along that spectrum, valuation choices also give rise to questions that are recognisably legal, relating to issues such as property rights, compensable losses and standing.

Consider a proposal to set up a factory whose operations would degrade the air quality of a nearby residential neighbourhood. If willingness-to-pay (the maximum amount the residents would be willing to pay to avoid the air pollution) is used as a

<sup>&</sup>lt;sup>82</sup> HS Burness and others, 'Practicably Irrigable Acreage and Economic Feasibility: The Role of Time, Ethics, and Discounting' (1983) 23 *Natural Resources Journal* 289, 301 ('Results from a benefit-cost study may be very sensitive to underlying assumptions.'); Farber (n 77) 1282 ('Except in extreme cases, the result of a cost-benefit analysis often turns on a series of discretionary judgments; competent, reasonable analysts can come up with quite different but equally defensible answers.')

<sup>&</sup>lt;sup>83</sup> Ryan P Scott, Tyler A Scott and Richard Zerbe, 'Bureaucratic Benefit-Cost Analysis and Policy Controversy' (2016) 7(2) *Journal of Benefit-Cost Analysis* 350, 351. Scott *et al* refer to this contextual cost-benefit analysis as 'Bureaucratic BCA' (ibid 351), and argue that it is 'generally much messier and more context dependent than the concept of ideal BCA would suggest' (ibid 363–64).

measure of loss of value to residents, it is implicitly assumed that the factory has property rights over clean air. In other words, it is assumed that the factory has a right to pollute, and the residents must purchase their right to clean air from the factory. On the other hand, using willingness-to-accept (the minimum amount the residents would be willing to accept to allow the air pollution) assumes that the residents have property rights (including the right to prevent the factory from polluting the air, and to demand payment from the factory in exchange for 'allowing' it to pollute). What seems like a technical choice between two methodologies for measuring loss of value turns out to be an implicit choice over property rights. The choice of measure is significant, because, as numerous experimental studies have shown,<sup>84</sup> the difference between willingness-to-pay and willingness-to-accept, especially for goods with low substitutability, can be very significant.

Likewise, in the *American Trader* case discussed in Section 8.4.1, it so happened that there was, to quote the plaintiff's economists, 'no disagreement ... regarding the appropriate economic methodology; all of the argument was about the empirical implementation of economic methodology'.<sup>85</sup> Thus the valuation methodology – in this case the travel cost method – was accepted by all parties, and the disputed issues related mainly to the collection, analysis and interpretation of data.<sup>86</sup> However, *if* the validity of the valuation methodology were disputed, as demonstrated by the cases analysed in Chapter 4, there would potentially be non-technical decisions (valuation choices) to be made. For instance, if the plaintiffs instead sought to use contingent valuation, the court would potentially have to decide what losses were compensable – that is, whether the defendants were liable for lost non-use values (as measured by contingent valuation), or for lost recreational value only (as measured by the travel cost method).

<sup>&</sup>lt;sup>84</sup> See e.g. W Michael Hanemann, 'Willingness to Pay and Willingness to Accept: How Much Can They Differ?' (1991) 81 American Economic Review 635.

<sup>&</sup>lt;sup>85</sup> Chapman and Hanemann (n 75).

<sup>&</sup>lt;sup>86</sup> ibid.

A third example of a non-technical legal issue is that of standing. For economists, standing is typically defined as 'the "right" to be included in the set of individuals whose changes in utility (however measured) are aggregated (in the set of individuals i = 1, ..., n)'.<sup>87</sup> However, economists have, perhaps wisely, tended to steer clear of the question of how to determine *which* individuals should have that right. A plausible explanation, proposed by Whittington and MacRae, is that:

[t]he issue of standing may ... have been neglected in the literature because economists felt they had little expertise that could be brought to bear on the question. Thus, following Mishan, they attempted to calculate the willingness to pay for 'each person in the defined community,' leaving the determination of the 'defined community' to the political process.<sup>88</sup>

Issues of standing, that is, determining the relevant set of individuals whose changes in utility should count,<sup>89</sup> are key to both prospective valuation (e.g. whose welfare

<sup>&</sup>lt;sup>87</sup> Dale Whittington and Duncan MacRae, Jr, 'The Issue of Standing in Cost-Benefit Analysis' (1986) 5(4) *Journal of Policy Analysis and Management* 665, 669. The economist's definition of standing may overlap with, but is not necessarily identical to, legal standing, that is, 'the right to bring an action or challenge some decision'. Jonathan Law, *A Dictionary of Law* (9th ed, Oxford University Press 2018). On the 'fundamental culture clash' between modern economic and historical legal concepts of standing, see Carol Adair Jones, 'Use of Non-Market Valuation Methods in the Courtroom: Recent Affirmative Precedents in Natural Resource Damage Assessments' (1997) 109 *Water Resources Update* 10.

<sup>&</sup>lt;sup>88</sup> Whittington and MacRae (n 87) 667, citing Ezra J Mishan, *Introduction to Normative Economics* (Oxford University Press 1981).

<sup>&</sup>lt;sup>89</sup> Trumbull refers to this as defining the relevant 'welfare space'. William N Trumbull, 'Who Has Standing in Cost-Benefit Analysis?' (1990) 9(2) *Journal of Public Policy Analysis and Management* 201, 202.

should count in a cost-benefit analysis)<sup>90</sup> and retrospective valuation (e.g. determining whose losses from natural resource injuries are compensable).<sup>91</sup>

Johnson *et al* suggest that it is relatively easy to identify the population which derives *direct use* value from an environmental resource or amenity, but that defining the relevant population which derives *non-use* value is much more controversial.<sup>92</sup> In fact, while *identifying* the population which derives direct use value may be relatively straightforward, questions of standing – whether their welfare gains or losses should be counted as a matter of law – still remain. These include not only territorial standing (for instance, whether only the residents of a particular state should count) but also political standing (whether non-citizens should count). In case of non-use value, questions of standing may be even more abstruse, including temporal standing (whether future generations should count), epistemological standing (whether individuals can have standing even though they had no knowledge of the improvement or damage) and even ontological standing (whether non-human entities should count).<sup>93</sup> Economists themselves recognise that '[u]ltimately the

<sup>&</sup>lt;sup>90</sup> For a legal perspective on this debate in the context of environmental cost-benefit analysis, see Ted Gayer and W Kip Viscusi, 'Determining the Proper Scope of Climate Change Policy Benefits in U.S. Regulatory Analyses: Domestic versus Global Approaches' (2016) 20(2) *Review of Environmental Economics and Policy* 245. For an economic perspective, see Whittington and MacRae (n 87); Trumbull (n 89); Dale Whittington and Duncan MacRae, Jr, 'Comment: Judgments about Who Has Standing in Cost-Benefit Analysis' (1990) 9(4) *Journal of Public Policy Analysis and Management* 536; Richard O Zerbe, Jr, 'Does Benefit-Cost Analysis Stand Alone? Rights and Standing' (1991) 10(1) *Journal of Public Policy and Management* 96.

<sup>&</sup>lt;sup>91</sup> See e.g. Richard W Dunford, F Reed Johnson and Emily S West, 'Whose Losses Count in Natural Resource Damages?' (1997) 15(4) *Contemporary Economic Policy* 77; Alan Randall, 'Whose Losses Count? Examining Some Claims about Aggregation Rules for Natural Resources Damages' (1997) 15(4) *Contemporary Economic Policy* 88.

<sup>&</sup>lt;sup>92</sup> F Reed Johnson and others, 'Role of Knowledge in Assessing Nonuse Values for Natural Resource Damages' (2001) 32(1) *Growth and Change* 43, 44.

<sup>&</sup>lt;sup>93</sup> The classic exposition of this idea is Christopher D Stone, 'Should Trees Have Standing? – Toward Legal Rights for Natural Objects' (1972) 45 *Southern California Law Review* 450. For more recent developments, see Abigail Hutchison, 'The Whanganui River as a Legal Person' (2014) 39(3) *Alternative Law Journal* 179.

questions involved cannot be resolved on technical grounds, but depend on the analyst's claims to express the ethical consensus of a society'.<sup>94</sup>

## 8.5 Judges as experts

## 8.5.1 *Defining expertise*

Oldfather rightly cautions against 'employ[ing] the terms 'expert' and 'expertise' as though their meanings are self-evident';<sup>95</sup> for the purposes of this discussion, I adopt a broad definition of expert as 'a person who has, or is deemed or claimed to have, extensive skill or knowledge in a particular field and who is part of a wider group consisting of persons holding similar expertise'.<sup>96</sup>

Ambrus *et al*'s definition of 'expert' quoted above emphasises skill or knowledge *in a particular field*; likewise, for Oldfather, expertise is 'domain-specific'.<sup>97</sup> In Section 8.4, I argued that environmental valuation involves not only technical, but also non-technical and specifically legal questions. Environmental valuation thus calls for expertise in various domains, including in the field of interpreting statues and precedent, given that, in a wide range of scenarios, statutes or precedent dictate, or at least provide guidance on, how valuation choices are to be made.

<sup>&</sup>lt;sup>94</sup> Whittington and MacRae (n 87) 666.

<sup>&</sup>lt;sup>95</sup> Chad M Oldfather, 'Judging, Expertise, and the Rule of Law' (2012) 89 *Washington University Law Review* 847, 852–53.

<sup>&</sup>lt;sup>96</sup> Monika Ambrus and others, 'The Role of "Experts" in International and European Decision-Making Processes: Setting the Scene' in Monika Ambrus and others (eds), *The Role of "Experts" in International and European Decision-Making Processes: Advisors, Decision Makers or Irrelevant Actors?* (Cambridge University Press 2014) 12. Oldfather identifies two approaches to defining 'expertise': a *relative approach*, according to which 'an expert is simply someone who knows more about the topic at hand, and expertise is a relative rather than an absolute characteristic', and a *qualitative approach* which regards expertise as 'involving the crossing of a qualitative threshold'. Oldfather (n 95) 879.

<sup>&</sup>lt;sup>97</sup> Oldfather (n 95) 880.

#### 8.5.2 *Judicial expertise*

#### (a) Expertise in statutory interpretation

In environmental valuation cases, the exercise of valuation is not performed in a vacuum, but in the context of a specific framework of applicable statutes, rules, regulations and precedent. There is a long tradition of scholarship, and much debate, about the role of a common-law judge,<sup>98</sup> but one aspect of the role that is universally accepted is the duty to interpret and apply the law. Interpretation of statutes and precedent is seen as a key element, perhaps *the* key element, of the judicial function. As Judge Easterbrook expressed it: 'Judges interpret words.'<sup>99</sup> Thus, to the extent that statutes, precedents or the general legal principles applicable to a given case dictate, or indicate, how some of the valuation choices should be made (for instance, whether certain values should be included in the calculus), those choices fall within the realm of expertise, and also the functional remit, of the common-law judge.

Judges have an obligation to apply valid law in making rulings, and to do other things necessary to the proper discharge of that duty. For example, they have a duty to make correct findings of fact, to know what the law is, to keep their knowledge of the law up to date, to rule intelligibly so that those to whom the ruling applies know what to do, and so on.

<sup>Perhaps the most prominent debate, outside the scope of this chapter, relates to whether judges declare law or make law. See e.g. Zechariah Chafee, Jr, 'Do Judges Make or Discover Law?' (1947) 91(5)</sup> *Proceedings of the American Philosophical Society* 405; Jack G Day, 'Why Judges Must Make Law' (1975) 26 *Case Western Reserve Law Review* 563; William S. Brewbaker III, 'Found Law, Made Law and Creation: Reconsidering Blackstone's Declaratory Theory' (2007) 22(1) *Journal of Law and Religion* 255. See however, ('the proper judicial role in a democracy is not readily reducible to a formula').

<sup>&</sup>lt;sup>99</sup> Frank H Easterbrook, 'Legal Interpretation and the Power of the Judiciary' (1984) 7 *Harvard Journal of Law and Public Policy* 87, 87. Fiss puts the point even more strongly: 'Adjudication is interpretation'. Owen M Fiss, 'Objectivity and Interpretation' (1982) 34(4) *Stanford Law Review* 739, 739. Leslie Green includes 'law-applying obligations' as one of the three elements of the judicial role (the other two being law-improving and law-protecting obligations), and of course, application inevitably requires some level of interpretation:

Leslie Green, 'Law and the Role of a Judge' in Kimberly Kessler Ferzan and Stephen J Morse (eds), *Legal, Moral, and Metaphysical Truths: The Philosophy of Michael S. Moore* (Oxford University Press 2016) 334.

#### (b) Judicial-process expertise

Some scholars have suggested that besides their avowed expertise in statutory interpretation, judges have a more general, 'trans-substantive' expertise in deploying the tools of legal analysis.<sup>100</sup> Judicial expertise, on this view, 'pertains to the process of judging itself, such that what is implicated, by its nature, is some relatively general skill'.<sup>101</sup> This process-oriented view of expertise is shared by Friendly, for whom '[t]he process is more important than the subject matter; and the judge can lay claim to being a specialist in that.'<sup>102</sup> In an article on the debate between generalist versus specialised courts (but which is nevertheless relevant to judicial expertise in general), Posner makes the point most succinctly: 'Our judges are specialized – to judging.'<sup>103</sup>

## (c) 'Generalist' expertise

In light of the earlier definition of an expert as someone with extensive skill or knowledge in a *particular* field, the notion of 'generalist expertise' may seem oxymoronic, but it is possible, even likely, that a generalist would have a perspective that a specialist lacks; the perspective, to use Isaiah Berlin's famous distinction, of the fox rather than the hedgehog.<sup>104</sup>

<sup>&</sup>lt;sup>100</sup> Oldfather (n 95) 896. Oldfather explains that by trans-substantive, 'I mean simply that it would apply to the act of judging regardless of variation in subject matter, size, or other aspect of the case.' ibid fn 17.

<sup>&</sup>lt;sup>101</sup> ibid 853, citing Richard A Posner, *The Federal Courts: Challenge and Reform* (Harvard University Press 1996) 248: 'the judge will have a skill at judging that comes from long practice in evaluating arguments of counsel, decisions of trial judges, and trial records'.

<sup>&</sup>lt;sup>102</sup> Henry J Friendly, 'Reactions of a Lawyer – Newly Become Judge' (1961) 71 Yale Law Journal 218, 222. See also Oldfather (n 95) 863 ('The idea here is that the relevant expertise exists with respect to law and legal analysis in a broad sense'.)

<sup>&</sup>lt;sup>103</sup> Richard A Posner, 'Will the Federal Courts of Appeals Survive until 1984?: An Essay on Delegation and Specialization of the Judicial Function' (1983) 56 Southern California Law Review 761, 778.

<sup>&</sup>lt;sup>104</sup> 'There is a line among the fragments of the Greek poet Archilochus which says: "The fox knows many things, but the hedgehog knows one big thing."' Berlin goes on to argue that writers and thinkers, and perhaps human beings in general, fall into two categories. Hedgehogs – Berlin's examples include Plato, Dostoevsky and Proust – think, feel and understand the world in relation to a single, all-embracing system. Foxes on the other hand – such as Shakespeare, Aristotle, Joyce – pursue multiple, often unrelated and even

Thus, Rifkind emphasises that 'the judicial process requires a different kind of expertise – the unique capacity to see things in their context',<sup>105</sup> while for Cardozo, judges have:

an outlook on life, a conception of social needs, a sense in [William] James's phrase of 'the total push and pressure of the cosmos,' which, when reasons are nicely balanced, must determine where choice shall fall.<sup>106</sup>

The generalist *perspective* ('generalist expertise' is perhaps contentious) is particularly valuable when it comes to interpreting statutes whose purposes are hard to discern. As McConnell notes:

in difficult, controversial cases ... there is generally no consensus regarding statutory purpose. ... Indeed, when a case goes to court, this is generally an indication that different interests in society favor different understandings of purpose. It is not often true that only one of these understandings is reasonable.<sup>107</sup>

In this background, Oldfather has argued that '[i]f one accepts the proposition that law – perhaps especially statutory law – reflects a variety of competing and often conflicting aims, then the generalist stands as more likely to be sensitive to and take account of these divergent ends'.<sup>108</sup>

#### 8.5.3 Limitations

So far, I have argued that environmental valuation cases involve not only technical, but also non-technical and specifically legal questions, and that while most judges

contradictory ends. Isaiah Berlin, *The Hedgehog and the Fox: An Essay on Tolstoy's View of History* (2nd edn, Princeton University Press 2013) 1.

<sup>&</sup>lt;sup>105</sup> Simon Rifkind 'A Specialized Court for Patent Litigation? The Danger of a Specialized Judiciary' (1951) 37 American Bar Association Journal 425, 425 ('Against the citadel of the expert, I tilt no quixotic lance. My contention is that the judicial process requires a different kind of expertise – the unique capacity to see things in their context.')

<sup>&</sup>lt;sup>106</sup> Benjamin N Cardozo, *The Nature of the Judicial Process* (Yale University Press 1921) 12.

<sup>&</sup>lt;sup>107</sup> Michael W McConnell, 'Active Liberty: A Progressive Alternative to Textualism and Originalism?' (2006) 119 Harvard Law Review 2387, 2405

<sup>&</sup>lt;sup>108</sup> Oldfather (n 95) 864.

lack the economic expertise necessary to address the technical issues, their expertise as judges, in principle, equips them to identify and address the non-technical and specifically legal issues.

The principal objection to this view is that most judges are not trained economists,<sup>109</sup> and it can be difficult to separate the technical from the non-technical or legal issues involved in environmental valuation. Judges who make decisions in this area may thus be assuming 'a responsibility that they are not adequately equipped to perform, leading to increased uncertainty and deterioration in the quality of ... decisionmaking'.<sup>110</sup>

Alternatively, there is a risk of judges erring in the other direction by failing to appreciate the non-technical or legal issues; the underlying assumptions and value judgments may be obscured by the language of economic analysis. As Lee writes in the context of environmental decision-making, '[l]ooking behind economic calculations to the value judgements implicit in them is extremely difficult.'<sup>111</sup> It would be a demanding and time-consuming undertaking for a judge to 'prob[e] the underlying assumptions and goals ... and then decide, in light of much debate and conflict, which assumptions she agrees with and which tools of economic analysis incorporate those assumptions but not the others'.<sup>112</sup>

The task is made harder by the fact that 'the language [of economics] itself can cloud, rather than clarify the legal issues'.<sup>113</sup> This is not only due to 'the sometimes incomprehensible language of economics',<sup>114</sup> but also its apparent neutrality and objectivity. As McCloskey famously argued, mainstream economics 'promises

<sup>&</sup>lt;sup>109</sup> Bull and Ellig (n 72) 810.

<sup>&</sup>lt;sup>110</sup> ibid.

<sup>&</sup>lt;sup>111</sup> Maria Lee, EU Environmental Law: Challenges, Change and Decision-Making (Hart Publishing 2005) 186.

<sup>&</sup>lt;sup>112</sup> Patricia M Wald, 'Limits on the Use of Economic Analysis in Judicial Decisionmaking' (1987) 50(4) *Law and Contemporary Problems* 225, 227. Wald is writing about the use of economic analysis in judicial decision-making more generally, but the point also applies to environmental valuation in particular.

<sup>&</sup>lt;sup>113</sup> ibid 236.

<sup>&</sup>lt;sup>114</sup> ibid 226.

knowledge free from doubt, metaphysics, morals, and personal conviction; what it delivers merely renames as Scientific Method the ... economic scientist's metaphysics, morals, and personal convictions'.<sup>115</sup>

#### 8.5.4 Mitigating factors

The limitations, stemming from judges' lack of economic expertise and the language and rhetoric of economics itself, are by no means inconsequential, but as the case studies in Chapters 3 to 6 have shown, judges have, for the most part, proved to be capable of identifying and engaging with the legal issues latent in environmental valuation. In this section, I propose two possible (and non-exclusive) explanations for this phenomenon.

The first explanation relates back to the point about judicial expertise. In a sense, environmental valuation, or economic questions in general, are not 'special'; judges routinely review expert evidence and factual findings 'from disciplines far more foreign to legal reasoning than economics',<sup>116</sup> and as Dwyer puts it, 'the fundamental structure of evidential reasoning is substance blind'.<sup>117</sup>

Second, judges have wisely tended to focus not on the technical aspects but on 'the premises of scientific opinion',<sup>118</sup> and a generalist judge is better equipped to make

<sup>&</sup>lt;sup>115</sup> Donald N McCloskey, 'The Rhetoric of Economics' (1983) 21(2) *Journal of Economic Literature* 481, 488. Also see Andrew Brennan, 'Moral Pluralism and the Environment' (1992) 1 *Environmental Values* 15, 15 ('In environmental discussions, the economist often takes the part of the sensible, rational being, the person who wants to be objective, and base judgments on solid fact. Yet the appeal to economic rationality is highly dangerous – some would say immoral.').

<sup>&</sup>lt;sup>116</sup> Bull and Ellig (n 110) 810.

<sup>&</sup>lt;sup>117</sup> Déirdre Dwyer, *The Judicial Assessment of Expert Evidence* (Cambridge University Press 2008) 6.

<sup>&</sup>lt;sup>118</sup> Marcello Gaboardi, 'How Judges Can Think: The Use of Expert's Knowledge as Proof in Civil Proceedings' (2018) 18(1) *Global Jurist* 1, 16, quoting David L Faigman and Claire Lesikar, 'Organized Common Sense: Some Lessons from Judge Jack Weinstein's Uncommonly Sensible Approach to Expert Evidence' (2014) 64(2) *DePaul Law Review* 421, 424.

decisions which 'require value choices rather than technical accuracy'.<sup>119</sup> A recurring theme in Chapters 3 to 6 is judges' concern to understand the legal, social and environmental consequences of valuation choices, and as Cecot and Livermore put it, 'it does not take a great deal of economic expertise to grasp the basic normative implications of economics for environmental law and policy'.<sup>120</sup> Indeed, the empirical finding echoes an observation made by Coase several decades ago – that 'judges in their opinions often seemed to show a better understanding of the economic problem than did many economists even though their views were not always expressed in a very explicit fashion.'<sup>121</sup>

A third mitigating factor, more fully explored in the following section, pertains directly to the relationship between judges and experts, specifically the cooperative and complementary aspects thereof.

#### 8.6 Expert assistance

An adversarial framing of the judge–expert relationship risks ignoring its cooperative and complementary aspects which are no less important. As the case studies discussed in Section 8.2 show, judges in valuation cases are often assisted by experts in the decision-making process. Direct involvement of experts (as opposed to the use of expert studies and reports) takes two forms: neutral experts who are called upon to assist the court, and expert witnesses employed by the parties to give testimony.

<sup>&</sup>lt;sup>119</sup> Edward K Cheng, 'The Myth of the Generalist Judge' (2008) 61 *Stanford Law Review* 519, 524 ('To be sure, expertise is not the be-all end-all of the ideal jurist, particularly when issues require value choices rather than technical accuracy').

<sup>&</sup>lt;sup>120</sup> Caroline Cecot and Michael A Livermore, 'Economics and Environmental Law Scholarship' in Ole W Pedersen (ed), *Perspectives on Environmental Law Scholarship: Essays on Purpose, Shape and Direction* (Cambridge University Press 2018) 109. See also Robert H Bork, 'The Role of the Courts in Applying Economics' (1985) 54 *Antitrust Law Journal* 21, 22 ('microeconomics is a field in which the simple ideas are the most powerful ideas').

 <sup>&</sup>lt;sup>121</sup> R H Coase, 'Law and Economics at Chicago' (1993) 36 *Journal of Law and Economics* 239, 250, citing RH Coase, 'The Problem of Social Cost' (1960) 3 *Journal of Law and Economics* 1. Coase adds, 'I did this not to praise the judges but to shame economists.' ibid.

Gaboardi suggests that the former is more characteristic of civil law systems and the latter of common law systems,<sup>122</sup> but as discussed in Section 8.2.1 above, Indian courts also routinely appoint neutral experts in environmental valuation cases, and US law also contains provisions to do the same. For Gaboardi:

an appointed expert seems to be more reliable than an expert witness. The reason is simple: an appointed expert is characterized as *supporting* the judge with scientific knowledge. Such a reliability depends on the fact that the appointed expert has the *same purpose* of the judge. ... In this way, the expert's conclusions affect the finding of facts without seeking to impose the preferences of the parties.<sup>123</sup>

The 'single independent and balanced opinion of an appointed expert'<sup>124</sup> may thus appear more trustworthy than the 'partisanship and pecuniary subserviency of an expert witness called by a party'.<sup>125</sup>

However, this view may be simultaneously underestimating both the reliability of expert witnesses and the expertise of judges in evaluating conflicting testimony. Experts do indeed have some incentives to align their testimony with the client's interest, but as Solow and Fletcher argue, this also comes with risks – 'the prospects of having to defend a dubious position under cross-examination and ... damage to one's professional reputation'.<sup>126</sup> Moreover, disagreement is not necessarily an indicator of malpractice: the outcome of valuation is a function of valuation choices,

<sup>&</sup>lt;sup>122</sup> Gaboardi (n 118) 1: 'For civil lawyers the expert needs to be appointed depending on judicial discretion. ... On the contrary, the common law tradition leaves the attorneys with a burden of submitting to the court the technical or scientific knowledge they deem necessary for the judgment. In this different perspective, the judge is basically called upon to evaluate the expert witnesses and select their convincing statements through the cross-examination of the parties.'

<sup>&</sup>lt;sup>123</sup> ibid 13.

<sup>&</sup>lt;sup>124</sup> ibid.

 <sup>&</sup>lt;sup>125</sup> Harold Leventhal, 'Environmental Decisionmaking and the Role of the Courts' (1974) 122
University of Pennsylvania Law Review 509,547

<sup>&</sup>lt;sup>126</sup> John L Solow and Daniel Fletcher, 'Doing Good Economics in the Courtroom: Thoughts on *Daubert* and Expert Testimony in Antitrust' (2005) 31 *Journal of Corporation Law* 489, 490.

and not an objective fact.<sup>127</sup> Likewise for Dwyer, 'disagreement between experts is to be expected', and it would be unreasonable to expect 'a "single right answer" from experts in most if not all cases'.<sup>128</sup>

Secondly, Gaboardi may be overestimating the difficulty of evaluating conflicting testimony and underestimating judicial expertise. As Masur and Posner have pointed out in the context of judicial review of agency regulation (the focus of Chapter 3 of this thesis):

courts deal with expert studies in private litigation all the time. Because both sides typically submit expert reports with different conclusions, the court must evaluate both of them, even though the reports may involve statistical scientific, and other technical reasoning. It cannot "defer" to two inconsistent reports. In the case of judicial review of agency regulation, courts should draw on the same skills that they use in private litigation.<sup>129</sup>

## 8.7 Conclusion

Environmental valuation cases inevitably raise questions around the role of judges vis-à-vis that of other experts. In light of the highly technical nature of environmental valuation, one might query whether experts, rather than generalist judges, are better equipped to decide whether (and if so, how) valuation should be carried out.

Certain technical questions around valuation do indeed fall within the realm of experts, but the adversarial judges-versus-experts framing downplays three key facets of environmental valuation in the courtroom and the role of judges therein.

<sup>&</sup>lt;sup>127</sup> ibid 497:

<sup>&#</sup>x27;[E]conomists testifying on opposite sides in court will typically disagree. It does not follow that one of them is engaging in academic misconduct. Different experts will find different pieces of evidence persuasive. Different sources of data can point to alternative conclusions, and applying different statistical techniques to the same body of data can give rise to different inferences.'

<sup>&</sup>lt;sup>128</sup> Dwyer (n 117) 6.

<sup>&</sup>lt;sup>129</sup> Masur and Posner (n 69) 951. See also Dwyer (n 117) 6, arguing that 'the court's epistemic competence to assess expert evidence' can at least partially be justified on the basis that 'the fundamental structure of evidential reasoning is substance blind'.

*First,* the questions arising from environmental valuation are not all technical questions best left to economists and other experts. *Second,* 'judges versus experts' deemphasises judges' own unique expertise, that is, the expertise of judges *qua* judges. *Third,* the adversarial framing of the judge–expert relationship risks ignoring its cooperative and complementary aspects which are no less important.

# Chapter 9 Conclusion

Lawrence Friedman once wrote that '[o]ne function of courts in our society is to answer unanswerable questions'.<sup>1</sup> Putting a monetary value on salmon populations, or clean air, may seem similarly unanswerable, but economists have responded to the challenge, and in legal cases involving environmental valuation, often judges must, too.

This thesis is about how such decisions are made. I started out studying environmental valuation in the courtroom because it unifies two of my research interests: the judicial decision-making process, and the use (and occasionally, abuse) of economic theory in pursuit of environmental goals. I was interested in environmental valuation also because it crops up in a multitude of jurisdictions and legal systems, each with their own unique social, economic, political and legal context, and in a variety of cases – cost-benefit analysis, prospective valuation of forest land and quantification of damages, to include only the cases investigated in this thesis – which have traditionally been treated as separate spheres of enquiry.

In the course of compiling, reading and analysing these cases, I began to glimpse at one reason why. A substantial sample of case law, spanning diverse jurisdictions and areas of law, calls out for a unifying analytical framework. Otherwise, the analysis becomes too intractable, unmanageable. Perhaps recklessly, I had not embarked on my research with any such framework in mind; instead, it gradually emerged out of my reading, writing and thinking, not to mention supervisory meetings, conferences and academic discussions.

<sup>&</sup>lt;sup>1</sup> Lawrence M Friedman, 'The Day Before Trials Vanished' (2004) 1 *Journal of Empirical Legal Studies* 689, 698: 'a jury decides, for example, that a broken leg is worth \$50,000 in pain and suffering. These are, in Weberian terms, irrational decisions. They cannot be reduced to a formula, a proposition, an algorithm. And in each case no "rational" decision is possible, at least not a "rational" decision in the sense that it can be predicted or accounted for logically or deducted from legal principles.'

The analytical framework I use is twofold. Judicial decision-making aspires to be, and generally is, logical, so it is not surprising that environmental valuation decisions exhibit an underlying logic – a step-by-step approach which I characterised as the three-stage framework of valuation choices. Interestingly, economists themselves often seem unaware of the complex, value-laden and contested nature of the valuation process; to dwell on technical questions of quantification before addressing which values are to be measured (or even whether valuation is even appropriate) is to put the methodological cart before the definitional horse. As Coase noted, 'judges in their opinions often seemed to show a better understanding of the economic problem than did many economists even though their views were not always expressed in a very explicit fashion.'<sup>2</sup> The systematic application of the valuation choices framework, as I have tried to demonstrate in the foregoing chapters, enables us to identify these choices and make them explicit, even if courts make those choices implicitly or even subconsciously.

My second integrating theme, the concept of context-driven valuation, emphasises the fact that the exercise of valuation is not performed in a vacuum, but in a social, economic and political context. The economist may have special expertise in the technical calculus of valuation, but as Oldfather notes, law reflects 'a variety of competing and often conflicting aims', and 'the generalist stands as more likely to be sensitive to and take account of these divergent ends'.<sup>3</sup> Moreover, in the judicial context, valuation is embedded in a specific framework of applicable statutes, rules, regulations and precedent – a field in which judges *are* the experts.

For each case study, and for each body of case law which I examined, the use of valuation choices as an analytical framework enabled me to form categories, see connections and identify trends which I, and many commentators, had hitherto missed – it served as organising principle, enabling me not only to differentiate, for

R H Coase, 'Law and Economics at Chicago' (1993) 36 *Journal of Law and Economics* 239, 250, citing RH Coase, 'The Problem of Social Cost' (1960) 3 *Journal of Law and Economics* 1.

<sup>&</sup>lt;sup>3</sup> Chad M Oldfather, 'Judging, Expertise, and the Rule of Law' (2012) 89 *Washington University Law Review* 847, 864.

example, between scope and methodology challenges to judicial review of costbenefit analysis by US regulatory agencies (Chapter 3) or between general and specific challenges (Chapter 4), but also to explain apparent contradictions in judicial decision-making. Likewise, the concept of context-driven valuation can serve an explanatory function – if valuation choices are made in light of context, it is no surprise that different contexts can yield different valuation choices. It can also be used for normative assessments of court decisions, as demonstrated by the analysis, in Chapter 5, of how the Indian Supreme Court's eventual valuation choices in the *Godavarman* case and their social, economic and environmental impact contravened some of the abstract principles enunciated by the court itself.

To keep the investigation manageable, I have limited myself to two jurisdictions, and to specific bodies of case law *within* those jurisdictions. Needless to say, this is not an exhaustive sample of cases involving valuation, not even of cases involving *environmental* valuation (for example, in Chapter 4, on retrospective valuation in the US, I included on damage assessment cases involving contingent valuation, omitting other methods such as travel cost and habitat equivalency, and in Chapter 5, I limited myself to prospective valuation of forest land in India, ignoring case law on costbenefit analysis of coastal areas and other environmental amenities). However, the analytical framework I used can, in principle, be productively employed not only for these other categories of cases, but also for other forms of (non-environmental) valuation, as well as to other jurisdictions.

Aside from using the concept of context-driven valuation to evaluate judicial decision-making as noted above, I also refrained from normative analysis. In particular, I did not take a position on the desirability of the use of economic theory and methods for environmental protection. There is, however, a lively debate and an extremely rich literature on this subject, some of which I alluded to at various points in this thesis, including Sections 2.4 (Philosophical questions) and 3.3 (the CBA controversy).

To summarise, in Chapter 1, I characterised valuation as a three-stage process, involving what I call valuation choices: whether to value or not to value, what values

to measure and how to measure them. I also introduced the concept of valuation choices, which, along with valuation choices, is one of the two integrating themes of this thesis. In Chapter 2, I set out the basic economic-theoretical framework of environmental valuation, using the second and third valuation choices (categories of value and methods of valuation) as an organising principle.

In Chapters 3 to 6, I presented four case studies, focusing on prospective and retrospective valuation in the United States and India. These chapters focus on specific categories of cases (regulatory cost-benefit analysis ('CBA'), contingent valuation ('CV') of environmental damage, forest valuation and damage quantification under the Polluter Pays Principle) where environmental valuation was implicated. The identification and selection of the cases itself constitutes an empirical contribution in that the scholarly debate on these issues has often tended to cluster around either specific 'landmark' cases or abstract normative questions such as 'Should CV be admissible in courts?' or 'What is the appropriate standard of judicial review of agency CBA?' The case studies, on the other hand, reveal what courts are doing in practice, and contribute to the literature in four different fields.

In Chapter 3, I identified and analysed US appellate court challenges (1981–2018) to an agency CBAs involving environmental valuation. Using the valuation choices framework, I classified the cases into 'scope' and 'methodology' challenges, revealing that the former is significantly more likely to succeed than the latter, and analysing the reasons therefor.

In Chapter 4, I identified and analysed US cases (1981–2018) involving the use of CV of environmental damage. I classified them into cases involving the use of CV for natural resource damage assessment, and those involving the use of the method to measure environmental damage which caused an alleged diminution of private property value. I identified a trend whereby every general challenge against the use of CV has ended in failure, while every specific challenge which went to merits has all been successful. I showed how courts arrived at these outcomes, and analysed this apparent contradiction.

Chapter 5, the first of two focusing on Indian case law, studied the *Godavarman* case which is technically one single 'omnibus case', but in fact is ongoing since 1995, involving several hundred orders by the Supreme Court. I identified the specific orders which relate to prospective valuation of forest land, revealing the legal and philosophical principles of valuation enunciated by the court over two decades, the implementation and impact of net present value which was adopted in practice, as well as certain inconsistencies between the two.

In the last of the case studies, Chapter 6, I studied the retrospective valuation of environmental damage under the Polluter Pays Principle, showing how Indian courts have resolved questions of scope and methodology.

Besides the use of valuation choices as an analytical framework, a recurring theme in the case studies was the idea that the issues raised by environmental valuation are seldom solely 'economic', and as a corollary, the primacy of context. In Chapter 7 I synthesised these ideas, showing that in a range of cases seldom studied together, courts have implicitly or explicitly been making valuation choices, and furthermore, that those choices have been context-driven, that is, impelled by, or justified in light of, context.

At the same time, environmental valuation does have important technical aspects which lie outside the expertise of most judges and lawyers, and which fall within the domain of economic or scientific experts. Therefore, in Chapter 8, I analysed the role of experts in valuation cases, identifying the different ways in which experts have been involved, and emphasising not just the adversarial, but also the cooperative and complementary aspects of the judge–expert relationship. Finally, drawing on the case studies as well as literature on the judicial role, I argued for a recognition of judges' own unique expertise at making context-driven valuation choices.

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