



Essential Readings in Environmental Law
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THE PRECAUTIONARY PRINCIPLE IN ENVIRONMENTAL LAW

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OVERVIEW OF KEY SCHOLARSHIPS

General introduction and background to the Precautionary Principle

1. Cameron, J., and J. Abouchar, "The precautionary principle: A fundamental principle of law and policy for the protection of the global environment", (1991) 14:1 *Boston College International Comparative Law Review*, 1–27
2. Raffensperger, C. and J. Tickner, (eds) *Protecting Public Health and the Environment: Implementing the Precautionary Principle*, (Washington DC: Island Press, 1999)
3. Gee D., P. Harremoes, J. Keys, M. MacGarvin, A. Stirling, S. Vaz, and B. Wynne, *Late Lesson from Early Warnings: The Precautionary Principle 1898–2000*, (Copenhagen: European Environment Agency, 2001)
4. Gee D., P. Grandjean, S. F. Hansen, S. Van den Hove, M. MacGarvin, J. Martin, G. Nielsen, D. Quist, and D. Stanners, (eds) *Late lessons from early warnings: science, precaution, innovation*, (Copenhagen: European Environment Agency, 2013)
5. World Commission on the Ethics of Scientific Knowledge and Technology (COMEST), *The Precautionary Principle*, (UNESCO, 2005)
6. Harding, R., C. Hendriks, and M. Faruqi, *Environmental Decision-Making: Exploring Complexity and Context*, (Sydney: Federation Press, 2009)

Implementation

7. Peel, J., *The precautionary principle in practice: Environmental decision-making and scientific uncertainty*, (Sydney: Federation Press, 2005)
8. Fisher, E., J. Jones, and R. Von Schomberg, (eds), *Implementing the Precautionary Principle: Perspectives and Prospects*, (Cheltenham: Edward Elgar Publishing, 2006)
9. De Sadeleer, N., *Implementing the Precautionary Principle: Approaches from the Nordic Countries, EU and USA*, (Taylor & Francis, 2007)

The debate

10. Morris, J., (ed), *Rethinking Risk and the Precautionary Principle*, (Oxford: Butterworth-Heinemann, 2000)

11. Sunstein, R. C., *Laws of Fear: Beyond the Precautionary Principle*, (New York: Cambridge University Press, 2005)
12. Stirling, A., “Risk, precaution and science: towards a more constructive policy debate. Talking point on the precautionary principle”, (2007), 8 EMBO Reports, 309 - 315

Background

The Precautionary Principle is a fundamental component of the concept of ecologically sustainable development. One of the most common definitions of the precautionary principle can be found in article 15 of the 1992 *Rio Declaration on Environment and Development*, which states that: “In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.” Whilst this can be seen as a starting point there is still great debate in relation to the precautionary principle: how it is to be defined (particularly taking into account the significant differences between the ‘strong’ and ‘weak’ versions of the principle) and when or if it should be used.

There are diverse formulations, analyses, applications, controversies and implications of the principle relevant to all areas including the conservation of the environment. The principle invokes discussion on philosophy, ethics, law, economics, public policy, technology, risk analysis, toxicology, and public health. The principle has been frequently recommended for and /or used to justify the regulation of human activities ranging from biotechnology, pollution, radiation exposure, food safety, medical technologies, occupational hazards and public health concerns. There is an abundance of literature on the precautionary principle, and whilst it is enshrined in treaties, national framework legislations, directives and regulations it is still the subject of controversy.

General introduction and background to The Precautionary Principle

Whilst there are numerous text and articles relating to the principle that can provide a good starting point the selected references provide important examples of the genre.

1. **J. Cameron** and **J. Abouchar’s** article titled, *The precautionary principle: A fundamental principle of law and policy for the protection of the global environment*, represents one of the early assessments of the relevance of the principle in environmental law. The article commences by reviewing the use of the principle to date then posits that the principle is emerging as a customary norm of international law. Thereafter the authors present a model legislative and administrative framework and operation of the principle. In the process the authors provide a very significant early survey of the principle as an emerging principle of law and a springboard for the ensuing debate and literature. They demonstrate support for the principle as a guiding principle to encourage decision makers

to consider the likely harmful effects of activities on the environment. Based on the trends of the time, the authors optimistically conclude that the principle had the potential to be used as a ‘comprehensive guide for environmental protection policy’. This is a valuable article as it reminds us of the origin of the debate and is a resource to reflect upon to track the progress (or otherwise) of the principle in environmental regulation.

2. The collective essays in the book, *Protecting Public Health and the Environment: Implementing the Precautionary Principle*, **C. Raffensperger** and **J. Tickner** also provides early overview of the history, foundations, theory, and implementation of the precautionary principle expanding upon the papers presented at the seminal 1998 Wingspread Conference on the Precautionary Principle. Part of the significance of the volume rests in the subsequent prominence of Wingspread in the precaution debate and the quality of the contributors including **Robert Costanza, David Gee, Ken Geiser, Andrew Jordan, Edward Loechler, Marco Martuzzi, Timothy O’Riordan, David Ozonoff, Carolyn Raffensperger, Ted Schettler, and Joel Tickner**. Throughout, contributors focus on the difficult questions of implementation and the fundamental change required to support a more precautionary approach to environmental and public health hazards covering activities ranging from agriculture to manufacturing. There is explanation as to how to identify when precautionary action is required and who should decide, along with specific structures and mechanisms for implementing the principle. In particular there is thoughtful consideration of the oft vexing issue of shifting the burden of proof whereby once the application of the precautionary principle is triggered the burden of proof would then shift to the proponent to prove that serious or irreversible environmental damage would not be sustained. This text is enlightening and thought provoking.
3. To gain an understating of role of precaution in the decision process one cannot go past the thought provoking and perhaps controversial volume by **D. Gee et al.** titled, *Late Lesson from Early Warnings: The Precautionary Principle 1898-2000*. The first of two volumes, it represented a refreshing move away from the increasingly rhetorical arguments surrounding the principle. This was a provocative text at the time and not without its critics. The reflection at least put the world on notice. This volume takes a close look at practical examples of the problem of decision making in the face of scientific uncertainty and risk. It provides a retrospective examination of 14 major, high profile and avoidable public disasters relating to environmental and public health problems from mid nineteenth century to current time (the reader will recognise many, if not all, of the examples) and an attempt to draw lessons and establish criteria that could help to minimise the health and environmental risks of future technological, economic and policy innovations. The authors of the case studies had to address 4 key questions: when was the first credible ‘early warning’; what actions were taken for risk reduction;

what was the cost and benefit of action or inaction; what were the lessons to be learnt to guide future decision makers? Understandably the quality of the case studies vary but the reader is provided with a fine overview of the problems faced by regulators when dealing with risk and scientific uncertainty. Volume 1 concludes with the identification of “Twelve Key Lessons”. A significant contribution of the text is the powerful elucidation of the complex nature of the regulatory decision making in a precautionary environment where issues are often caught up in a tangled web of social, politic, economic, philosophical and scientific concerns.

4. In Volume 2, *Late lessons from early warnings: science, precaution, innovation*, **D. Gee et al.** build on the original theme and expand on the late lessons approach, filling in some gaps, addressing new challenges and providing new insights 12 years on from the original Late Lessons. One gap in particular was addressed through analysing the issue of false positives where government regulation was undertaken based on precaution but later turned out to be unnecessary.
5. The report titled, *The Precautionary Principle*, prepared by the **World Commission on the Ethics of Scientific Knowledge and Technology**, is a valuable entry point for scholars and practitioner alike, the writing is precise and uncontroversial but sets out many of the key issues succinctly and in an orderly manner. It does not pretend to be a sophisticated analysis but rather has modest aims ‘...provides Member States with a solid base for discussion and clarifies the principle in a pragmatic way’. This was to be achieved by reducing the gaps in the understanding of the principle for decision makers and scientists and thereby enable a more informed debate. Significantly the expert group members represented an eminent cross section of expertise: **Sharon Beder, Vittorio Hosle, Matthias Kaiser, Aida Kemelmajer De Carlucci, Ann Kinzig and Jeroen Van Der Sluijs** along contributors from UNESCO and input from Nicholas De Sadeleer and Rosie Cooney
6. **R. Harding, C. Hendriks, and M. Faruqi**, in their oft recommended core text for Australian universities, *Environmental Decision-Making: Exploring Complexity and Context*, provide an intriguing expose of the complexities of decision making in the face of uncertainty and bring together many aspects of the environmental decision making within the context of sustainability and the sometimes conflicting aims of meeting ecological, economic and social goals. Whilst not strictly ‘about’ the precautionary principle, this book is valuable as it provides a concise overview of the background noise surrounding precautionary considerations, the ‘complex mix of actors and institutions - differing values and differing interests’.

A multidisciplinary approach is adopted with themes from political science, law, economics, philosophy, natural sciences, geography, engineering and sociology with practical examples and case studies. Whilst the emphasis is on the Australian experience with numerous examples and three extensive case studies, this does not make it any less relevant for international readers as a valuable insight in the complexities of environmental decision making. The text targets a broad audience and is equally relevant to readers from the scientific, technical or social science fields.

Implementation

The precautionary principle is a challenge. If implemented correctly, decision makers need to confront risks even where there is uncertainty as to the outcome of the risk materialising. The ramifications of a precautionary approach cut across all areas of risk assessment and management, environmental law, policy and regulation in every major sector from fisheries to persistent organic pollutants to climate change. No other environmental principle in environmental law has produced as much controversy as the precautionary principle. There is a growing body of literature dedicated to the implementation of the precautionary principle in a wide array of environmental circumstances. The following provide samples of implementation reviews.

7. In *The precautionary principle in practice: Environmental decision-making and scientific uncertainty*, **J. Peel** engages at the outset with the international literature and debates with substantial authority and provides a sound review of the theoretical underpinnings of the principle. Peel's principle aim however is to move beyond description of the principle and focus the debate on the larger problem of implementation and the need for some guidance for decision makers in uncertain decision environments. The text highlights a common theme in the literature that the precautionary principle represents a process, not a method to determine particular decisions.

In particular **Peel** concentrates on the 'context' of the decisions being made and the ever constant need for decision makers to be adaptable. Peel is guarded about using strict formulations (although necessary on occasions) and encourages decision makers to focus on the centrality of the underlying concept of precaution. Whilst unashamedly Australian in focus the case studies and conclusions provide a relevant and timely addition to the international discourse.

Peel tackles the seemingly endless problem of elaboration and elucidation of the core concepts of the principle through a consideration of a number of practical examples of implementation in different environmental management contexts. The overview is cross disciplinary ranging from: fisheries management, risk assessment for genetically modified organisms and environmental impact assessment for development applications.

At the outset **Peel** considers uncertainty in the decision making environment and the nature of scientific uncertainty. One of the exceptional elements of this book can be found here with the explanation of the complexity of uncertainty as including not only scientific uncertainty but also ‘non scientific’ uncertainty and how important it is to consider both in the decision process.

The significant ‘threshold’ issues are considered using case studies of fisheries management and development approvals for mobile phone towers to highlight both the significance of the threshold issues and the relevance of context to show how threshold works differently depending on context.

Thereafter **Peel** considers the application of the principle under varying circumstances highlighting the potential for adaptation. She critically examines the reversal of the burden of proof debate and explores synergies between the principle and environmental impact assessment. Peel then provides constructive advice on how implementation guidelines might be developed, foreshadowing the future debate surrounding the principle. Whilst this may seem a small thing, the index is one of the strengths of the text!

8. Moving away, in part, from the case study approach, **E. Fisher, J. Jones, and R. von Schomberg’s *Implementing the Precautionary Principle: Perspectives and Prospects*** is an edited text on the precautionary principle that provides insights from many respected authors in the field who have combined to ‘explore the complexities involved in its application’ (p.1). The ambition of the editors was to provide some insights into what was actually being done by administrators and regulators in response to the emerging legal presence of the precautionary principle in the decision making process. In particular the editors target the prospect of the application of the principle in emerging areas of biodiversity, climate change and nanotechnology amongst others. Whilst there is a definite Australian flavour to the text, the European jurisdiction is also represented in the contributions and there is also consideration of the United States context.

The invited authors wrote about what they perceived to be significant issues of implementation or possible future applications. This led to a diverse and intriguing compilation of thought provoking exposés. The text starts with an initial consideration of general perspectives and prospects of the principle (**Fisher, Jones and von Schomberg**). There is consideration of the normative challenges of the principle (**von Schomberg**), its role in environmental and public health policy (**Tickner and Kriebel**), and future application in areas such as biodiversity conservation (**Cooney**), climate change (**van der Sluijs and Turkenburg**), nanotechnology (**Rip**), and food safety (**Stirling, Renn and van Zwanberg**), along with the practical tensions of precaution and risk assessment in the regulatory framework, in this case GMO experience in Australia (**Peel**). For the writer

the stand out chapters were the particularly intriguing section on administrative constitutionalism (**Fisher** and **Harding**), **Gullet**'s overview of the judicial approach to the threshold test and the reflection on the burden and standard of proof requirements in the administrative context (**Jones** and **Bronitt**). Overall this is an extremely good consideration of a number of diverse areas relating to the precautionary principle. The text is challenging in parts but endlessly thought provoking and a serious contribution to the literature in this area.

9. **N. De Sadeleer** is well qualified to oversee this excellent compilation titled, *Implementing the Precautionary Principle: Approaches from the Nordic Countries, EU and USA*, from his contributing authors. The text has a distinctive northern hemisphere tilt and whilst the title refers to the USA, it must be said that the focus of the text is on the EC and the Nordic regions. This contribution to a developing body of literature focuses on the effectiveness or otherwise of the principle as assessed from regional perspectives, chiefly encompassing the five Nordic countries and the EC in sectors ranging from biotechnology, chemicals, GMOs, marine pollution, fisheries and nature conservation, using 18 analyses of different regulatory frameworks where precaution has been expressly or implicitly applied.

The book commences with an assessment of the status of the principle in the European Community legal order as exposed in judgments relating to matters such as nature protection, hazardous chemical, food safety and waste management, and moves to a comparative consideration of five national reports spanning the Nordic region. Thereafter the text concentrates on the practical application of the principle relation to 'ecological conservation measures' with fisheries attracting the attention of an entire chapter. There is a consideration of how the principle is being 'fleshed out' in EC, Norwegian, Swedish, Danish and Finnish law concentrating on areas such as Genetically Modified Organisms and Biodiversity. The final Part is dedicated to the EC and Nordic approaches to precaution and chemicals. In this Part there is one chapter dedicated to the Precautionary principle in US Law.

Whilst there is a recognition at the outset of the significance of the debate surrounding the principle and WTO trade issues, the book provides a timely warning that the debate should not be limited, as the principle "is of uttermost relevance to a spate of issues...where the free movement of good is not directly at stake." Accordingly, the book is specifically targeted at considering the application of precaution to risk management and risk assessment through analysis of a range of activities across a number of regulatory settings. As a result there is extensive consideration of the status and scope of the principle in national legal instruments and law along with international instruments such as *the Convention for the Protection of the Marine Environment of the North-East*

Atlantic (OSPAR), the Helsinki Commission (HELCOM), and the 1995 Fish Stock Agreement.

The debate

There were numerous candidates for selection under this heading as there is no doubt that the debate surrounding the use of the principle is substantial and ongoing. It is prudent, however, to note that as there are many versions of the principle, there are differing forms of criticism. The so-called ‘weak’ versions of the precautionary principle have, to some extent, avoided the strident critics with the most heated attacks directed at the strong version of the principle. Whilst the principle has strong supporters, the use of the principle is not without its critics, with its opponents viewing it as unscientific, radical, and an unsatisfactory alternative to Cost Benefit Analysis, with others highlighting the principle as being possibly a directive not to do anything or empowering its advocates to ignore jobs and wealth.

10. In this challenging text titled, *Rethinking Risk and the Precautionary Principle*, **J. Morris** has overseen a compilation of thoughtful and sometimes confronting contributions which take a critical look at the precautionary principle and assess its usefulness, some suggesting alternative ways of conceptualising threat for public policy decision-making in the face of uncertainty. **Morris** sets the tone of the text in chapter 1 where both the strong and weak versions of the principle are critically examined with the strong being condemned as a vehicle to justify the actions of interest groups and the weak version as open to wide interpretation and being used as a justification for arbitrary bureaucratic intervention. **Morris** concludes that the precautionary principle is not about risk management, it is philosophically unsound and “practical implementation often has harmful unintended consequences.” Overall, it is fair to say that the influence of ideological interest groups and pressures from economic interests was not lost on **Morris**.

Other contributors find the principle less valuable than ‘trial and error’, challenging the intergenerational justice foundations of the principle, criticising the use of the principle in the regulation of genetically modified crops, challenging the conventions based on the principle, demonstrating the perverse outcome of using the principle in the treatment of child–child and child-parent interactions, looking at the principle’s use in the EU ban of soft toys, and raising the concern of the possibility of science being manipulated to achieve a result. Examples are given where the use of the principle may in fact increase overall risk to public health and the environment in areas such as DDT use and the ban on genetically modified crops. Overall the text is well intended but relentless in its attack on the precautionary principle at all levels. This observation, however, should not be taken as a criticism as the text provides a significant contribution to the discussion and provides a valuable check and balance for those who may be moved to only see the good in the precautionary principle.

11. **R. Sunstein**, in *Laws of Fear: Beyond the Precautionary Principle*, presents a striking but polemic work. He is one of the most outspoken critics of the modern day adoption of the precautionary principle. According to **R. Sunstein**, the precautionary principle, for all its rhetorical appeal, is deeply incoherent. It is of course true that we should take precautions against some speculative dangers. But there are always risks on both sides of a decision: inaction can bring danger, but so can action. Precautions, in other words, themselves create risks—and hence the principle bans what it simultaneously requires.

At the outset it should be noted that the text is more concerned with strong versions of the principle. Whilst **R. Sunstein** attempts to define the principle, it is apparent he is working on the basis of some of the more extreme formulations, and well beyond even that envisaged by **Wingspread**. As **R. Sunstein** uses a particularly strong definition of precaution it is hardly surprising that he is then able to embark upon a somewhat strident criticism. This should not detract from the value of this text.

At the outset **R. Sunstein** explores the complex relationship between fear, danger, and the law. His work is fascinating as he contemplates why people are frightened, or alternatively why people feel safe when they should feel fear. **Sunstein** posits that humans are somewhat flawed when they consider risk and that regulation policy should follow statistical evidence, not the vulnerable perceptions of people. **Sunstein** uses examples such as global warming, terrorism, DDT, and genetic engineering to demonstrate the incoherence of the principle.

As for the precautionary principle he notes there are serious problems with the increasing influence of the principle, especially when causal chains are uncertain and it is not known that harm is likely to arise. **Sunstein** maintains that the principle does not provide a particularly useful or prudent guide for regulators and ultimately it can be downright dangerous. A brief review of this text in a recommended reading list cannot possibly do it justice. **Sunstein** is an eloquent and forceful writer and for anyone wanting to understand the precautionary principle and how complex the debate can be you must acquaint yourself with the work of **Sunstein**.

12. **A. Stirling** in the final recommended reading, *Risk, precaution and science: towards a more constructive policy debate. Talking point on the precautionary principle* provides a succinct, moderate and balanced discussion highlighting a number of scientific concerns over the application of the principle. The author maintains that “Although falling short of prescriptive decision rules, the precautionary principle does suggest a range of more modest, open-ended, but nonetheless highly effective methodologies and general qualities, which offer ways to complement and improve on conventional risk

assessment.” In contrast to polarising the debate between science v. fear **A. Stirling** suggests that precaution “offers a way to be more measured and rational about uncertainty, ambiguity and ignorance.” This paper is representative of the many excellent contributions offered by the scientific community as the debate progresses.