

*The Application of the Precautionary Principle in Practice.* By JOAKIM ZANDER.  
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IN RECENT YEARS, an abundance of legal and other literature on the precautionary principle has been published, much of which compares EU and US jurisprudence in the areas of environment and trade. No other work (or at least, none that is readily available via the usual legal databases) compares the application of the precautionary principle in the UK, Sweden, EU and the US. These are unusual choices for a comparative study but Zander's reasons are convincing. Within the EU, the UK and Sweden embody different approaches to the implementation of EU directives and regulations: Sweden has a long tradition of über-precaution whereas the UK traditionally applies an approach that owes as much to cost-benefit analysis as it does to principles of environmental law. The US generally has high standards of domestic environmental regulation but is perceived – at least by the EU – as accepting only a narrow definition of precaution in international law. The American popular and academic press appear to echo this: Zander cites both a *New York Times* byline “Precaution is for Europeans” (S. Loewenberg, 18 May 2003), and a US law journal article, in which it is argued that precaution is at odds with the American mentality: “... US culture embraces change and risk. Our heroes look forward – entrepreneurs and inventors who create what we have barely imagined, athletes who break physical boundaries, and stars of music and film who transcend behavioural conventions. The precautionary principle is not at the core of our national character..” (A. Babich, “Too Much Science in Environmental Law” (2003) 23:119 *Columbia Journal of Environmental Law* 267).

At the core of this book is a comparative analysis of the application of the precautionary principle to the regulation of pesticides and the establishment of mobile phone base stations. While this may not appeal to transcendental film stars, it does provide a lens through which the development of the application of the precautionary principle (as against the development of the principle itself) may be evaluated. And that is critically important to entrepreneurs and inventors as balancing of risk and benefit is central to regulation of science and new technologies in the EU and US.

The book is divided into eight chapters, each of which begins with a useful summary of the material contained therein. The short introduction is followed by a carefully-researched discussion of the concepts of risk and hazard. Separate chapters then review the application of the principle in the EU, Sweden, UK and US, and a chapter on international law covers the WTO and international environmental agreements. The balancing of risk with economic imperatives is a major theme throughout. Zander considers not simply the issues of interpretation and enforcement but the very nature of, and justification for, precaution in domestic and international law. Using examples of pesticides and mobile phone base stations, Zander's analysis demonstrates that contemporary environmental challenges cannot be conveniently delineated into science (i.e. defined risk) and non-science (i.e. poorly or non-defined risk) based issues and that most lie somewhere in between.

For the uninitiated, the science of risk began as a mathematical puzzle concerned with the optimization of gambling results. Later, it matured within a framework of economics and finance and is now generally understood to denote a situation or event in which it is possible to define possible outcomes

and assign a probability to the likelihood of each outcome. A hazard is a situation or event which may lead to harm and a risk is certain if the corresponding hazard is known to exist. Non-experts do not generally view risk in an objective manner: Viscusi identified a human tendency to take great care to avoid low probability risks while, at the same time, engaging in higher probability probably risks without much thought. This, coupled with the phenomenon observed by Sunstein, that man tends to believe in the benevolence of nature (i.e. that people fear natural pesticides less than they fear man-made pesticides, notwithstanding that the former may be just as toxic as the latter), may result in risk regulation regimes that are not based solely on rational criteria. Further, risks, and particularly environmental risks, often come with “trailing clouds of vagueness” (K. I. Arrow, “Know a Hawk from a Handsaw” in M. Szenberg (ed.), *Eminent Economists: Their Life and Philosophies* (Cambridge, 1992), p. 42), that is, with an absence of scientific certainty. The precautionary principle offers protection against such clouds.

There is no single definition of the principle but common to most is the notion that where there is a risk of harm, lack of scientific certainty should not prevent action to limit or mitigate that harm. Cost-effectiveness is added to that formula by Principle 15 of the 1992 Rio Declaration on Environment and Development: “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”. The definition most commonly used in the EU is from the 1998 *BSE* case: “Where there is uncertainty as to the existence or extent of risks to human health, the institutions may take protective measures without having to wait until the reality and seriousness of those risks becomes fully apparent” (Case C-180/96, *United Kingdom v Commission* [1998] ECR I-2265, paragraph 99).

Two years later, the Commission issued a (non-binding) Communication which extended the application of the principle to environment, animal and plant health, stating that the principle may be employed: “... in those specific circumstances where scientific evidence is insufficient, inconclusive or uncertain and there are indications through preliminary objective scientific evaluation that there are reasonable grounds for concern that the potentially dangerous effects on the environmental, human, animal or plant health may be inconsistent with the chosen level of protection” (Commission Communication on the Precautionary Principle, COM (2000) 1, 10). This corresponds with the four widely recognised categories of scientific uncertainty. These are inaccuracy or imprecision in measurement, lack of information, conflicting information, or inability to undertake measurement, either completely or at all. The value of a cubic metre of timber, for example, is readily obtainable from market figures but that value cannot be measured with complete accuracy when the timber has not yet been harvested and is part of a standing tree with many functions (e.g. wildlife habitat, carbon storage and sequestration, soil stability) in a tropical forest.

Within the EU, application of the principle now occurs at two levels. Initially, it informs the content of EU legislation, either directly or indirectly, most commonly in the areas of environment, food safety and agriculture. It is often then used by member states who seek to derogate from free movement provisions or harmonisation measures, on the grounds of environment, human, animal or plant health. Zander describes this application as the use of a magic wand, the invocation of which can justify almost any policy choice.

The application of the precautionary principle within the EU is neither straightforward, nor consistent. Similar facts are not always treated in a similar manner and derogations can undermine the careful compromises which underpin the EU. Ultimately, this may result in fragmentation of the internal market. At both EU and international level, it is difficult to identify sufficiently consistent practice and *opinion juris* necessary for the concept to assume the status of customary international law. Further, EU and international courts tend not to scrutinise scientific data, little is required to establish scientific uncertainty and once that uncertainty has been established, courts rarely investigate the extent to which cost-benefit and risk trade-off analyses have considered by institutions waving the principle's magic wand. Consequently, the application of the principle tends to be arbitrary, there is no requirement that it be efficient or effective, and redress is limited.

In international law, although a precautionary approach underpins numerous environmental agreements (e.g. 1968 African Convention on the Conservation of Nature and Natural Resources, 1971 Ramsar Convention, 1972 World Heritage Convention, 1973 Convention on International Trade in Endangered Species, 1982 United Nations Convention on the Law of the Sea), the word "precautionary" did not appear in international agreements until the 1985 Vienna Convention for the Protection of the Ozone Layer and even then, it was used only in the preamble to describe measures that had already been taken at national and international level. Nonetheless, the principle has featured prominently in cases before the ICJ and ITLOS: *Nuclear Tests*, *Gabcikovo-Nagymaros*, *Southern Bluefin Tuna* and the *MOX Plant Case* spring to mind. It has also been central to many WTO disputes including *EC-Hormones*, *EC-Biotech*, *Japan-Apples* and *Australia-Salmon*.

Zander concludes by summarising three ways in which the principle is currently articulated. First, it may be a fundamental principle which obliges governments to act in a precautionary manner. This is the position under the Swedish Environmental Code. Second, it may enable governments to act in a precautionary manner when they wish to do so. This applies in the EU and to a lesser extent, in UK. Third, it may be applied only after procedural steps (including confirmation of the risk and a cost benefit analysis of the proposed regulatory measures) have been taken. This approach is followed by the US (and the WTO).

But there are inconsistencies in these approaches and even in legal systems in which the precautionary principle is codified, Zander finds that it is often poorly defined or ambiguous. Three points flow from this. First, the principle does not seek to safeguard the just and fair application of the law. Second, courts have generally been reluctant to define the precise content and parameters of the principle and third, the principle's application is generally confined to certain areas of law and it tends not to inform the entire body of domestic law. This, Zander argues, suggests that the principle is better understood as a policy choice and not as a traditional legal principle.

This leads Zander to conclude that a more rational approach to risk regulation is long overdue. He proposes the introduction of guidelines, under the terms of which a party wishing to invoke restrictive measures would be required to demonstrate a plausible relationship, based on independent scientific advice, between the activity to be restricted and the risk arising from that activity. A cost-benefit analysis of the proposed restrictive measures would also be required. Regulators would be required to rank risks in order of importance

and to provide reasons if they choose not to follow the established ranking when targeting risks. This, according to Zander, would enable affected parties to challenge precautionary measures which do not confirm with published guidelines.

Zander's proposal hits the nail on the head. As he explains, a truly precautionary approach cannot mean that one risk is targeted while other potentially more hazardous risks are left unregulated. Effective regulation should decrease the overall level of risk to society and for that to occur, the full spectrum of risks must first be considered. The precautionary principle does indeed have a place in EU and international law but for it to be credible, it must be defined and applied in a coherent, predictable, efficient and effective manner. It is difficult to argue with such persuasive logic.

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*The Amazon from an International Law Perspective.* By BEATRIZ GARCIA.  
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THE AMAZON region covers an area of approximately 7.5 million square kilometres and comprises approximately 44 per cent of the territory of South America. It is primarily located in Brazil but extends into Bolivia, Colombia, Ecuador, Guyana, Peru, Venezuela and Suriname. The river basin is critically important for biodiversity, freshwater, climate and indigenous culture but protection is limited: it appears that the Brazilian Amazon currently has the world's highest absolute rate of deforestation. In real terms, this equates to the destruction of millions of hectares of forest per year.

Against this background, this book aims to examine the forms of cooperation that exist among the Amazon states, and between them and the international community, and to consider the extent to which international cooperation may help to reverse environmental degradation in the region. Taking as its starting point the somewhat trite assertion "... cooperation is required at different levels in order to effectively handle some environmental problems" (p. 2), the book is premised on the assumption that Amazon states and the international community share "a common interest" in the protection of the Amazon and that this interest will best be served by "bringing the Amazon States closer together" (p. 5).

The book is divided into ten chapters, the first eight of which are largely descriptive. Underpinned by extensive research, these chapters cover the characteristics of the region, the origins of regional cooperation, the 1978 Amazon Cooperation Treaty, other regional legal instruments, regional organizations, multilateral treaties and global actors, and positive incentives for protection (i.e. carbon trading, Reducing Emissions from Deforestation and Forest Degradation and Payment for Environmental Services). It is in the last two chapters that much of the legal analysis is located.

In fact, Garcia's analysis relies on three streams of literature. First, the literature of public international law is used to frame the discussion of multi-lateral treaties. Some reference is also made to aspects of international environmental law. Second, the literature of international relations (as applied to the Amazon states) and the corresponding practice of diplomacy provides