

# PRECAUTION — A MATTER OF PRINCIPLE, APPROACH OR PROCESS?

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*[In the 'global risk society' of late modernity, issues of scientific uncertainty and their impact on the regulation of technological risk have achieved prominence both domestically and internationally. The 'precautionary principle', included in the Rio Declaration on Environment and Development and a range of other international instruments, counsels a proactive approach to addressing serious or irreversible threats to health or the environment in circumstances of 'lack of full scientific certainty'. The important message of precaution, however, is currently in danger of becoming bogged down in an international legal quagmire of terminological debate over its status as a 'principle' or an 'approach'. Although from a textual perspective there may be little to differentiate the two formulations, the course of recent multilateral negotiations and interstate disputes has invested the labels 'precautionary principle' and 'precautionary approach' with particular political meanings which reflect fundamentally different attitudes and regulatory approaches to issues of health and environmental risk. The political salience of the language of principle versus approach is reflected in the reluctance of courts to rule on the international status of precaution, instead developing compromise formulations which characterise the concept in terms of 'prudence'. While establishing a middle road between politically, even ideologically, charged versions of precaution as a principle or as an approach, without clarification of the implications of 'prudence and precaution' for risk regulatory processes, this may do little to advance the international understanding of how precaution is to be applied in risk-related decision-making. This commentary explores the different understandings of precaution as a matter of 'principle', 'approach' and 'prudence' that have emerged in the international arena over the last decade. It argues that disentangling precaution from politically divisive debate relies on forging a new international understanding of its meaning that responds to the core concern of scientific uncertainty and focuses on the implications of uncertainty for processes of risk-related decision-making.]*

## CONTENTS

- I Introduction
- II Precaution as a Matter of 'Principle'
- III Precaution as an 'Approach'
- IV Precaution as 'Prudence'
- V Precaution as Process
- VI Conclusion

## I INTRODUCTION

These days, the concept of precaution requires little introduction. In the space of a few decades, an obscure principle of German environmental policy has become an important aspect of contemporary international law not only in the field of environmental conservation, but also in the areas of food safety, health

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protection and agricultural trade.<sup>1</sup> Scholars, activists and community members alike debate the meaning and consequences of precaution for the use of human technologies with potential, but uncertain, risks. Precaution appears in a growing number of international treaties and animates interstate disputes over the existence of various health and environmental threats. In a global 'risk society', the continuing relevance of precaution is assured by communities' concern with the possibility of harm in circumstances where science is unable to offer guarantees of safety.<sup>2</sup>

As precaution has grown in prominence internationally, so it has become a focus of political debate and conflict. At its heart, precaution is a reminder of the limitations of scientific knowledge as a guide to decision-making, and a warning to heed the lessons of the past to prevent the occurrence of environmental damage in the future.<sup>3</sup> But how this simple message is interpreted depends on the risk attitude of the interpreter. The risk-averse see in precaution a call to ban all technologies with potential health or environmental impacts, even where the likelihood of harm is not well established.<sup>4</sup> Those who embrace risk as opportunity, however, view an excess of precaution as a danger in itself, since it might prevent the development of worthwhile technologies based on unsubstantiated fears of future damage.<sup>5</sup> While both camps recognise the importance of a realistic understanding of the capacities of science to guide

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<sup>1</sup> The German origin of the precautionary principle in the concept of *Vorsorge* (literally, 'prudence and foresight') has become part of the accepted 'mythology' of the principle: see Sonja Boehmer-Christiansen, 'The Precautionary Principle in Germany — Enabling Government' in Tim O'Riordan and James Cameron (eds), *Interpreting the Precautionary Principle* (1994) 31. This origins story is not universally accepted, with others ascribing Swedish heritage to the underlying idea that regulatory authorities 'do not have to demonstrate that a certain impact will occur; instead, the mere risk (if not too remote) is to be deemed enough to warrant protective measures or a ban on the activity': Staffan Westerlund, 'Legal Antipollution Standards in Sweden' (1981) 25 *Scandinavian Studies in Law* 223, 231.

<sup>2</sup> Ulrich Beck, *Risk Society: Towards a New Modernity* (1992) 19–24.

<sup>3</sup> Several such 'lessons' learned with hindsight are discussed in European Environment Agency, *Late Lessons from Early Warnings: The Precautionary Principle 1896–2000: Environmental Issue Report No 22* (2001).

<sup>4</sup> See, eg, the much-cited *Wingspread Statement on the Precautionary Principle*, 25 January 1998, issued by a conference convened by environmentalists and environmental organisations, which states:

When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause-and-effect relationships are not fully established scientifically. In this context the proponent of an activity, rather than the public, should bear the burden of proof.

This text is reproduced in Carolyn Raffensperger and Joel Tickner (eds), *Protecting Public Health and the Environment: Implementing the Precautionary Principle* (1999) appendix A, 353–4.

<sup>5</sup> Critical views of this kind are expressed in several of the essays collected in Julian Morris (ed), *Rethinking Risk and the Precautionary Principle* (2000). See also Frank Cross, 'Paradoxical Perils of the Precautionary Principle' (1996) 53 *Washington and Lee Law Review* 851; Indur Goklany, *The Precautionary Principle: A Critical Appraisal of Environmental Risk Assessment* (2001).

decision-making,<sup>6</sup> they differ sharply in their appreciation of the ‘seriousness’ of potential health or environmental risks in the face of imperfect scientific knowledge.

In the politically charged international arenas of multilateral negotiations and interstate dispute settlement, differences between countries are frequently heightened rather than resolved; this is particularly so in situations involving questions of health and environmental risk, where differences between communities over the acceptability of different threats can often be stark. In recent times, international negotiations dealing with such issues have produced deep divisions between countries and generated a number of disputes. The international controversy over approaches to risk regulation and decision-making is most clearly manifested in the current United States–European Union trade war concerning genetically modified organisms (‘GMOs’),<sup>7</sup> a dispute which reflects broader international debate over the possible — environmental, health, social and ethical — risks posed by biotechnology.

Raised in such contexts, precaution has provided a legal language for expressing political differences in risk attitude and regulatory approach in the face of the common problem of scientific uncertainty. International lawyers — with their attention to issues of terminology — have fashioned this debate into a clash between two different understandings of precaution: precaution as a ‘principle’ and precaution as an ‘approach’. While on its face a semantic issue, the precautionary principle–approach debate masks deeper political differences that have more to do with divergent views about the significance of potential health or environmental risks than the details of the available scientific evidence. Disentangling precaution from this legal and political quagmire relies on forging a new understanding of its meaning that responds to the core concern of environmental decision-making under conditions of scientific uncertainty. This commentary argues there is more to be gained in this regard from viewing precaution in process terms than from continuing to engage in irresolvable, political disputes over its standing as a ‘principle’ or as an ‘approach’.

## II PRECAUTION AS A MATTER OF ‘PRINCIPLE’

As a matter of expression, if not of substance, the idea of precaution as a principle would seem to be uncontroversial. In the *Rio Declaration on Environment and Development*,<sup>8</sup> the primary international expression of

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<sup>6</sup> Even detractors of precaution, who are highly critical of the apparent disregard of regulatory costs when the precautionary principle is applied to address any risk, are nevertheless supportive of what they label ‘weak’ versions of precaution — ‘that a lack of decisive evidence of harm should not be grounds for refusing to regulate’: Cass Sunstein, ‘Beyond the Precautionary Principle’ (2003) 151 *University of Pennsylvania Law Review* 1003, 1012.

<sup>7</sup> The WTO stage of the dispute was initiated by three complainants, including the US, in May 2003. See *European Communities — Measures Affecting the Approval and Marketing of Biotech Products — Request for Consultation by the United States*, WTO Doc WT/DS291/1 (2003). For submissions of the parties to the WTO Panel currently considering the case, see International Centre for Trade and Sustainable Development, *EU Biotech Case* (2004) <<http://www.trade-environment.org/page/theme/tewto/biotechcase.htm>> at 1 October 2004.

<sup>8</sup> United Nations Environment Programme, *Rio Declaration on Environment and Development*, Annex, UN Doc A/CONF.151/26 (1992) (‘*Rio Declaration*’).

precaution, the concept is expressed in terms of the following principle:

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.<sup>9</sup>

Precaution is also frequently described as either ‘principle 15’ or the ‘precautionary principle’ in the many international environmental treaties in which it appears.<sup>10</sup> In an area of international law dominated by ‘soft law’,<sup>11</sup> the designation of precaution as a principle of international environmental law might be taken to reflect the notion of something that ‘states a reason that argues in one direction, but does not necessitate a particular decision’.<sup>12</sup> The precautionary principle, on this basis, could be interpreted as a general call for scientific uncertainty to be taken into account in making decisions on how to address threats of serious or irreversible environmental damage, rather than a hard-and-fast rule that dictates the same result in every case.<sup>13</sup>

In recent times, however, the label of ‘principle’ seems to have become a politically charged one when applied to the concept of precaution. The precautionary principle, particularly in the eyes of some environmental non-governmental organisations (‘NGOs’), stands as a presumption in favour of the environment or the protection of human health in circumstances of ‘lack of full scientific certainty’ as to the nature or extent of potential harm.<sup>14</sup> It is often associated with a sceptical view of the utility of science for informing decisions on risk, as well as arguments for the burden of proving safety to be shifted entirely to the proponents of new technologies.<sup>15</sup> Although principle 15 of the *Rio Declaration* is expressed in negative terms — scientific uncertainty should

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<sup>9</sup> Ibid principle 15.

<sup>10</sup> Prominent examples include the *Convention on the Ban of the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa*, opened for signature 29 January 1991, 30 ILM 773, art 4(3)(f) (entered into force 22 April 1998) and the *Convention for the Protection of the Marine Environment of the North-East Atlantic*, opened for signature 22 September 1992, 32 ILM 1069, art 2(2)(a) (entered into force 25 March 1998) (‘*OSPAR Convention*’).

<sup>11</sup> As opposed to ‘hard law’, soft law rules are not binding although they play an important role by ‘point[ing] to the likely future direction of formally binding obligations, by informally establishing acceptable norms of behaviour, and by “codifying” or possibly reflecting rules of customary law’: Philippe Sands, *Principles of International Environmental Law* (2<sup>nd</sup> ed, 2003) 124.

<sup>12</sup> See Ronald Dworkin, *Taking Rights Seriously* (1977) 26.

<sup>13</sup> Lisa Wyman, ‘Acceptance of the Precautionary Principle — Australian v International Decision-Makers’ (2001) 18 *Environmental and Planning Law Journal* 395, 396–7.

<sup>14</sup> See, eg, the Greenpeace position statement issued at the World Summit on Sustainable Development in 2002: Greenpeace, *The Precautionary Principle* (2002) <[http://archive.greenpeace.org/earthsummit/background\\_precprinciple.html](http://archive.greenpeace.org/earthsummit/background_precprinciple.html)> at 1 October 2004.

<sup>15</sup> See, eg, *Final Declaration of the First European ‘Seas at Risk’ Conference*, annex 1, Copenhagen (1994), which provides that:

the “burden of proof” is shifted from the regulator to the person or persons responsible for the potentially harmful activity, who will now have to demonstrate that their actions are not/will not cause harm to the environment. If the “worst case scenario” for a certain activity is serious enough, then even a small amount of doubt as to safety of that activity is sufficient to stop it taking place.

This text is quoted in Richard Stewart, ‘Environmental Regulatory Decision Making under Uncertainty’ in Timothy Swanson (ed), *An Introduction to the Law and Economics of Environmental Policy: Issues in Institutional Design* (2002) 71, 78.

not be used as a reason for postponing protective measures — when used in the ‘precautionary principle’ sense, precaution is more often represented as imposing a positive obligation on regulators to act to prevent the materialisation of health or environmental risks, despite the existence of scientific uncertainty over their nature or extent. The existence of scientific uncertainty becomes a trigger for precautionary measures, and for ‘reversing the onus of proof’ so that proponents, rather than regulators, bear the burden of demonstrating that there is no need for regulatory action.<sup>16</sup>

In multilateral negotiations dealing with issues of health and environmental risk, the most prominent champion of the precautionary principle has been the EU. In part this stems from the important role played by the ‘precautionary principle’ in EU environmental law and policy,<sup>17</sup> but the way precaution has been interpreted and applied by EU institutions in decision-making also reflects an institutional awareness of the need to take a more proactive and socially responsive approach to risk regulation following a series of health and food safety-related crises in Europe.<sup>18</sup> The jurisprudence of the European Court of Justice affirms an understanding of precaution that:

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 become fully apparent.<sup>19</sup>

While precaution is expressed here as something permitting or authorising regulatory action rather than requiring it, subsequent jurisprudence of the European Court of First Instance suggests the EU is moving towards an understanding of the precautionary principle more in line with a *duty* to take protective measures where scientific uncertainty over the health or environmental impacts of activities is raised.<sup>20</sup> In the recently decided *Pfizer Animal Health SA v Council of the European Union*<sup>21</sup> and *Alpha Pharma Inc v*

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<sup>16</sup> Nicholas de Sadeleer, *Environmental Principles: From Political Slogans to Legal Rules* (Susan Leubusher trans, 2002) 203–6.

<sup>17</sup> See the *Consolidated Version of the Treaty Establishing the European Community*, [2002] OJ C 325, 33 art 174(2) EC (‘*EC Treaty*’).

<sup>18</sup> The bovine spongiform encephalopathy (‘mad cow disease’) crisis was the most prominent of such scandals, but public concern in EU and Member State risk regulation was also damaged by incidents such as ‘dioxin found in Belgian chicken feed’ and ‘tainted blood uncovered in French blood banks’. Commentators trace the current public scepticism in Europe regarding genetically modified organisms to the ‘crisis in science and government’ sparked by these incidents: See Ragnar Löfstedt and David Vogel, ‘The Changing Character of Regulation: A Comparison of Europe and the United States’ (2001) 21 *Risk Analysis* 399, 403.

<sup>19</sup> See *United Kingdom of Great Britain and Northern Ireland v Commission of the European Communities* (C–180/96) [1998] ECR I–2265, I–2298.

<sup>20</sup> It is arguable that construction of precaution in terms of a duty rather than merely an authorisation of conduct flows from the requirement in the EC Treaty for Community environmental policy ‘to aim at a high level of protection’: See *EC Treaty*, art 174(2) EC. In contrast, where environmental protection is one of a number of objectives, which also include economic efficiency in the use of resources, precaution is more likely to be construed as creating an obligation to take action only where ‘threats of serious or irreversible damage’ are clearly established: See *Dixon and Australian Fisheries Management Authority and Executive Director of Fisheries WA and Northern Territory of Australia* [2000] AATA 442 (Unreported, Pamela Burton, Senior Member, 5 June 2000) [102].

<sup>21</sup> (T-13/99) [2002] ECR II-3305 (‘*Pfizer*’).

*Council of the European Union*<sup>22</sup> cases, the Court of First Instance accepted that the EU regulatory institutions could rely on the precautionary principle to revoke authorisations for certain antibiotics used as growth promoters in animal feed ‘even though, owing to existing scientific uncertainty, the reality and the seriousness of the risks to human health associated with that use were not yet fully apparent’.<sup>23</sup> Scientific evidence concerning the risk that feeding animals antibiotic growth promoters could lead to the development of resistant bacterial strains — eventually posing a problem for the treatment of infections in human medicine — was inconclusive at best and the EU Commission had not carried out a full risk assessment prior to taking precautionary measures.<sup>24</sup> Nevertheless, the Court considered that ‘the Community institutions were not required, for the purpose of taking preventive action, to wait for the adverse effects of the use of the product as a growth promoter to materialise’<sup>25</sup> and ‘could properly adopt a cautious approach’ despite limited evidence of any immediate risk for human health posed by feed additives.<sup>26</sup>

At the international level, the EU, together with various like-minded countries in the region<sup>27</sup> and a number of (mostly Francophone) developing countries, have advocated a similar understanding of precaution in several negotiating settings. In multilateral negotiations for the *Cartagena Protocol on Biosafety to the Convention on Biological Diversity*,<sup>28</sup> held in Montreal in 2000, the EU and its allies pushed for the inclusion of the precautionary principle as the basis for national decision-making on transboundary movements of GMOs.<sup>29</sup> The resulting compromise in art 10(6) of the *Biosafety Protocol* does not refer expressly to precaution but provides that parties are not prevented from taking a decision regarding the import of a particular GMO given a

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<sup>22</sup> (T-70/99) [2002] ECR II-3495 (*Alpharma*).

<sup>23</sup> *Pfizer* (T-13/99) [2002] ECR II-3305 [140]; *Alpharma* (T-70/99) [2002] ECR II-3495 [153].

<sup>24</sup> Indeed in *Alpharma* (T-70/99) [2002] ECR II-3495, the contested regulation had been issued without the EU Commission first seeking an opinion from the Scientific Committee for Animal Nutrition, an expert committee specifically established to provide scientific advice to Community institutions on issues relating to animal feedstuffs. The Court ruled that such consultation was not mandatory although it was, at [213],

only in exceptional circumstances and where there are adequate guarantees of scientific objectivity that the Community institutions may, when — as here — they are required to assess complex facts of a technical or scientific nature, adopt a preventive measure withdrawing authorisation from an additive without obtaining an opinion from those scientific committees.

Nevertheless, the Court was satisfied that ‘exceptional’ circumstances had been established and accepted that the Community institutions were able to reach conclusions about the risk at issue on the basis of other scientific information available to them, albeit general in nature: at [317].

<sup>25</sup> *Pfizer* (T-13/99) [2002] ECR II-3305 [141]; *Alpharma* (T-70/99) [2002] ECR II-3495 [154].

<sup>26</sup> *Pfizer* (T-13/99) [2002] ECR II-3305 [335]; see also *Alpharma* (T-70/99) [2002] ECR II-3495 [269].

<sup>27</sup> Switzerland and Norway commonly side with the EU when it comes to questions of precaution in international negotiations.

<sup>28</sup> Opened for signature 29 January 2000, 39 ILM 1027 (2000) (entered into force 11 September 2003) (*Biosafety Protocol*).

<sup>29</sup> *Ibid.* The *Biosafety Protocol* uses the terminology of ‘living modified organisms’ in preference to the more commonly recognised term, GMOs.

[I]lack of scientific certainty due to insufficient relevant scientific information and knowledge regarding the extent of the potential adverse effects of a living modified organism on the conservation and sustainable use of biological diversity in the Party of import, taking also into account risks to human health.<sup>30</sup>

More recently, at the 2002 World Summit on Sustainable Development, the EU argued in favour of development of the precautionary principle along the lines of the *Biosafety Protocol*, an issue which produced one of the deepest political divisions of the Summit.<sup>31</sup>

The EU has also actively sought to promote precaution as a matter of principle in the forum of international dispute settlement. In the case of *European Communities — Measures concerning Meat and Meat Products (Hormones)*, decided under the dispute settlement system of the World Trade Organization, the European Communities<sup>32</sup> argued that the precautionary principle is ‘a general customary rule of international law or at least a general principle of law, the essence of which is that it applies not only in the management of a risk, but also in the assessment thereof’.<sup>33</sup> The thrust of the EC’s argument was that precaution entitled it to reach a finding of risk to human health despite the absence of scientific evidence indicating a link between the ingestion of beef containing residues of growth-promoting hormones and the development of cancer in consumers. The EC claimed that existing scientific studies could not rule out the risk, albeit small, of ingested hormone residues giving rise to cancer.<sup>34</sup> In light of such uncertainties, and taking into account the seriousness with which the issue was viewed by Europeans — sensitised over the years by a series of scandals involving misuse of growth-promoting hormones — the EC argued that it was entitled to rely on the precautionary principle as a justification for its regulatory measures.

A similar understanding of precaution, framed in terms of the ‘precautionary principle’ underlies the arguments of an EU member, Ireland, in a more recent dispute over the possibility of radioactive pollution of the Irish Sea as the result of the commissioning of a mixed oxide (‘MOX’) nuclear reprocessing plant at Sellafield in the United Kingdom. In its Memorial prepared for the purposes of an arbitration of the dispute under the *United Nations Convention on the Law of*

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<sup>30</sup> Ibid art 10(6).

<sup>31</sup> See International Institute for Sustainable Development, ‘Summary of the World Summit on Sustainable Development: 26 August – 4 September 2002’ (2002) 22(51) *Earth Negotiations Bulletin* 5.

<sup>32</sup> In the international trade context, the EC, rather than the EU, is recognised as the representative body of the regional organisation for the purposes of multilateral trade negotiations and WTO dispute settlement: See Patricia Birnie and Alan Boyle, *International Law and the Environment* (1992) 67–8.

<sup>33</sup> *European Communities — Measures concerning Meat and Meat Products (Hormones)*, WTO Doc WT/DS26/AB/R, WT/DS48/AB/R, AB-1997-4 (1998) [16] (Report of the Appellate Body) (‘*Beef Hormones Appellate Body Report*’).

<sup>34</sup> *European Communities — Measures concerning Meat and Meat Products (Hormones)*, WTO Doc WT/DS26/R/USA (1997) [8.149] (Complaint by the US — Report of the Panel) (‘*Beef Hormones Panel Report*’).

*the Sea*,<sup>35</sup> Ireland states:

The fact that the consequences [of increasing radioactive pollution of the Irish Sea] are unforeseeable or unknown does not mean that they can be ignored. It is self-evident that radiation is hazardous, that radioactive contamination of the seas is a problem that cannot be brushed aside, and that there are considerable uncertainties as to its effects on humans and the environment. It must be addressed. That is the point of the precautionary principle.<sup>36</sup>

Reflecting the idea of precaution as imposing a positive obligation to address threats of environmental damage, an essential element of the Irish argument in the *MOX Plant Arbitration*, is that the burden of demonstrating that no harm will result from commissioning of the facility at issue lies with the UK. In an earlier phase of the dispute, concerning Ireland's access to certain commercial information prepared as part of the assessment process for the MOX plant, this argument was accepted by the dissenting member of the arbitral tribunal. Gavan Griffith QC maintained that 'the obvious application of the precautionary principle ... must shift the burden to the United Kingdom'<sup>37</sup> such that Ireland's claim of threatened harm to the Irish Sea would only be dismissed if '*in fact* there was no such potentially adverse effect'.<sup>38</sup> However, the majority of the tribunal in the case did not make any reference to the precautionary principle, reaching a conclusion that suggested that the burden of demonstrating adverse environmental effects lay with Ireland rather than the UK.<sup>39</sup>

### III PRECAUTION AS AN 'APPROACH'

In opposition to the idea of precaution as a matter of principle, an alternative understanding of precaution has developed over the past decade, which sees precaution as simply an 'approach' to decision-making. From the standpoint of terminology, the expression 'precautionary approach' has no lesser lineage in international law than the 'precautionary principle'. After all, principle 15 of the *Rio Declaration* provides: 'In order to protect the environment, the *precautionary approach* shall be widely applied by States according to their capabilities'.<sup>40</sup>

What is entailed by the precautionary approach and how this might differ from implementation of the precautionary principle is not clear. Many eminent commentators on international environmental law regard the distinction as without meaning,<sup>41</sup> noting that the terms are used interchangeably in many

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<sup>35</sup> Opened for signature 10 December 1982, 1833 UNTS 3 (entered into force 16 November 1994) ('UNCLOS').

<sup>36</sup> *Dispute concerning the MOX Plant, International Movements of Radioactive Materials, and the Protection of the Marine Environment of the Irish Sea (Ireland v UK) (Written Pleadings of Ireland)* [2002] PCA 63 <<http://www.pca-cpa.org>> at 1 October 2004 ('*MOX Plant Arbitration*').

<sup>37</sup> *Dispute concerning Access to Information under Article 9 of the OSPAR Convention (Ireland v UK) (Final Award)* [2003] PCA 85 <<http://www.pca-cpa.org>> at 1 October 2004.

<sup>38</sup> *Ibid* 87 (emphasis in original).

<sup>39</sup> *Ibid* 57.

<sup>40</sup> *Rio Declaration*, above n 8, principle 15 (emphasis added).

<sup>41</sup> Patricia Birnie and Alan Boyle, *International Law and the Environment* (2<sup>nd</sup> ed, 2002) 116.

settings.<sup>42</sup> Certainly, the use of precaution in international treaties does not resolve the issue. Several of the treaties which use the expression precautionary approach place it side by side with references to ‘principle 15’ of the *Rio Declaration*.<sup>43</sup>

Yet at a political level the distinction between the precautionary principle and a precautionary approach is one that seems to have increasing resonance. Precaution as merely an approach has become a notion championed by several states in response to concerns of others over the possible risks of new technologies, particularly GMOs. In negotiations for the *Biosafety Protocol*, opposition by the US and other members of the agricultural exporters’ bloc known as the ‘Miami Group’<sup>44</sup> resulted in the omission of the term ‘precautionary principle’ from the text in favour of references to the ‘precautionary approach’.<sup>45</sup> In its WTO clash with the EC over hormone-grown beef, the US likewise strongly resisted attempts to designate precaution as a principle of customary international law, arguing that at best ‘it may be characterised as an “approach” — the content of which may vary from context to context’.<sup>46</sup>

One way of conceptualising what might be meant by precaution as an approach, which is consistent with these arguments, is to say that it authorises or permits regulators to take precautionary measures in certain circumstances, without dictating a particular response in all cases. Rather than a principle creating an obligation to act to address potential harm whenever scientific uncertainty arises, an approach could give regulators greater flexibility to respond, depending on their appreciation of underlying uncertainties and the seriousness of threatened environmental damage. In situations where a high degree of value attaches to the aspect of health or the environment potentially affected by an activity, applying this understanding of precaution would lead to stricter precautionary measures than in situations where strong, countervailing social and economic considerations exist.<sup>47</sup> The presence of scientific uncertainty thus becomes an indicator of the need for a ‘precautionary approach’ to decision-making, but not an automatic trigger for protective measures.

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<sup>42</sup> In its submission to the WTO Panel deciding the current GMO dispute, the EC uses references to the ‘precautionary principle’ and the ‘precautionary approach’ interchangeably, reflecting the flexible use of terminology found in many international environmental treaties that include the concept of precaution. See *European Communities — Measures Affecting the Approval and Marketing of Biotech Products*, WTO Doc WT/DS291, WT/DS292, WT/DS293 (2003) (First Written Submission by the European Communities).

<sup>43</sup> A formulation such as ‘the precautionary approach contained in principle 15 of the *Rio Declaration*’ has been used in a number of recent environmental treaties such as the *Biosafety Protocol*, above n 28, preamble, art 1, as well as the *Stockholm Convention on Persistent Organic Pollutants*, opened for signature 22 May 2001, 40 ILM 531, art 1 (entered into force 17 May 2004)

<sup>44</sup> Members of this group included the US, Canada, Australia, Argentina, Uruguay and Chile.

<sup>45</sup> See *Biosafety Protocol*, above n 28, preamble, art 1.

<sup>46</sup> *Beef Hormones Appellate Body Report*, WTO Doc WT/DS26/AB/R, WT/DS48/AB/R, AB-1997-4 (1998) [43].

<sup>47</sup> Michael Young, *For Our Children’s Children: Some Practical Implications of Inter-Generational Equity and the Precautionary Principle: Resource Assessment Commission Occasional Publication No 6* (1993) 16–17.

When raised in politically charged contexts, however, as when health and environmental obligations come into conflict with the requirements of international trade law, the language of a precautionary approach apparently carries with it a far more restrictive meaning. In the case of trade in agricultural products, a number of countries (the US and Australia included) have questioned whether the EU's precautionary policies are a disguise for protectionist measures, primarily designed to protect domestic EU producers who have received generous subsidies in the past.<sup>48</sup> Such countries often insist that the appropriate scope for precaution in risk-related decision-making is reflected in provisions such as art 5.7 of the *Agreement on the Application of Sanitary and Phytosanitary Measures*,<sup>49</sup> which allows WTO Members to adopt risk regulatory measures provisionally '[i]n cases where relevant scientific evidence is insufficient', provided they 'seek to obtain the additional information necessary for a more objective assessment of risk'.<sup>50</sup> The adoption of 'precautionary' measures under art 5.7 is dependent upon a finding that the available scientific evidence concerning the risk at issue is 'insufficient' for the purpose of undertaking an adequate assessment of risk.<sup>51</sup> Existing jurisprudence under the *SPS Agreement* suggests that this precondition will be met where there is very little scientific research regarding the adverse effects of a particular technology, but is less likely to be satisfied in those cases where non-scientific factors exercise an important influence over risk perception.<sup>52</sup>

In the international trade context, endorsement of a 'precautionary approach' over the 'precautionary principle' seems to be based upon a concern, voiced particularly by the US and other agricultural exporters, 'that the "precautionary principle" can lead to governments basing decisions to do with risk on factors other than science'.<sup>53</sup> An insistence on precaution as an approach translates in practice to a call for science-based decision-making on questions of health and environmental risk, even in circumstances of scientific uncertainty. At the World Summit on Sustainable Development, the US and agricultural exporters like Australia<sup>54</sup> successfully argued for the inclusion of terminology in the Summit's *Plan of Implementation* which referred to need to promote and encourage 'science-based decision-making' and reaffirmed the 'precautionary approach'.<sup>55</sup>

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<sup>48</sup> This is an allegation stridently refuted by the EU: See European Commission, *Trade and Environment: What Europe Really Wants and Why* (2001) [3] <<http://europa.eu.int/comm/trade/miti/envir/doha.htm>> at 1 October 2004.

<sup>49</sup> *Marrakesh Agreement Establishing the World Trade Organization*, opened for signature 15 April 1994, 1867 UNTS 3 (entered into force 1 January 1995), annex 1A (*Agreement on the Application of Sanitary and Phytosanitary Measures*) 1867 UNTS 493 ('*SPS Agreement*').

<sup>50</sup> *Ibid* art 5.7.

<sup>51</sup> *Japan — Measures Affecting the Importation of Apples*, WTO Doc WT/DS245/AB/R, AB-2003-4 (2003) [48] (Report of the Appellate Body).

<sup>52</sup> *Ibid* [49]; see also *Japan — Measures Affecting the Importation of Apples*, WTO Doc WT/DS245/R (2003) [184] (Report of the Panel).

<sup>53</sup> Rhonda Piggott, 'Comments on the Paper Presented by Professor David Wirth' (Paper presented at The Precautionary Principle in Environmental Regulation: 10 Years Since *Leach*, Canberra, 20 November 2003) (copy on file with the author).

<sup>54</sup> Australia is often the spokesperson for a group of agricultural exporting countries known as the 'Cairns Group' which includes a number of countries from Latin American and Asia. See The Cairns Group <<http://www.cairnsgroup.org>> at 1 October 2004.

<sup>55</sup> See *Plan of Implementation of the World Summit on Sustainable Development, (Annex), Report of the World Summit on Sustainable Development*, 50, UN Doc A/CONF.199/20 (2002).

However, the *Plan of Implementation* goes on to quote the text of principle 15 of the *Rio Declaration* in full, leaving open the question of whether the international understanding of precaution is one which requires risk regulation to be purely science-based, or allows scope for a broader approach to questions of health and environmental risk.

#### IV PRECAUTION AS ‘PRUDENCE’

With countries unable to agree on the most appropriate regulatory approach when it comes to dealing with uncertain health and environmental risks, it is hardly surprising that disputes over risk regulation have made their way to international courts and tribunals. While such disputes frequently bring proponents of the precautionary principle into conflict with supporters of a precautionary approach, an apparent awareness of the political salience of this issue has made courts reluctant to tackle head on questions regarding the international legal status and meaning of precaution. Instead, international decision-makers in a number of tribunals have sought to fashion their own version of precaution as neither a principle nor an approach, but rather a notion based on prudence.

The idea of precaution as ‘prudence’ first emerged in the decision of the WTO Appellate Body in the high profile *Beef Hormones Appellate Body Report*. The arguments of the US and EC in this dispute directly raised questions concerning the international legal status of precaution and its formulation as either a general principle applicable in all cases of health or environmental risk, or simply an approach to decision-making manifested in different ways in different contexts. The Appellate Body, however, declined to rule on this aspect of the parties’ arguments, considering that it was ‘unnecessary, and probably imprudent ... to take a position on this important, but abstract question’.<sup>56</sup> It found that, regardless of the international status of precaution, the EC could not rely on the precautionary principle alone to justify measures that were otherwise inconsistent with the explicit requirements of the *SPS Agreement*.<sup>57</sup> Nevertheless, the Appellate Body went on to note ‘some aspects of the relationship of the precautionary principle to the *SPS Agreement*’, commenting that WTO decision-makers in any assessment of the scientific evidence underlying a regulatory measure should ‘bear in mind that responsible, representative governments commonly act from perspectives of *prudence and precaution* where risks of irreversible, e.g. life-terminating, damage to human health are concerned’.<sup>58</sup>

The language of precaution as ‘prudence’ has also been taken up by the International Tribunal for the Law of the Sea (‘ITLOS’) in two cases seeking provisional measures to prevent serious harm to the marine environment, prior to a trial of the merits by an arbitral tribunal.<sup>59</sup> In a case involving fishing quotas for the highly migratory species, the southern bluefin tuna, the precautionary

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<sup>56</sup> *Beef Hormones Appellate Body Report*, WTO Doc WT/DS26/AB/R, WT/DS48/AB/R, AB-1997-4 (1998) [123].

<sup>57</sup> *Ibid* [124]–[125].

<sup>58</sup> *Ibid* [124] (emphasis added).

<sup>59</sup> The Tribunal’s powers to issue provisional measures in a dispute under *UNCLOS* stem from *UNCLOS*, above n 35, art 290.

principle was argued by Australia and New Zealand as a basis for the order of provisional measures against Japan, to prevent the latter taking fish over its quota as part of an ‘experimental fishing program’.<sup>60</sup> In the view of Australia and New Zealand, gaps existed in scientific data concerning the species such that it was impossible to assess properly the true status of the stock and its level of recovery from previous overfishing.<sup>61</sup> The Japanese, on the other hand, maintained that there was no evidence of stock decline and that the best way of gaining a better knowledge of the status of the fishery was through undertaking an experimental fishing program.<sup>62</sup>

In its decision, ITLOS — like the WTO Appellate Body — avoided taking a stand on the question of the international legal status of precaution. Instead, faced with conflicting assessments of the available scientific data about an historically overfished species, it considered that the ‘the parties should in the circumstances act with *prudence and caution* to ensure that effective conservation measures are taken to prevent serious harm to the stock of southern bluefin tuna’.<sup>63</sup> Judge Laing noted that this rather cryptic statement partly evidenced the ‘adoption of the precautionary approach for the purposes of provisional measures in a case such as the present’.<sup>64</sup> He saw adopting an ‘approach’ rather than a ‘principle’ as significant in order to import ‘a certain degree of flexibility’ into the application of precaution.<sup>65</sup> Judge Treves took a slightly different view, seeing a ‘precautionary approach’ as

a logical consequence of the need to ensure that, when the arbitral tribunal decides on the merits, the factual situation has not changed. In other words, a precautionary approach seems to me inherent in the very notion of provisional measures.<sup>66</sup>

The language of ‘prudence and caution’ was again used by ITLOS in its recent decision regarding the issue of provisional measures in *The MOX Plant Case (Ireland v UK) (Provisional Measures)*.<sup>67</sup> Ireland had sought an order of provisional measures from the Tribunal to prevent the UK commissioning the MOX nuclear reprocessing plant at Sellafield, thereby increasing the risk of (further) radioactive pollution of the Irish Sea. Ireland contended that the precautionary principle, applied to the authorisation of the MOX plant and

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<sup>60</sup> See *Southern Bluefin Tuna Cases (New Zealand v Japan; Australia v Japan) (Provisional Measures)* ITLOS Case Nos 3 and 4 (Unreported, President Mensah; Vice-President Wolfrum; Judges Zhao, Caminos, Marotta Rangel, Yankov, Yamamoto, Kolodkin, Park, Bamela Engo, Nelson, Chandrasekhara Rao, Akl, Anderson, Vukas, Warioba, Laing, Treves, Marsit, Eiriksson and Ndiaye; Judge ad hoc Shearer, 27 August 1999) (Order) [72]–[73] (‘*Southern Bluefin Tuna Cases*’).

<sup>61</sup> *Ibid* [74].

<sup>62</sup> *Ibid* [73].

<sup>63</sup> *Ibid* [77] (emphasis added).

<sup>64</sup> *Southern Bluefin Tuna Cases (New Zealand v Japan; Australia v Japan) (Provisional Measures)* ITLOS Case Nos 3 and 4 (Separate Opinion of Judge Laing, 27 August 1999) [19].

<sup>65</sup> *Ibid*.

<sup>66</sup> *Southern Bluefin Tuna Cases (New Zealand v Japan; Australia v Japan) (Provisional Measures)* ITLOS Case Nos 3 and 4 (Separate Opinion of Judge Treves, 27 August 1999) [9].

<sup>67</sup> ITLOS Case No 10 (President Chandrasekhara Rao; Vice-President Nelson; Judges Caminos, Marotta Rangel, Yankov, Yamamoto, Kolodkin, Park, Bamela Engo, Mensah, Akl, Anderson, Vukas, Wolfrum, Treves, Marsit, Eiriksson, Ndiaye, Jesus and Xu; Judge ad hoc Székely; 3 December 2001) (Order) [84] (‘*MOX Plant Case*’).

international movements of radioactive materials associated with the plant, meant ‘that the United Kingdom must apply caution, and take preventive measures even where there is no conclusive evidence of a causal relationship between the inputs and the effects’.<sup>68</sup> ITLOS, however, found that the ‘urgency’ required for prescription of provisional measures was absent in this case given the short time expected until an arbitral tribunal could hear the merits of the dispute and in light of various undertakings given by the UK as to the transportation of radioactive materials by sea.<sup>69</sup> Nevertheless, ITLOS ruled that ‘prudence and caution’ required cooperation between Ireland and the UK in exchanging information about the risks or effects of operating the MOX plant.<sup>70</sup> This decision implied that while the uncertainties raised in the dispute were not so significant as to indicate that the prescription of provisional measures was required as a matter of urgency, considerations of ‘prudence and caution’ (precaution?) dictated a more cooperative approach on procedural matters than had been the case in the past.<sup>71</sup>

## V PRECAUTION AS PROCESS

As a compromise between two politically charged (if not ideologically laden) formulations of precaution, the notion of ‘precaution as prudence’ seems to offer a feasible solution when it comes to interpreting and applying precaution at the international level. The course of recent multilateral negotiations and interstate disputes has invested the labels ‘precautionary principle’ and ‘precautionary approach’ with particular political meanings which reflect fundamentally different attitudes and regulatory approaches to issues of health and environmental risk.<sup>72</sup> The international decisions invoking the alternative notion of precaution as a matter of prudence suggest a middle road where precaution both may be interpreted flexibly in a way that is sensitive to different

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<sup>68</sup> *MOX Plant Case* ITLOS Case No 10 (President Chandrasekhara Rao; Vice-President Nelson; Judges Caminos, Marotta Rangel, Yankov, Yamamoto, Kolodkin, Park, Bamela Engo, Mensah, Akl, Anderson, Vukas, Wolfrum, Treves, Marsit, Eiriksson, Ndiaye, Jesus and Xu; Judge ad hoc Székely; 3 December 2001) (Request for Provisional Measures and Statement of Case of Ireland) [101].

<sup>69</sup> *MOX Plant Case* ITLOS Case No 10 (President Chandrasekhara Rao; Vice-President Nelson; Judges Caminos, Marotta Rangel, Yankov, Yamamoto, Kolodkin, Park, Bamela Engo, Mensah, Akl, Anderson, Vukas, Wolfrum, Treves, Marsit, Eiriksson, Ndiaye, Jesus and Xu; Judge ad hoc Székely; 3 December 2001) (Order) [80]–[81].

<sup>70</sup> *Ibid* [84].

<sup>71</sup> *MOX Plant Case* ITLOS Case No 10 (Separate Opinion of Judge ad hoc Székely, 3 December 2001) [4].

<sup>72</sup> This is not to suggest that countries are always consistent in the approach taken for different risks as risk attitudes and approaches will vary with community perceptions of the ‘significance’ of particular threats. Australia, for example, takes a position in line with the precautionary principle in the fisheries area and some trade disputes regarding quarantine issues, but has been a strong supporter of the precautionary approach where its agricultural exports are potentially affected. Likewise the US has advocated precaution as at most an approach when it comes to the use of technologies like recombinant DNA techniques and hormone growth-promoters in agriculture, but takes a very conservative approach, more in line with the precautionary principle on issues like levels of pesticide residues on foods and the protection of endangered species. The ‘eclectic’ nature of both US and EU practice when it comes to regulating health and environmental risks has been highlighted by a number of authors from both sides of the Atlantic: See Löfstedt and Vogel, above n 18; and Jonathan Wiener, ‘Whose Precaution After All? A Comment on the Comparison and Evolution of Risk Regulatory Systems’ (2003) 13(3) *Duke Journal of Comparative and International Law* 207.

decision-making contexts, and yet still provide a basis for protective measures in some cases where scientific uncertainty exists. In cases such as the *Southern Bluefin Tuna Case* and the *MOX Plant Case*, international tribunals appear to have interpreted ‘prudence and precaution’ as requiring positive, protective measures to be taken in the face of scientific uncertainty.<sup>73</sup> In other cases — along the lines of the Appellate Body’s statement in the *Beef Hormones Appellate Body Report* — it seems that, in light of ‘prudence and precaution’, tribunals will recognise the authority (although not necessarily the duty) of responsible, democratic governments to take regulatory action to address health and environmental risks, particularly those which are life-threatening or irreversible.

Despite the advantages of a ‘precaution as prudence’ approach, this way of understanding the international meaning of precaution still suffers from a serious drawback. Formulated as a notion of ‘prudence’, precaution does not provide clear guidance for risk-related decision-making in circumstances of scientific uncertainty. In particular, without some idea of how considerations of ‘prudence and precaution’ influence the *process* of risk regulation there is a danger that prudence may be read as simply an affirmation of conventional practices of decision-making that do not adequately accommodate problems created by deficiencies in available scientific knowledge.<sup>74</sup> In the dispute over beef hormones, for example, the Panel, and subsequently the Appellate Body, insisted on a full risk assessment as a justification for the EC’s regulation of the new synthetic hormone melengestrol acetate (‘MGA’). This was despite the fact that the health risks of using the hormone as a growth promoter had not yet been examined by international scientific bodies, and that the only information available about the potential health effects of MGA was held by the US Food and Drug Administration and the companies producing the growth promoter.<sup>75</sup> In ruling that the EC had not undertaken an adequate risk assessment for MGA, the Appellate Body implicitly rejected the idea that ‘prudence and precaution’ might provide a basis for a government’s reliance upon less rigorous scientific evidence

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<sup>73</sup> In both cases, ITLOS prescribed proactive measures to be taken by the parties to address potential threats to the marine environment. See *MOX Plant Case* ITLOS Case No 10 (President Chandrasekhara Rao; Vice-President Nelson; Judges Caminos, Marotta Rangel, Yankov, Yamamoto, Kolodkin, Park, Bamela Engo, Mensah, Akl, Anderson, Vukas, Wolfrum, Treves, Marsit, Eiriksson, Ndiaye, Jesus and Xu; Judge ad hoc Székely; 3 December 2001) (Order) [89]; *Southern Bluefin Tuna Cases* ITLOS Case Nos 3 and 4 (Unreported, President Mensah; Vice-President Wolfrum; Judges Zhao, Caminos, Marotta Rangel, Yankov, Yamamoto, Kolodkin, Park, Bamela Engo, Nelson, Chandrasekhara Rao, Akl, Anderson, Vukas, Warrioba, Laing, Treves, Marsit, Eiriksson and Ndiaye; Judge ad hoc Shearer, 27 August 1999) (Order) [90].

<sup>74</sup> This has often been the experience in the Australian context where precaution is construed as ‘a statement of commonsense ... directed towards the prevention of serious or irreversible harm to the environment in situations of scientific uncertainty’: *Leach v National Parks and Wildlife Service and Shoalhaven City Council* (1993) 81 LGERA 270, 282. Much of the subsequent case law pays lip service to the idea of precaution as a matter of ‘commonsense’, but does not consider how scientific uncertainty impacts determinations about the potential for environmental impact from various human activities.

<sup>75</sup> *Beef Hormones Panel Report*, WTO Doc WT/DS26/R/USA (1997) [8.255]–[8.258]; *Beef Hormones Appellate Body Report*, WTO Doc WT/DS26/AB/R, WT/DS48/AB/R, AB-1997-4 (1998) [137].

in circumstances where (publicly available) scientific knowledge concerning a new substance is scarce.<sup>76</sup>

Rather than a general prescription of ‘prudence’, which risks different interpretations of precaution based primarily on decision-makers’ own prejudices and values when it comes to the threat at hand, providing an alternative, more effective international understanding of precaution requires being able to articulate what kind of regulatory or decision-making process is ‘prudent’ where scientific information does not provide conclusive answers on questions of risk. While the international notion of precaution should be sufficiently flexible to accommodate the variety of different health and environmental decision-making contexts encountered in practice, there is a need for greater constraints on decision-makers’ discretion than can be provided by notions of prudence or commonsense alone. In applying precaution, international decision-makers should be able to move flexibly between stricter and weaker versions of precautionary measures depending upon the extent of uncertainties encountered in the scientific evidence and the perceived seriousness of threatened harm, but they should do so within a particular procedural framework that ensures that decisions are taken in a way that is responsive to the problem of scientific uncertainty and is also cognisant of the multifaceted nature of health and environmental risk.

An essential element of a precautionary process, and one that can readily be derived from the variety of existing formulations of precaution in international settings, is the need to take account of scientific uncertainty in decision-making on questions of health or environmental risk.<sup>77</sup> Science in modern times has become an indispensable part of risk regulatory processes, but that does not mean that scientific information can be taken at face value when decisions are being made about measures to address risks. Scientific knowledge is affected by a range of different uncertainties that may stem from the limits of existing theories or research, as well as the accuracy or availability of appropriate methodologies.<sup>78</sup> Precaution, viewed in procedural terms, would require decision-makers dealing with issues of health or environmental risk regulation to approach scientific information proffered as a basis for decision-making with a critical eye. For example, in an environmental context such as fisheries management, predictions about stock levels and the impacts of fishing on the

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<sup>76</sup> The Panel’s decision seems to have been based on the assumption that the EC should have sought to justify its regulations for MGA as ‘provisional measures’ under art 5.7 of the *SPS Agreement*. In contrast, art 5.7 was not mentioned by the Appellate Body in the context of MGA. Instead it faulted the EC for only producing general evidence in respect of MGA which

did not include any study that demonstrated how closely related MGA is chemically and pharmacologically to other progestins and what effects MGA residues would actually have on human beings when such residues are ingested along with meat from cattle to which MGA has been administered for growth promotion purposes

*Beef Hormones Appellate Body Report*, WTO Doc WT/DS26/AB/R, WT/DS48/AB/R, AB-1997-4 (1998) [201].

<sup>77</sup> For a discussion of the various formulations of precaution in international law and their common elements, see James Cameron, ‘The Precautionary Principle’ in Gary Sampson and Bradnee Chambers (eds), *Trade, Environment, and the Millennium* (2<sup>nd</sup> ed, 2002) 287.

<sup>78</sup> See Vern Walker, ‘The Siren Songs of Science: Towards a Taxonomy of Scientific Uncertainty for Decisionmakers’ (1991) 23 *Connecticut Law Review* 567.

marine environment are often riddled with uncertainties because of a lack of information about the species concerned, as well as a paucity of 'baseline' data regarding indicators of environmental health. Scientific knowledge is often much more sophisticated when it comes to understanding health problems, like the cancer risk of consuming beef containing hormone residues. However, there is still the potential for uncertainties to be created through the use of assumptions — a necessary part of extrapolating experimental laboratory results to real life situations — or by accepting certain hypotheses of cause and effect which may be rejected in the future if contrary evidence emerges. Approaching scientific information with a critical eye requires decision-makers to seek to inform themselves about the potential for uncertainty in the materials placed before them and even to call for this information where it is not voluntarily provided.

Appreciation of the potential for scientific uncertainty allows decision-makers to adjust their assessment of the reliability of scientific information for the purposes of decision-making. In a context like that raised in the *Southern Bluefin Tuna Cases*, conflicting scientific assessments of the conservation status of a species (particularly one that was over-exploited in the past) might be taken as an indicator of genuine uncertainty regarding the impact of increased catches on the viability of the species, casting doubt on the accuracy of existing stock assessments. Likewise, a more critical approach to the scientific material put before decision-makers in a dispute such as the *Beef Hormones Appellate Body Report* might have allowed the Panel and Appellate Body, in looking at the EC's risk assessment for MGA in particular, to recognise the deficiencies in existing, publicly available information about this product. By turning their minds to such deficiencies, and their impact on the reliability of the material before them concerning MGA, the WTO decision-makers would have been forced to confront questions concerning the appropriateness of placing the burden on the EC to produce strong scientific evidence of a link between residues of MGA in beef and health effects in circumstances where the only studies of the risks posed by the new synthetic hormone were in the hands of the complainants.<sup>79</sup>

Adopting a more realistic approach when it comes to the utility of science for risk-related decision-making requires decision-makers to pay closer attention to other factors that enter the regulatory process where uncertainties arise. Without a sufficiently transparent decision-making process, subjective considerations that influence decision-making under uncertainty may pass undetected. Indeed, without paying attention to possible sources of uncertainty in the scientific material before them it may be difficult for international decision-makers to isolate the extent to which 'expert' evaluations of the extent of risk are

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<sup>79</sup> Placing the burden of proof on the party with the greatest access to relevant information concerning the risks at issue may be the most appropriate way to address information asymmetries created by a general lack of research and uncertainty. See Carl Cranor, 'Asymmetric Information, the Precautionary Principle, and Burdens of Proof' in Carolyn Raffensperger and Joel Tickner (eds), *Protecting Public Health and the Environment: Implementing the Precautionary Principle* (1999) 74.

themselves influenced by value judgements and subjective opinions.<sup>80</sup> By failing to acknowledge the important value component of decisions about acceptable levels of risks (particularly in the international arena where judgements about the ‘significance’ of health and environmental threats may differ strongly between — and within — countries as the result of differing social contexts) decision-makers may conceal the influence of subjective factors under the veil of ‘objective’ risk assessment. Moreover, as the ongoing MOX Plant dispute illustrates, scientific evaluations of risk are not the only factor influencing a community’s assessment of the seriousness of a potential threat. From the public’s perspective, more important considerations may include who benefits from a particular activity or technology, the degree of control members of the community have over accepting the risks involved and the level of trust reposed in regulators and those undertaking the activity.<sup>81</sup>

By drawing attention to the potential for uncertainties, and hence the inherently subjective nature of many judgments about potential harm, a precautionary process of decision-making can also turn the minds of decision-makers to consider questions concerning the different values that motivate conflicting regulatory approaches for technologies. In the GMO context, for example, it is clear that different philosophies underlie the regulatory approaches of the protagonists in the current US–EC dispute in the WTO. Whereas the US regulatory framework accepts that GMOs are ‘substantially equivalent’ to the conventional organisms from which they are derived, EU regulation of GM crops and foods is based on the premise that GMOs are different to non-GMOs, thus necessitating a more rigorous safety assessment, and one that takes into account non-scientific perspectives as well as scientific evaluations of risk.<sup>82</sup> Of course this kind of analysis raises broader issues (ones that cannot adequately be dealt with here) as to whether international law should be prescriptive when it comes to the risk regulatory systems that states adopt and the values that underlie them.<sup>83</sup>

Acknowledging the role that values and other subjective considerations may play in decision-making where scientific uncertainties arise also invites further questions about the viewpoints on risk issues to which decision-makers are exposed when they consider the need for risk regulatory measures. In democratic polities, whether national or transnational, there is usually some mechanism

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<sup>80</sup> There is now an extensive body of literature canvassing subjectivities in scientific research (see, eg, Sheila Jasanoff, *The Fifth Branch: Science Advisors as Policymakers* (1990)) and the impact of value judgments on risk assessment. In respect of the latter see especially National Research Council, *Risk Assessment in the Federal Government: Managing the Process* (1983); Paul Stern and Harvey Fineberg (eds), *Understanding Risk: Informing Decisions in a Democratic Society* (1996).

<sup>81</sup> For a discussion of factors affecting the public’s perception of risk, and the important role of trust, see Paul Slovic, *The Perception of Risk* (2000).

<sup>82</sup> David Vogel, ‘Ships Passing in the Night: The Changing Politics of Risk Regulation in Europe and the United States’ (Working Paper No 2001/16, Robert Schuman Centre for Advanced Studies, European University Institute, 2001).

<sup>83</sup> It is interesting to consider whether international human rights law might offer a model in this regard. Even rights considered by the international community to be ‘universal’ or ‘basic’, such as the right to a fair trial in criminal matters, need not be implemented or realised in identical ways in all countries. ‘Culturally influenced forms of implementation’ are permitted within a certain margin of appreciation: Henry Steiner and Phillip Alston, *International Human Rights in Context: Law, Politics, Morals* (2<sup>nd</sup> ed, 2000) 366.

available to decision-makers by which they can be informed about different risk perceptions that exist within the relevant community.<sup>84</sup> In the supranational context, where states (and technocratic advisors) are usually the most prominent actors,<sup>85</sup> significant challenges are faced in seeking to ensure that international decision-makers dealing with matters of risk regulation have access or exposure to a range of views that reflect those of different sectors of the international community. This problem may only be compounded when countries take their disputes over ways of dealing with controversial risk issues before international tribunals, which have limited competence and powers to ensure their decisions reflect widely held social values.<sup>86</sup>

## VI CONCLUSION

Barely a decade after the *Rio Declaration* famously called for precaution in states' response to matters of health and environmental risk, the concept is in danger of becoming bogged down in a legal quagmire of endless debate over its interpretation as a principle or as an approach. A textual analysis reveals little difference between precaution as a principle and precaution as an approach, with both terms used frequently, and sometimes together, in relevant international instruments. However, political differences over the significance of different technological risks have invested the principle–approach debate with new meaning — one which principally reflects different attitudes to risk rather than fundamentally different appreciations of the importance of taking scientific uncertainty into account in reaching decisions about health and environmental threats. International tribunals faced with questions over the interpretation of precaution have developed a compromise formulation of precaution as 'prudence' but, without clarification of the implications of 'prudence and precaution' for risk regulatory processes, this may do little to advance international understanding of how precaution is to be applied in risk-related decision-making.

The harsh reality of decision-making under conditions of scientific uncertainty is that judgments as to which risk regulatory approach was the right one can only be made in hindsight. Prescribing an inflexible rule for preventative measures to be taken in any circumstance of scientific uncertainty has the potential to block many technologies which may prove to be socially beneficial and generally safe in the future. But equally, insisting on a science-based decision-making approach to risk may encourage sources of uncertainty to be disregarded, or subjective factors entering the regulatory process to be concealed

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<sup>84</sup> Participatory mechanisms may include the publication of applications for approval of a technology, inviting comment from the public or allowing members of the public or community groups to contribute to, or challenge, the ultimate decision on an application.

<sup>85</sup> Indeed, some commentators see technocratic advisors and government officials as occupying an even more significant role than states in contemporary international law: See Anne-Marie Slaughter, *A New World Order* (2004) 219–21.

<sup>86</sup> One of the few mechanisms available for non-state actor participation in dispute settlement fora like the WTO is the provision for NGOs to submit unsolicited amicus curiae briefs to WTO Panels and the Appellate Body. For a discussion of this mechanism see Petros Mavroidis, 'Amicus Curiae Briefs Before the WTO: Much Ado about Nothing' in Armin von Bogdandy, Petros Mavroidis and Yves Mény (eds), *European Integration and International Co-ordination: Studies in Transnational Economic Law in Honour of Claus-Dieter Ehlermann* (2002) 317.

beneath a rhetoric of ‘objective’ science.<sup>87</sup> Precaution should not require decision-makers to achieve the impossible and reach the ‘right’ decision in advance, regardless of uncertainties. Rather, the best chance for the international community to prevent serious environmental degradation in the future lies in imposing particular procedural constraints on regulatory decision-making that are designed to ensure scientific uncertainty is factored into the process and that science itself is not extended beyond the limits of its utility and capacity to inform decisions on risk regulatory measures.

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<sup>87</sup> De Sadeleer, above n 16, 155.