Science, precautionary principle and the law in two recent judgments of the Court of Justice of the European Union on glyphosate and hunting management•

by Sara De Vido

Abstract: Scienza, principio di precauzione e diritto in due recenti sentenze della Corte di giustizia dell'Unione europea su glifosato e caccia di gestione – This article is aimed at assessing the interplay that exists, from a legal point of view, between the precautionary principle and science in front of the Court of Justice of the European Union with regard to two judgments concerning the use of glyphosate (*Blaise and others*) and the protection of animals under the 1992 Habitats Directive (*Tapiola*), both decided in October 2019. I will argue that the precautionary principle is more a political rather than a scientific principle that informs the activity of public authorities and that the CJEU – *mutatis mutandis*, potentially all courts – could examine its application through the lens of the *reasonableness* of the measures adopted by competent authorities.

Keywords: Precautionary principle, glyphosate, hunting management, science in international courts, biodiversity, protection of non-human animals, reasonableness.

For I wish to argue that the law - our profession, our art, our discipline, call it what you will - has grown out of touch with the scientific outlook that dominates our age, and that it must change its attitude so as to harmonise with that outlook if it wants to remain a living and respected force in contemporary society.

(P. Brett, *The Implications of Science for the Law*, in *Mc Gill Law Journal*, 18, 1972, 170)

1. Introduction and scope of the analysis

This article is aimed at assessing the interplay that exists, from a legal point of view, between the precautionary principle and science in front of the Court of Justice of the European Union (CJEU) with regard to two recent judgments concerning the use of glyphosate and the protection of animals under the 1992 Habitats Directive. I will argue that the precautionary principle is more a political rather than a scientific principle that informs the activity of public authorities and

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that the CJEU – *mutatis mutandis*, potentially all courts – could examine its application through the lens of the *reasonableness* of the measures adopted by competent authorities. The two cases under analysis, both adopted in October 2019, are particularly significant. The first one, *Blaise and Others*, on glyphosate, did not assess the validity of the decision that authorised the use of the substance in the EU, but rather of the general regulation which established the procedure to ban or authorise a certain substance[1]. To a certain extent, the judgment was 'limited' because it confirmed the validity of the general regulation but not of the specific measure on glyphosate, which was not put into question. In the second case, *Tapiola*, on the hunting management of wolves in Finland, the Court examined whether the Habitats Directive allowed this kind of measure to be adopted by a national authority with the declared purpose to fight against poaching[2]. In both cases, the Court applied the precautionary principle – in the *Tapiola* case, for the first time with regard to non-human animals – and used science to confirm a European Union act or to challenge a specific national decision. The article starts with some considerations on the definition of science and of precautionary principle. It then briefly explores how courts have used science in domestic and international proceedings, and it then analyses the approach of the CJEU, focusing on the judgments under analysis. It will then discuss how difficult it is for a court like the CJEU to apply science and the precautionary principle, without considering every situation of uncertainty as potential ground for the application of precaution, and how the use of the principle of *reasonableness* could be useful to *measure* its appropriate application.

2. Definitions: science and precaution

For the purpose of this article, science is meant as a 'process for proposing and refining theoretical explanations about the world that are subject to further testing and refinement'[3]. When science so defined (necessarily) enters the law,[4] as

[1] Judgment of the Court (Grand Chamber) of 1 October 2019, *Criminal proceedings against Mathieu Blaise and others*, Case C-616/17, ECLI:EU:C:2019:800.

[2] Judgment of the Court (Second Chamber) of 10 October 2019, *Luonnonsuojeluyhdistys Tapiola Pohjois-Savo — Kainuu ry*, Case C-674/17, ECLI:EU:C:2019:851.

[3] This definition was included in an *amicus curiae* brief submitted by the National Academy of Sciences and the American Association for the Advancement of Science to the Supreme Court in the Daubert case. *Daubert v. Merrell Dow Pharms.*, Inc., 509 U.S. 579 (1993).

[4] We will not discuss here whether or not law itself can be considered as science. See, in the sense that law is science, the famous work by N. Bobbio, *Scienza del diritto e analisi del linguaggio*, re-published in U. Scarpelli (ed.), *Diritto e analisi del linguaggio*, Milano, 1976, 287 ss. Bobbio clearly argued that 'il giurista, quando svolge la sua ricerca, fa della scienza nel senso proprio della parola' (*ivi*, 324), and referred to neo-positivism to stress that the truth must be considered in terms of accuracy, something that jurisprudence can achieve (*ivi*, 300). The debate has been intense in the US, where Langdell first introduced the concept of law as science at Harvard Law School in the late nineteenth century. In 1923, however, another American scholar pointed out that 'the law is not scientific' (W.G. Morse, *The Law as a Science*, in *Proceedings of the Academy of Political Science in the City of New York*, 10, 3, 1923, 59 ss., 62. 59-68). Almost ninety years after this affirmation, Nancy Cook made the argument that law is science if we consider the latter 'not as the discovery of fixed principles, but as rhetorical

it was argued by Stephen Breyer in the *Reference Manual for Scientific Evidence*, first published in 1994 by the US Federal Judicial Center, 'the upshot is that we must search for law that reflects an understanding of the relevant underlying science,' which does not mean a research for 'scientific precision,' but rather that 'the law must seek decisions that fall within the boundaries of scientifically sound knowledge'[5]. Every scholar is perfectly aware of the challenges posed by the notion of science itself, and it is not the purpose of this article to enter an endless debate on the matter. Relying on science must avoid two major risks: on one hand, the risk of introducing in the proceedings the so-called 'junk science,' which alters the reconstruction of the facts and manipulates evidentiary outcomes[6]; on the other hand, the risk of excluding new developments of science owing to the stringent rules of procedures applicable in court. The philosopher of science Karl Popper identified the requirements of the scientific status of a theory: its falsifiability, or refutability, or testability. He wrote the following:

> I shall not require of a scientific system that it shall be capable of being singled out, once and for all, in a positive sense; but I shall require that its logical form shall be such that it can be singled out, by means of empirical tests, in a negative sense: it must be possible for an empirical scientific system to be refuted by experience[7].

The International Court of Justice came close to a definition of science in the *Whaling Case, Australia v. Japan*[8], decided in 2014, which concerned the whaling programme *Jarpa II* launched by Japan for the declared purpose of scientific research. In the judgment, the Court argued that science is objective: 'whether the killing, taking and treating of whales pursuant to a requested special permit is for purposes of scientific research … cannot simply depend upon the State's perception'[9]. Despite not proposing any complete definition, the Court affirmed that 'the process of science is interwoven in the standard of review for comparing the objectives, design, and implementation of *Jarpa II*'[10].

The other concept which is relevant for the analysis is the one of 'precaution.' Commentators have extensively discussed the nature of the precaution as a principle, - and, if so, whether aspirational or binding rule, - or approach, or strategy[11]. Some authors are convinced that precaution has ripened into a norm of

invention and/or creative reconceptualization' (N. Cook, *Law as Science: Revisiting Langdell's Paradigm in the 21st Century*, in *North Dakota Law Review*, 88, 2012, 22 ss., 38).

[5] S. Breyer, *Introduction*, in *Reference Manual on Scientific Evidence*, Washington D.C., 3. ed., 2011, 4.

[6] Cfr. M. Mocchegiani, *Sapere scientifico e ruolo del giudice. Primi appunti*, in *Quaderni costituzionali*, 3, 2017, 571 ss., in part. 573.

[7] K. Popper, *The Logic of Scientific Discovery*, London, New York, 1959, 18.

[8] *Whaling in the Antarctic (Australia v. Japan: New Zealand intervening)*, Judgment, I.C.J. Reports 2014, 226.

[9] *Whaling in the Antarctic*, para. 61.

[10] M. Mangel, *Whales, science, and scientific whaling in the International Court of Justice*, in *PNAS*, 113/51, 2016, 14524.

[11] On the precautionary principle, see, *inter alia*, among hundreds of studies, J.E. Hickey Jr, V.R. Walker, *Refining the precautionary principle in international environmental law*, in *Virginia Environmental Law Journal*, 14(3), 1995, 423 ss.; D. Freestone, E. Hey (eds), *The Precautionary*

customary international law[12]. Others, however, prefer to use the concept as principle: '[i]f the precautionary principle is viewed not as a customary law rule but simply as a general principle then its use by national and international courts and by international organisations is easier to explain'[13]. Precaution must be surely appreciated as 'one of the central concepts for organizing, influencing and explaining contemporary international environmental law and policy'[14].

As it is well-known, the principle was created in national law: the German *Vorsorgeprinzip* dates back to 1972 when it was incorporated in the *Immissionsschutzgesetz* (Federal Emission Control Act). At the international level,

Principle and International Law: The challenge of implementation, The Hague, London, Boston, 1996; J. Cameron, *The precautionary principle: Core meaning, constitutional framework and procedures for implementation*, in R. Harding and E. Fisher (eds.), *Perspectives on the Precautionary Principle*, Leichhardt, New South Wales, 1999, 29 ss.; T. O'Riordan, J. Cameron and A. Jordan (eds.), *Re-Interpreting the Precautionary Principle*, London, 2001; J. Cameron and J. Abouchar, *The precautionary principle: A fundamental principle of law and policy for the protection of the global environment*, in *Boston College International and Comparative Law Review*, 14, 1991, 1 ss.; D. Freestone and E. Hey (eds.), *The Precautionary Principle and International Law: The challenge of implementation*, The Hague; London; Boston, 1996; E. Fisher, *Is the precautionary principle justiciable?*, in *Journal of Environmental Law*, 2001, 13 (3), 315 ss.; P. Harremoes, D. Gee, M. MacGarvinet al. (eds.), *The Precautionary Principle in the 20th Century: Late lessons from early warnings*, London, Sterling, 2002; A. Trouwborst, *Evolution and Status of the Precautionary Principle in International Law*, The Hague, London, Boston, 2002; L. Boisson de Chazournes, *Le principe de précaution: nature, contenu et limites*, in C. Leben, J. Verhoeven, *Le principe de précaution. Aspects de droit international et communautaire*, Paris, 2002, 65 ss.; G.E. Marchant, K.L. Mossman, *Arbitrary and capricious: the precautionary principle in the European Union courts*, Washington, 2004; L. Marini, *Il principio di precauzione nel diritto internazionale e comunitario*, Padova, 2004; E. Fisher, J. Jones and R. von Schomberg (eds.), Implementing the Precautionary Principle: Perspectives and prospects, Cheltenham, UK; Northampton, MA, 2006; F. Bassan, *Gli obblighi di precauzione nel diritto internazionale*, Napoli, 2006; L. Butti, *Principio di precauzione, Codice dell'Ambiente e giurisprudenza delle Corti comunitarie e della Corte costituzionale*, in *Riv. giur. ambiente*, 2006, 6, 809 ss.; A. Bianchi, M. Gestri (eds), *Il principio di precauzione nel diritto internazionale e comunitario*, Milano, 2006; J.B. Wiener, *Precaution*, in D. Bodansky, Brunnée, E. Hey (eds), *The Oxford Handbook of International Environmental Law*, Oxford, 2007, 597 ss.; A. Stirling, *Risk, precaution and science: towards a more constructive policy debate, EMBO reports*, 2007, 8(4), 309 ss.; A. Fodella, L. Pineschi, *La protezione dell'ambiente nel diritto internazionale*, Torino, 2009; J. Zander, *The application of the precautionary principle in practice: comparative dimensions*, Cambridge, 2010; C.E. Foster, *Science and the Precautionary Principle in International Courts and Tribunals*, Cambridge, 2011; D. Vogel, *The Politics of Precaution: Regulating Health, safety, and environmental risks in Europe and the United States*, Princeton, 2015; A. Proelss, *Principles of EU Environmental Law: An Appraisal*, in Y. Nakanishi (ed.), *Contemporary Issues in environmental law. The EU and Japan*, Tokyo, 2016, 29 ss.; R. Rayfuse, *Precaution and Climate Change: What Role for the Precautionary Principle in Addressing Global Warming*, in A. Proelss (ed.), *Protecting the Environment for Future Generations, Berlin*, 2017, 61 ss.

[12] A Trouwborst, *Evolution and Status of the Precautionary*, cit., 284.

[13] A. Boyle, *The Environmental Jurisprudence of the International Tribunal for the Law of the Sea*, in *The International Journal of Marine and Coastal Law*, 2007, 22(3), 375. Referring to a "still evolving principle of environmental protection", J. Crawford, *Brownlie's Principles of Public International Law*, Cambridge, 2012, 357.

[14] P. Birne, A. Boyle, C. Redgwell, *International Law and the Environment*, Oxford, 2009, 147. See also D. Bodansky, *The Art and Craft of International Environmental Law*, Cambridge, MA, 2010, 200: "[principles] articulate collective aspirations that play an important role over the longer term, framing both discussions about the development of international law and negotiations to develop more precise norms."

the precautionary principle was first endorsed in the 1982 UN Charter for Nature, and later codified in Principle 15 of the 1992 Rio Declaration[15]:

> 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[16].

The United Nations Convention on Biological Diversity, adopted in 1992, encapsulates the precautionary principle, without directly naming it, in its preamble: 'Noting also that where there is a threat of significant reduction or loss of biological diversity, lack of full scientific certainty should not be used as a reason for postponing measures to avoid or minimize such a threat.' Article 3(3) of the 1992 United Nations Framework Convention on Climate Change required States, among the principles, to 'take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects.'

Similarly, in 2000, States parties to the Convention on Biological Diversity agreed on the Cartagena Protocol on Biosafety; according to its provisions, States can refuse imports of modified organisms where scientific certainty is lacking, in order to avoid or minimise their adverse effects. The precautionary principle was invoked before the International Court of Justice by Hungary in the *Gabcikovo-Nagymaros* case[17], but not further discussed in the merits by judges. As far as the law of the sea is concerned, first the International Tribunal on the Law of the Sea (ITLOS), in its judgment on *Southern Bluefin Tuna*, posited that the parties should act 'with prudence and caution to ensure that effective conservation measures are taken to prevent serious harm to the stock of Southern Bluefin tuna'[18], and some years later, in its Advisory Opinion, the Seabed Chamber of the same tribunal was more explicit in affirming that the precautionary approach was an obligation of States sponsoring activities in the Area[19].

At the regional, European, level, the precautionary principle was first added in Art. 130 r, para. 2, of the EC Treaty with the Treaty of Maastricht, then defined by the CJEU as a 'fundamental principle of environmental law'[20], and eventually clearly enshrined in Art. 191 (2) TFEU:

[15] O. McIntyre, T. Mosedale, *The Precautionary principle as a norm of customary international law*, in *Journal of Environmental Law*, 1997, 9, 221 ss.; A. Fodella, *I principi generali*, in Fodella, Pineschi (eds), *op. cit.*, 106-107.
[16] Report of the UN Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992, A/CONF.151/26 (Vol. I), 12 August 1992.
[17] *Gabčikovo-Nagymaros Project (Hungary/Slovakia)*, Judgment, I. C. J. Reports 1997, 7, para. 97.
[18] *Southern Bluefin Tuna Cases, New Zealand and Australia v. Japan*, ITLOS, order of 27 August 1999 (provisional measures), para. 77. See also Judge Treves, concurring opinion, para. 8: 'the Tribunal must assess the urgency of the prescription of its measures in light of prudence and caution. This approach, which may be called precautionary, is hinted at in the order [...] it would seem to me that the requirement of urgency is satisfied only in the light of such precautionary approach'.
[19] ITLOS, Advisory opinion, paras. 125-135.
[20] ECJ, *Commission v. France*, C-121/07, judgment of 9 December 2008, 2008 I-09159.

> Community policy on the environment shall aim at high level of protection taking into account the diversity of situations in the various regions of the Community. It shall be based on the precautionary principle [...].

Despite being only mentioned as an environmental law principle, the precautionary principle has a wider scope, as acknowledged by the European Commission in its 2000 Communication on the precautionary principle:

> The precautionary principle is not defined in the Treaty, which prescribes it only once – to protect the environment. But *in practice* its scope is much wider, and specifically where preliminary objective scientific evaluation, indicates that there are reasonable grounds for concern that the potentially dangerous effects on the *environment*, *human*, *animal or plant health* may be inconsistent with the high level of protection chosen for the Community[21].

Precaution is defined as a 'risk management strategy' applicable when 'there are reasonable grounds for concern that potential hazards may affect the environment or human, animal or plant health, and when at the same time the available data preclude a detailed risk evaluation'[22]. The two interrelated aspects of the precautionary principle as identified by the Commission are the following: a. 'the political decision to act or not to act as such, which is linked to the factors triggering recourse to the precautionary principle;' and b. in the affirmative, how to act, i.e. the measures resulting from application of the precautionary principle[23]. Following the definition of the Commission, the precautionary principle is relevant when there is a potential risk which cannot be fully demonstrated or quantified or whose effects cannot be determined. The application of the precautionary principle depends on the 'identification of potentially negative effects' and on the scientific evaluation of the potential adverse effects[24]. The European Environment Agency provided a working definition of precaution in its *Late Lessons from Early Warnings II - Science, Precaution and Innovation:*

> The precautionary principle provides justification for public policy and other actions in situations of scientific complexity, uncertainty and ignorance, where there may be a need to act in order to avoid, or reduce, potentially serious or irreversible threats to health and/or the environment, using an appropriate strength of scientific evidence, and taking into account the pros and cons of action and inaction and their distribution[25].

3. The relevance of science in court: a concise overview

The world is rapidly changing. So is law. The use of forensic science and DNA evidence have become very common in criminal proceedings, and new developments in genetics, neuroscience and material sciences 'are entering the

[21] Communication from the European Commission on the precautionary principle (COM(*2000*) 1 final of 2 February *2000*).
[22] Communication of the Commission, 8.
[23] Communication of the Commission, 12.
[24] Communication of the Commission, 13.
[25] *Late lessons from early warnings II: science, precaution and innovation* (*EEA* Report, 1/2013).

legal discourse'[26]. The purpose of this article is not to delve into the way domestic courts use science in criminal or civil proceedings brought before them[27]. A premise, however, which also touches upon the application of science in domestic proceedings, seems fundamental. Science, it was argued, 'cannot speak for itself to a legal factfinder,' and when it is presented in court, judges must be persuaded that 'science's findings relate truthfully and reliably to the events, actions, intentions and consequences that are the subject matter of adjudication'[28]. Expert witness might play a fundamental role in a proceeding, because they offer specialised testimony to facilitate a court's determination of scientific or technical facts. What happens when science evolves, when new findings might change – say – the level of risk attached to a certain product or procedure?[29] What if a substance that had been considered safe turns out to be potentially dangerous for human health? And, most importantly, how can judges grasp this change?

In order to understand whether scientific evidence is reliable, courts have elaborated criteria which might be source of inspiration for the work of international and regional courts. Hence, for example, in the US, departing from a previous jurisprudence based on the 'general acceptance theory'[30], courts contended, in the ground-breaking *Daubert* case decided by the US Supreme Court in 1993[31], that it should be assessed whether the claim has been tested, whether it was peer-reviewed, whether an error rate has been determined and whether the underlying science has won general acceptance[32].

Environmental cases also need science. As Dinah Shelton acknowledged:

> Scientific evidence is necessary to evaluate risks to the environment or natural resources. It is also important to cases alleging injury from pollution, and when environmental regulations are challenged as either a disproportionate infringement of rights or, in the international arena, as a disguised restriction on trade. Environmental science helps determine the causal links between the activities and the impacts, giving courts a set of data on which to base decisions about whether or not a proper balance of interests

[26] S. Seidman Diamond and R.O. Lempert, *When Law Calls, Does Science Answer? A Survey of Distinguished Scientists & Engineers*, in *Dœdalus, The Journal of the American Academy of Art & Science*, 2018, 42.

[27] On expert evidence in court, see, extensively, D. Dwyer, *The Judicial Assessment of Expert Evidence*, Cambridge, 2008. With regard to the use of science in front of the Italian Constitutional Court, M. Cartabia, *Qualche riflessione di un giudice costituzionale intorno al problema dell'intreccio tra diritto, scienza e tecnologia*, in *Biolaw Journal*, 2017, 9 ss. Comparing the jurisprudence of the Constitutional Court and the European Court of Human Rights, see G. Ragone, *Valutazioni e fatti scientifici tra ragionevolezza e proporzionalità: brevi note sul ragionamento giuridico della Corte costituzionale e della Corte europea dei diritti dell'uomo*, in M. D'Amico, F. Biondi (eds), *La Corte costituzionale e i fatti: istruttoria ed effetti delle decisioni*, Napoli, 2018, 285 ss.

[28] S. Jasanoff, *Science, Common Sense & Judicial Power in US Courts*, in *Dœdalus, The Journal of the American Academy of Art & Science*, 2018, 16.

[29] M. Tallachini, *EpiChange: Scienza e diritto in tribunale*, in *Epidemiol Prev* 2014, 38 (3-4), 159 ss.

[30] *Frye v. United States*, 293 F. 1013 (DC Cir. 1923).

[31] *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 US 579 (1993).

[32] Jasanoff, *op. cit.*, 17. On science in US courts, see the Supreme Court's *Daubert* trilogy analysed in C. Cranor, *Toxic Torts: Science, Law and the Possibility of Justice*, Cambridge, 2006, in particular the chapter on science and law in conflict.

> has been made. The substance of environmental rights involves evaluating ecological systems, determining the impacts that can be tolerated and what is needed to maintain and protect the natural base on which life depends. Environmental quality standards, precaution, and principles of sustainability can establish the limits of environmental decision making and continue to give specific content to environmental rights in law[33].

At the international level, in the *Gabčíkovo-Nagymaros (Hungary v. Slovakia)*[34] and in the *Pulp Mills (Argentina v. Uruguay)*[35] cases, scientific experts[36] acted as counsel, and were not subject to cross-examination by the Court in the Hague. In the first case, the parties included 'an impressive amount of scientific material' to support their arguments, to which the International Court of Justice gave 'most careful attention' to conclude that 'it is not necessary in order to respond to the questions put to it in the Special Agreement for it to determine which of those points of view is scientifically better founded'[37]. In his separate opinion, Judge Weeramantry stressed the shortcomings of a pure *inter partes* adversarial procedures, when it comes to cases of environmental danger, and emphasised the importance of science, by arguing that environmental law is a 'vital branch of law,' which needs 'all the insights available from the human experience, crossing cultural and disciplinary boundaries which have traditionally hemmed in the discipline of international law'[38]. In *Pulp Mills*, the International Court of Justice dedicated a part of its legal reasoning to the issue of expert evidence, given the fact that both parties, Argentina and Uruguay, presented factual and scientific material in support of their respective claims[39]. The Court also observed that the experts could have been presented by the parties as expert witnesses under Articles 57 and 64 of the *Rules of Court*, instead of being appointed as mere counsels

[33] D. Shelton, *Complexities and Uncertainties in Matters of Human Rights and the Environment: Identifying the Judicial Role*, in J.H. Knox, R. Pejan (eds), *The Human Right to a Healthy Environment*, Cambridge, 2018, 106.

[34] The case originated from a dispute between Hungary and Slovakia on the construction programme on the Danube aimed at producing hydroelectricity, pursuant to an agreement of 1977. Hungary contended that there were ecological risks in continuing the project and suspended the implementation. For my purposes, it is relevant to note that the Court did not rely on the precautionary principle – which was invoked by Hungary – to support its argument on ecological necessity. On the case, see, extensively, S. Forlati, M. Moïse Mbengue, B. McGarry (eds), *The Gabčíkovo-Nagymaros Judgment and Its Contribution to the Development of International Law*, Leiden, Boston, 2020.

[35] Argentina argued that Uruguay violated the Statute of the River Uruguay signed in 1975 by authorising, constructing and commissioning two pulp mills which the applicant considered as having detrimental effects on the quality of the waters of the rivers. See, *inter alia*, C. R. Payne, *Pulp Mills on the River Uruguay: The International Court of Justice Recognizes Environmental Impact Assessment as a Duty Under International Law*, in *ASIL Insights*, 14, 2010; P. Merkouris, *Case Concerning Pulp Mills on the River Uruguay (Argentina v. Uruguay): Of Environmental Impact Assessments and 'Phantom Experts'*, in *The Hague Justice Portal*, 2010; D. Carreau, F. Marrella, *Droit international*, Paris, 2018, 386.

[36] Four scientists were appointed as advocates by Hungary, two scientists as 'counsels and experts' by Slovakia. In the Pulp Mills, both parties appointed six delegation members as 'scientific advisors and experts'.

[37] *Gabčikovo-Nagymaros*, para. 54.

[38] Separate opinion Judge Weeramantry, 118-119.

[39] *Pulp Mills*, para. 165.

in the delegations. The defence counsels of both parties included the experts as counsel in their respective delegations[40]. The International Court of Justice contended that 'those persons who provide evidence before the Court based on their scientific or technical knowledge and on their personal experience should testify before the Court as experts, witnesses or in some cases in both capacities, rather than counsel, so that they may be submitted to questioning by the other party as well as by the Court.' As for the independence of the experts summoned in court and the use of scientific evidence, the Court explained that:

> It [did] not find it necessary in order to adjudicate the present case to enter into a general discussion on the relative merits, reliability and authority of the documents and studies prepared by the experts and consultants of the Parties. It needs only to be mindful of the fact that, despite the volume and complexity of the factual information submitted to it, it is the responsibility of the Court, after having given careful consideration to all the evidence placed before it by the Parties, to determine which facts must be considered relevant, to assess their probative value, and to draw conclusions from them as appropriate. Thus, in keeping with its practice, the Court will make its own determination of the facts, on the basis of the evidence presented to it, and then it will apply the relevant rules of international law to those facts which it has found to have existed[41].

Hence, the Court confirmed to have the competence to appreciate the value of the facts as presented by the parties, without entering any general discussion on the reliability of scientific resources. Two judges, Al-Khasawneh and Simma, did not agree with this affirmation, and contended in their joint dissenting opinion that:

> the exceptionally fact-intensive case before us is unlike most cases submitted to the Court and raises serious questions as to the role that scientific evidence can play in an international judicial institution. The traditional methods of evaluating evidence are deficient in assessing the relevance of such complex, technical and scientific facts[42].

They considered the Court 'not in a position adequately to assess and weigh complex scientific evidence of the type presented by the Parties,' and objected the 'method' that was used by the majority of judges[43]. According to the dissenting judges, the Court could have asked the parties to produce evidence or explanations or triggered Article 50 of its Statute, requesting outside sources of expertise in handling complex scientific or technical disputes[44].

In the *Whaling in the Antarctic case (Australia v. Japan)*[45], the first case in which scientific experts were cross-examined, the Court demonstrated, as Philippe Sands

[40] *Ivi*, para. 167.
[41] *Pulp Mills*, para. 168.
[42] Dissenting opinion of Judges Khasawneh and Simma, para. 3.
[43] *Ivi*, para. 5.
[44] *Ivi*, para. 7-8.
[45] *Whaling in the Antarctic (Australia v. Japan: New Zealand intervening)*, Judgment, I.C.J. Reports 2014, 226. The question that was asked to the Court was whether Japan violated the *International Whaling Convention* of 1946 by pursuing the *Jarpa II plan*, which authorised whaling for purpose of scientific research. The Convention, which is aimed at regulating, not

argued, to have 'a potentially significant role to play in assisting in the resolution of legal disputes that involve competing contentions as to matters of facts, including scientific facts'[46]. The International Court of Justice relied on the experts, but 'did not give *carte blanche* acceptance of expert opinion' and provided 'a number of general lessons about science and law'[47].

Science is required to analyse the effects of human activities on the environment and to prevent – through measures of preventive or precautionary nature – the commission of long-lasting and irreversible harm. Data science is also relevant to provide new insight into existing theories and to offer judges and scholars 'a different lens of analysis'[48]. Even though law itself might be considered as science[49], it is not thus straightforward that every judge possesses the extra-legal knowledge that is necessary to read data or to appreciate the reliability of one scientist instead of the other. Courts that do not specialise in environmental law, for example, 'have struggled to apply novel legal concepts embedded in bespoke environmental law regimes, such as environmental impact assessment,' and owing to issues related to scientific knowledge, 'establishing the facts on traditional rules of evidence [...] has been difficult'[50]. It is even more difficult when it comes to apply precaution and other environmental principles, whose content and legal nature are particularly difficult to grasp[51]. Caroline Foster contended in her book on science and the precautionary principle that where there is scientific uncertainty, 'mixed questions of fact and law' emerge; they include 'tests governing how states should act in situations of incomplete scientific knowledge, for example by requiring them to act only in ways that are reasonable, necessary or proportionate, or to co-operate appropriately with one another'[52].

4. The relevance of science and the precautionary principle in the Court of Justice of the European Union jurisprudence

The Courts in Luxembourg have applied the precautionary principle in preliminary rulings on the interpretation and the validity of EU law. Owing to the characteristics of the adjudicatory procedure, the application of the precautionary principle has been based on scientific findings conducted by other institutions, usually the Council and the European Commission. As it was argued by Caroline Foster, 'generally, scientific disputes within the European Union are much less

prohibiting, whaling, allows States to invoke exceptions for purposes of scientific research. The International Court of Justice concluded that the issuance of whaling permits involving the use of lethal methods 'did not comply with the scientific research requirement.'

[46] P. Sands, *Climate Change and the Rule of Law: Adjudicating the Future in International Law*, in *Journal of Environmental Law*, 2016, 28, 30.

[47] M. Mangel, *Whales, science, and scientific whaling in the International Court of Justice*, in *Proceedings of the National Academy of Sciences*, 2016, 113(51), 14526.

[48] D. Charlotin, *Identifying the Voices of Unseen Actors in Investor-State Dispute Settlement*, in F. Baetens (ed.), *Legitimacy of Unseen Actors in International Adjudication*, Cambridge, 2019, 392.

[49] See, above, note 4.

[50] E. Fisher, B. Lange, E. Scotford, *Environmental Law*, Oxford, 2019, 2.ed, 185.

[51] Shelton, *op. cit.*, 98.

[52] Foster, *Science and the precautionary principle*, cit.,138.

likely to give rise to mixed questions of fact and law than in international law,' because the European Union institutions have the competence to adopt preventive or precautionary measures as political decisions, without waiting 'for the reality and seriousness of risks to become apparent'[53]. The CJEU and the General Court (previously, Court of first instance) might be – and they were – asked to pronounce on scientific matters, to interpret European norms adopted by the Parliament and the Council and to decide on the validity of a European Union act. By doing so, Courts are required to apply environmental principles, even without having a specific expertise in that respect. The precautionary principle is binding for EU institutions; it can be either permissive or obligatory in nature[54]. Two authors, Garnett and Parsons, investigated how the precautionary principle has been applied in practice by the European Union in a selection of cases and pieces of legislation[55]. Their assessment was based on three attributes, namely the severity of potential harm, the degree of epistemic uncertainty, and the precautionary measures taken[56]. In a continuum between weak and strong precaution, the authors argued that weak precaution means that 'uncertainty does not justify inaction' and therefore that regulation is permitted (though banning is very rare); moderate precaution is described as 'uncertainty [which] justifies action,' where there are potentially dangerous effects, and regulatory standards are envisaged, included banning as last resort; strong precaution entails the shifting of the burden of proof to the proponent of an activity, who must demonstrate it is safe, and banning[57]. In terms of the relevance of science for the characterisation of the risk, the CJEU decided, in a case concerning preservatives and salt in food, that 'the risk must be measured, not according to the yardstick of general conjecture, but on the basis of relevant scientific research'[58]. The threshold of the risk – or, better, the uncertainty of the risk[59] – is interpreted by the CJEU and depends on the legislation invoked in the proceedings[60]. Another author concluded that European Courts are more comfortable with some criteria – for example that precautionary actions should be proportionate – than others – such as that precautionary actions

[53] Foster, *Science and the precautionary principle*, cit., 24. See also Judgment of the Court of 5 May 1998, *UK v. Commission*, ECLI:EU:C:1998:192, para. 99: '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.'
[54] J. Scott, *The Precautionary Principle before EU Courts*, in R. Macrory (ed.), *Principles of European Environmental Law*, Groningen, 2004, 54 ss.; M. Haritz, *An Inconvenient Deliberation: The Precautionary Principle's Contribution to the Uncertainties Surrounding Climate Change Litigation*, Alphen aan den Rijn, 2011, 95.
[55] K. Garnett, D.J. Parsons, *Multi-Case Review of the Application of the Precautionary Principle in European Union Law and Case Law*, in *Risk Analysis*, 37(3), 2017, 502.
[56] *Ivi*, 505. Four judgments that were analysed by the two scholars were assessed to be weak applications, whereas another one weak-to-moderate (the one on bovine spongiform encephalopathy BSE with a strong risk for public health).
[57] *Ivi*, 506.
[58] Judgment of the Court (Fifth Chamber) of 14 July 1994, *Criminal proceedings against J.J.J. Van der Veldt*, Case C-17/93, para. 17.
[59] M.B.A. van Asselt, E. Vos, *The Precautionary Principle and the Uncertainty Paradox*, in *Journal of Risk Research*, 9, 2006, 313 ss.
[60] J. Scott, *Legal Aspects of the Precautionary Principle*, in *The British Academy Briefing*, 2018, 10.

must be subject to review in light of scientific data[61]. They are, in other words, more 'comfortable' with well-established principles than with the evolution of science which might be difficult to be fully appreciated from a legal point of view. The complexity of the challenge faced by courts dealing with environmental and food safety matters is well represented in the *Pfizer Animal Health SA* case, concerning the transfer of resistance to antibiotics from animals to humans[62]. Science played a key role in the decision of the Court of First Instance, which acknowledged how 'the possibility and the probability of such transfer and the *risk* which it may entail for public health continue to give rise to argument in scientific circles'[63], and observed that all the bodies that dealt with the issues confirmed the need for further research on the matter. The contested EU provision withdrew the authorisation of virginiamycin as an additive in feeding stuffs, a decision to which *Pfizer Animal Health* objected. The Court applied the precautionary principle in one of its first pioneering judgments. It argued that 'where there is scientific uncertainty as to the existence or extent of risks to human health, the Community institutions may, by reason of the precautionary principle, take protective measures without having to wait until the reality and seriousness of those risks become fully apparent'[64]. The Court explained that it cannot take 'a purely hypothetical approach to risk,' but that, since the Treaty requires to ensure the 'high level of human health protection,' this level 'does not necessarily have to be the highest that is technically possible'[65]. It was argued that, 'as this reference to hypothetical risks suggests, the Court of Justice of the EU places science at the heart of its interpretation of the precautionary principle'[66]. The legality of the EU's prohibition of antibiotics was confirmed by the Court, despite disagreement on the existence of the risk. The Court contended that 'the level of risk deemed unacceptable will depend on the assessment made by the *competent public authority* of the particular circumstances of each individual case'[67]. Concerning the burden of proof, the Court contended that Pfizer was 'wrong to criticise the Community institutions for failing, in the risk assessment carried out during the procedure culminating in adoption of the contested regulation, to produce proof of the reality or the seriousness of the risks to human health associated with the use of virginiamycin as a growth promoter'[68], and that the Community institutions only needed to show that the contested regulation was adopted 'following as thorough

[61] M.D. Rogers, *Risk Management and the Record of the Precautionary Principle in EU Case Law*, in *Journal of Risk Research*, 2011, 14(4), 467 ss. See also R. Lofstedt, *The Precautionary Principle in the European Union: Why a Formal Review is Long Overdue*, in *Risk Management*, 2014, 16(3), 137 ss.

[62] Judgment of the Court of First Instance (Third Chamber), 11 September 2002, *Pfizer Animal Health v. Council of the European Union*, Case T-13/99. ECLI:EU:T:2002:209.

[63] *Pfizer Animal Health*, para. 36. Emphasis added. A comment on the judgment in A. Alemanno, *Protection des consommateurs: Arrêts Alpharma/Pfizer*, in *Revue de l'Union européenne*, 4/02, 842 ss., and van Asselt and Vos, *op. cit.*

[64] *Pfizer Animal Health*, para. 139.

[65] *Ivi*, para. 152.

[66] Scott, *Legal Aspects*, 11.

[67] *Pfizer Animal Health*, para. 153. See also Scott, *Legal Aspects*, cit., 10.

[68] *Ivi*, para. 164.

a scientific risk assessment as possible, which took account of the particular circumstances of the present case'[69]. In particular, under the precautionary principle, the Community institutions are entitled, in the interests of human health, to adopt, on the basis of an incomplete scientific knowledge, protective measures which may seriously harm legally protected positions, and they enjoy a broad discretion in that regard[70]. To support its argument, however, the Court only relied on the opinion by the Scientific Committee for Animal Nutrition ('SCAN') appointed by the Commission and composed of experts, which concluded that the use of virginiamycin did not constitute an immediate risk to public health in Denmark, though using 'the language of uncertainty' throughout the text. In other words, SCAN 'implicitly argued that there is an uncertain risk, but it does not constitute an immediate hazard, because any hazard that may be associated with virginiamycin is under control'[71]. Relying on the uncertainty expressed by SCAN, the European institutions prohibited the antibiotics and the Court confirmed their decision, dismissing the applicant's complaint. *Pfizer Animal Health SA* specified a procedure for evaluating scientific evidence in law making and defined the evidentiary threshold of 'hypothetical risk' applicable to precaution, which was summarised as follows:

1. The Court acknowledged the validity of measures based on the precautionary approach as a response to scientific uncertainty relating to human health;
2. The preventative measures while 'not fully demonstrated by conclusive science' must be adequately supported by available scientific data;
3. The risk, based not on mere hypothesis nor requiring scientific confirmation, must be assessed by the public authority based on the specific circumstances and taking into account the possible adverse impacts, available remedies and available scientific data;
4. The Court reaffirmed the importance of deference to the public authority, in the sense when scientific uncertainty or inability to conduct a risk assessment persists, this situation does not prevent the public authority to take preventive measures[72].

In the *Pfizer* case, the cost and benefit analysis, which should characterise the precautionary measure, was raised but then it was simply downgraded to some general considerations on proportionality[73]. Even though the Court contended that it could only provide a limited review, because the final decision was up to the domestic institutions, '[it] could not avoid discussing scientific validity and the merits of the scientific arguments raised by both parties,' in particular the link between the use of virginiamycin as an additive in feeding-stuffs and the

[69] *Ivi*, para. 165.
[70] *Ivi*, para. 170.
[71] van Asselt and Vos, *op. cit.*, 321.
[72] M.-C. Cordonier Segger, H.E. Judge C.G. Weeramantry, *Sustainable development principles in the decisions of international courts and tribunals 1992-2012*, London, 611.
[73] Rogers, *op. cit.*, 478.

development of streptogramin resistance in humans[74]. The two authors demonstrated what they called 'the uncertainty paradox:' while on one hand great uncertainty is emphasised, on the other hand, it is suggested that sufficiently reliable and cogent scientific evidence and a proper scientific basis were available to support the uncertainty[75]. The Court judged the reliability of scientific evidence, putting itself in a position of 'super-expert'.

This behaviour of the Court echoes the words written by the International Court of Justice Judges Al-Khasawneh and Simma, who warned against the insufficient adjudicatory methods for evaluating evidence, especially when a case is fact-intensive[76]. Hence, stuck in a deadlock, the Court of First Instance constructed the scientific uncertainty which paved the way for the application of the precautionary principle[77]. Since in all cases of uncertainty scientific opinions might differ, this would mean that the precautionary principle has the potential to be always applied, and hence practically being deprived of meaning. I agree with the argument made by the two aforementioned authors, who acknowledged the importance of the precautionary principle, but at the same time considered that it was necessary to rethink the role of scientific advice in decision-making about uncertain risks[78]. Another author, commenting the *Pfizer* case, pointed out that 'from invocations of the precautionary principle in practice, it is clear that non-scientific decision-making plays an essential role in finding a triggering risk'[79]. I will now turn to the two cases on glyphosate and the hunting management of wolves to see whether, and if so, how, there has been an evolution in the recent jurisprudence of the CJEU concerning the application of the precautionary principle.

4.1. Science, precaution, and glyphosate

Glyphosate is an active substance used in pesticides to control plants, which means it is a herbicide, used in agriculture, horticulture and in some non-cultivated areas as well[80]. It has been used for decades and its effects have been assessed by Member States, the European Chemicals Agency, and the European Food Safety Authority. Though its use is authorised in the European Union at least until the next renewal scheduled in 2022, through an Implementing Regulation of the Commission[81], the substance has raised much controversy and debate. In Italy, for example, a decision

[74] van Asselt and Vos, *op. cit.*, 325.
[75] *Ivi*, 326.
[76] See above, para. 3.
[77] *Ivi*, 329.
[78] Ibid.
[79] V.R. Walker, *The Myth of Science as a 'Neutral Arbiter' for Triggering Precautions*, in *Boston College International and Comparative Law Review*, 2003, 26, 225.
[80] https://ec.europa.eu/food/plant/pesticides/glyphosate_en
[81] Commission Implementing Regulation (EU) 2017/2324 of 12 December 2017 renewing the approval of the active substance glyphosate in accordance with Regulation (EC) No 1107/2009 of the European Parliament and of the Council concerning the placing of plant protection products on the market and amending the Annex to Commission Implementing Regulation (EU) No 540/2011. C/2017/8419, *OJ L 333, 15.12.2017*, 10-16.

was taken at regional level; the *Consorzio del prosecco Docg Conegliano-Valdobbiadene* has banned the glyphosate since 1. January 2019[82]. Luxembourg banned the use of this active substance in January 2020. The decision was announced by the Minister of Agriculture and will lead to the prohibition of any glyphosate's containing products as of 1. January 2021[83].

European Courts rendered two judgments on glyphosate in 2019. In *Antony C. Tweedale v. European Food Safety Authority*[84], the General Court annulled the decision of the European Food Safety Authority denying the applicant access to two studies on the toxicity of glyphosate. In the second one, decided on 1. October 2019, *Blaise and others*, which is particularly relevant for the analysis in these pages, the Grand Chamber of the CJEU assessed the validity of Regulation No. 1107/2009 on the placing of plant protection products[85], including glyphosate, also in light of the precautionary principle, but could not have a final word on the 2017 decision of the Commission to authorise glyphosate in Europe. The contested regulation provides the legal framework for the authorisation of plant protection products in commercial form and for their placing on the market, use and control. The Regulation is based on the precautionary principle as it is stated in Article 1, which is worth reproducing *in extenso*:

> The provisions of this Regulation are underpinned by the *precautionary principle* in order to ensure that active substances or products placed on the market do not adversely affect human or animal health or the environment. In particular, Member States shall not be prevented from applying the precautionary principle where there is scientific uncertainty as to the risks with regard to human or animal health or the environment posed by the plant protection products to be authorised in their territory[86].

In the preamble, the reversal of the burden of proof is formulated as follows:

> The precautionary principle should be applied and this Regulation should ensure that industry demonstrates that substances or products produced or placed on the market do not have any harmful effect on human or animal health or any unacceptable effects on the environment (recital No. 8).

The case originated from a criminal proceeding started in France against Mr Blaise and 20 people who entered shops in Ariège and damaged cans of weed killer, containing glyphosate. The accused argued that their action was based on the principles of necessity and precaution and aimed to inform shops of the dangers

[82] The decision was however put into question after the publication of the report by the US environmental protection agency, which affirmed that it 'continues to find that there are no risks of concern to human health when glyphosate is used in accordance with its current label. EPA also found that glyphosate is unlikely to be a human carcinogen.' https://www.epa.gov/ingredients-used-pesticide-products/glyphosate

[83] https://blogdroiteuropeen.com/2020/02/04/luxembourg-to-become-the-1st-eu-country-to-ban-glyphosates-products-a-commentary-by-alessandra-donati/

[84] Judgment of the GC of 7 March 2019, *Antony C. Tweedale v. European Food Safety Authority*, T-716/14, EU:T:2019:141

[85] Regulation (EC) No 1107/2009 of the European Parliament and of the Council of 21 October 2009 concerning the placing of plant protection products on the market and repealing Council Directives 79/117/EEC and 91/414/EEC, *OJ L 309, 24.11.2009, 1–50.*

[86] Emphasis added.

associated with the substances. The referring court considered it necessary to understand whether the Regulation was valid in light of the precautionary principle. The Court first defined the precautionary principle, relying on previous jurisprudence, as follows: 'where there is uncertainty as to the existence or extent of risks to human health, protective measures may be taken without having to wait until the reality and seriousness of those risks become fully apparent'[87]. It also added the following, not thus crystal-clear, formula: 'Where it proves to be impossible to determine with certainty the existence or extent of the alleged risk because the results of studies conducted are inconclusive, but the likelihood of real harm to public health persists should the risk materialise, the precautionary principle justifies the adoption of restrictive measures.' In other words, the uncertainty of the risk, which is proved by the current level of science, combined with the (non-hypothetical) real harm in case the risk materialises leads to restrictions on the basis of the precautionary principle. The judges then contended that, based on the Regulation under assessment, it is first necessary to identify the 'potentially negative consequences for health of the use of the active substances and plant protection products,' then to conduct a 'comprehensive assessment of the risk to health based on the most reliable scientific data available and the most recent results of international research'[88]. Even though the CJEU tried to avoid any scientific evaluation, referring to the fact that it is for the local authorities to decide, it inevitably decided on scientific matters. For example, being absent a definition of active substance in the Regulation, the Court concluded that active substances could be defined on the basis of Article 2(2) of the Regulation, as 'having general or specific action against harmful organisms or on plants, parts of plants or plant products are to be regarded as active substances,' and that the application for the authorisation must be accompanied by a complete and a summary dossier for each substance[89]. With regard to the cumulative effects of substances, the Court considered as crystal-clear that an assessment of the cumulative effects had to be conducted relying on both the Regulation and on the Commission Regulation of 1 March 2013 setting out the data requirements for plant protection products. From the systemic interpretation of different legal instruments, the Court concluded that 'the authorisation of a plant protection product must necessarily include an assessment not only of the specific effects of the active substances contained in that product, but also of the cumulative effects of those substances and their effects combined with other constituents of that product'[90]. Even stressing how it is up to the local authorities to decide in the matters, it is evident that the Court, by interpreting the legislation, told the referring judge how 'scientific' an analysis should be. Hence, for example, the Court acknowledged that 'the Member State to which an application is submitted must undertake an independent, objective and transparent assessment of that

[87] *Blaise*, para. 43.
[88] *Blaise*, para. 46.
[89] *Blaise*, paras. 54-55.
[90] *Ivi*, para. 75.

application in the light of current scientific and technical knowledge, while the Authority must adopt a decision in the *light of current scientific and technical knowledge*'[91]. What if the current knowledge is divided, though? In light of the precautionary principle, the authorities must take into account relevant evidence other than the tests, analyses and studies submitted by the applicant, in particular 'the most reliable scientific data available and the most recent results of international research and not to give in all cases preponderant weight to the studies provided by the applicant'[92]. The burden of proof lies on the applicant to demonstrate that a product has no immediate or delayed harmful effect on health, but then the competent authorities must, in accordance with the precautionary principle, take into account other studies and researches, and if the applicant is not able to ensure the authorities that the requirements for the approval are satisfied, then the application must be rejected[93]. According to the test on weak-moderate or strong precaution[94], this is a case of moderate-to-strong precaution, because uncertainty entails regulation and a potential ban.

The referring court also asked the Court to assess the compatibility of the Regulation with the precautionary principle where it exempted the applicant from carrying out tests of long-term carcinogenicity and toxicity. The Court disagreed with the referring court, since the applicant had to show the absence of immediate or delayed harmful effects on human health, and therefore the authorities, when examining the application, had to be sure that the analysis conducted by the applicant excluded the risk of carcinogenicity and toxicity[95]. The validity of the regulation was upheld. This does not mean that glyphosate was authorised by the Court, but that the Regulation at the basis of the mechanism of authorisation respects EU law and the precautionary principle. If asked to analyse the Commission Implementing Regulation No. 2017/2324 of 12 December 2017, the Court might have probably reached the same conclusion as in the *Pfizer* case. Subject to the *uncertainty* of the risk, which is demonstrated in the case of glyphosate by the available contradictory scientific knowledge, the precautionary principle as legal principle would have suggested to the Court that the authorisation had not to be granted.

4.2. Science, precaution and non-human animals

Few days later than the judgment on glyphosate, the CJEU decided on whether legal killing for management purposes was allowed under European Union law, in particular under the 1992 Habitats Directive[96], with the declared purpose to prevent illegal killings. The judgment in the *Tapiola* case says much more than the obvious – that the Habitats Directive does not grant an absolute protection

[91] *Ivi*, para. 88.
[92] *Ivi*, para. 94.
[93] *Ivi*, para. 95.
[94] See above, note 55.
[95] *Ivi*, para. 116.
[96] Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, *OJ L 206, 22.7.1992, 7–50.*

without derogation to species and habitats[97] – and provides a restrictive interpretation of the derogations included in the Habitats Directive, in light of the precautionary principle. The case originated from the action brought in front of the Finnish courts by Tapiola, a Finnish association for nature conservation, against the Finnish Wildlife Agency which authorised the killing of a total of seven wolves in the region of Pohjois-Savo (Finland) during the period between 23 January and 21 February 2016. The Agency argued that the management measure was necessary to prevent poaching and that it was taken in consideration of the harm wolves had caused to other animals over the years and the concern expressed by local population. The *Korkein hallinto-oikeus* (Supreme Administrative Court of Finland) referred the case to CJEU, asking for the interpretation of Article 16 (1) of the Habitats Directive, which reads:

> Provided that there is no satisfactory alternative and the derogation is not detrimental to the maintenance of the populations of the species concerned at a favourable conservation status in their natural range, Member States may derogate from the provisions of Articles 12, 13, 14 and 15 (a) and (b): [...] e). to allow, under strictly supervised conditions, on a selective basis and to a limited extent, the taking or keeping of certain specimens of the species listed in Annex IV in limited numbers specified by the competent national authorities.

The wolf is one of the species of Community interest, subject to different regulations depending on the location. Annex IV of the Directive lists the species that must be strictly protected, and Annex V grants a more flexible regime. Annex V included the Finnish wolf in the reindeer management area at the time of the national decision on the hunting management[98]. When wolves are subject to the regime under Annex IV of the Directive, the exception to the prohibition of killing under Article 12 is through derogations under Article 16(1)(e). The CJEU interpreted the derogation in a very restrictive way, eventually relying on the precautionary principle. The Court first noted that a derogation decision must define the objectives of that derogation 'in a clear and precise manner and with supporting evidence'[99]. It acknowledged that combating poaching is a means of contributing to the maintenance of restoration of the species and an object covered by Article 16 of the Habitats Directive[100]. The Court, as in previous judgments, contended that it is up to the national authority to support 'on the basis of rigorous scientific data, including, where appropriate, comparative data on the effects of hunting for population management purposes on the conservation status of wolves,' that hunting for population management purposes 'is *actually* capable of reducing illegal hunting to such an extent that it would have a net positive effect

[97] See S. De Vido, *Protecting Biodiversity in Europe: The Habitats and Birds Directives and Their Application in Italy in an Evolving Perspective*, in Y. Nakanishi (ed.), *Contemporary Issues in Environmental Law - The EU and Japan*, Tokyo, 2016, 115 ss.

[98] At the time of writing, all wolves in Finland are included in Annex IV, since Annex V encompasses the Spanish wolves North of the Duera and Greek populations North of the 39th parallel only.

[99] *Tapiola*, para. 41.

[100] *Ivi*, para. 43.

on the conservation status of the wolf population, whilst taking account of the number of derogation permits envisaged and the most recent estimates of the number of wolves taken illegally'[101]. The first element of the analysis is hence to demonstrate that the measure is actually aimed at the conservation of the species. The referring Finnish Court objected that there was not any scientific evidence concerning the legal hunting of protected species as a way to reduce poaching and to promote the conservation of wolves. Tapiola and the Agency had opposite views on the matter. The second element of the analysis was the absence of alternatives. In that respect, the Court first argued that the existence of an illegal activity cannot 'exempt a Member State from its obligation to ensure the safeguarding of species protected'[102]. The competent national authorities – said the Court – when authorising derogation must establish, 'taking account in particular of the best relevant scientific and technical evidence and in the light of the circumstances of the specific situation in question, that there is no satisfactory alternative that can achieve the objective pursued, in compliance with the prohibitions laid down in the Habitats Directive'[103]. The existence of an illegal activity cannot alone be sufficient to support a decision in that respect. Even though the Court referred the case to the domestic court (to confirm or not the conclusion of the European Court), it went thus far as to say that 'there is nothing in the order for reference to indicate that the Agency has demonstrated that the only way of achieving the objective relied upon in support of the derogation permits for population management purposes was to authorise … a certain level of wolf hunting for population management purposes'[104], and that the Agency could not demonstrate the absence of satisfactory alternatives. Furthermore, the measure must ensure not to be detrimental to the conservation status of the population[105]. In considering the number of wolves killed in 2015-2016 for management purposes – the data being provided by Tapiola and the European Commission – the Court considered that it was not thus clear whether the management plan and the national law were in conformity with the requirements identified by its own judgment, and that it was up to the referring court to decide[106]. The precautionary principle is applied in this pivotal paragraph[107]:

> In that context, it must also be noted that, in accordance with the precautionary principle enshrined in Article 191(2) TFEU, if, after *examining the best scientific data available, there remains uncertainty* as to whether or not a derogation will be detrimental to the maintenance or restoration of populations of an endangered species at a favourable conservation status, the Member State must refrain from granting or implementing that derogation.

[101] *Ivi*, para. 45.
[102] *Ivi*, para. 48.
[103] *Ivi*, para. 51.
[104] *Ivi*, para. 52.
[105] The Court then referred, following the legal reasoning of the Advocate General, to the level of conservation of the species in the biogeographical region (para. 58 ss.).
[106] *Tapiola*, para. 65.
[107] *Ivi*, para. 66.

In other words, it is important to have the certainty of the uncertainty of the outcome of a certain measure or contradictory positions on the same outcome to apply the precautionary principle. The burden of proof is on the competent authority – the Finnish Agency – to establish, on the basis of scientific data, that the territorial and quantitative limits are sufficient to ensure that the derogations 'will not be detrimental to the maintenance of the population of the concerned species at a favourable conservation status in its natural range'[108]. The Court, in a very short passage, argued that 'derogations by way of exception must be assessed also in the light of the precautionary principle'[109]. It seems to imply that when the authority is not capable, using the best scientific data available, of demonstrating that the measure will not be detrimental to the population, the measure must be avoided. The number of species to be kept or taken must also depend on scientific data provided by the authority, and must be 'the narrowest, most specific and efficient way possible'[110]. The derogation decided by the national agency did not seem to oblige hunters to target specific specimens. Data showed that 20 alpha males were killed in the previous hunting year, raising doubts on the efficiency of the management. This is a case of strong precaution under the Garnett and Parsons scheme.

4.3. Same principle, different application

Though concerning both environmental issues, the two judgments differ on one hand for the fact that the regulation on substances already encapsulated the precautionary principle, which is not the case for the Habitats Directive, and, on the other hand, in the object of the protection: on one hand (*Blaise and others*) human health, on the other (*Tapiola*) the conservation of wolves. The strict standards of interpretation are usually applied to protect human health, as defined in the founding treaties (Article 191(1) TFEU). For the first time, the Court went beyond a strict anthropocentric view – consciously or not – by recognising the relevance of conservation measures for the non-human animals and not for humans, applying the precautionary principle in light of the scope of the Habitats directive, which is to protect the natural heritage of the Union.

In terms of the application of the precautionary principle, it is interesting to note that, compared to the glyphosate, the Court in the *Tapiola* case went a step further: in interpreting the Habitats Directive, it did not only set the requirements for a measure to be in conformity with the Directive, but also cast doubts on the compatibility of the national measure. As it was argued, 'tolerance hunting of wolves could in principle be based on Article 16(1)(a), although the evidence proving such hunting to be firmly in the wolf's own interest would need to be at

[108] *Ivi*, para. 67.
[109] *Ivi*, para. 69. See also the similar conclusions reached by Advocate General Saugmandsgaard Øe, Opinion of 8 May 2019, para. 92.
[110] *Ivi*, para. 73.

least as strong'[111]. Science only can justify future legitimate hunting, the precautionary principle 'prevent[ing] Member States from making exceptions to strict protection if the best available science leaves uncertainty as to whether the conservation status of population involved would be negatively affected'[112]. Science was fundamental in both cases for the application of the precautionary principle. As for the glyphosate case, the Court delved into how scientific an analysis had to be, in light of the 'most reliable' and 'most recent' scientific research, excluding that the authorities can rely on the assessment presented by the applicant only. The precautionary principle, applied in its moderate to strong case, is described as the impossibility to determine, using the most recent and reliable scientific data, the alleged risks but, in order not to be a mere hypothesis, the likelihood of real harm must persist. In the *Tapiola* case, the reference is to the 'most rigorous data' in a comparative perspective, and the precautionary principle is described as the uncertainty that remains as to whether or not the measure (in this case hunting management) is detrimental to the conservation of species. The burden of proof lies on the applicant (for the substance) and on the authority that decides the measure on hunting management.

5. The precautionary principle as a political tool to be examined through the lens of reasonableness

I am suggesting here that authorities could use the precautionary principle as a political tool in front of the uncertainties of science[113], and that its application should be assessed by courts in light of the principle of *reasonableness*. As Scott pointed out, 'there is a rich body of literature in the environmental social sciences and science and technology studies that cautions that precautionary decision-making is inherently political and that it is misleading to suggest that it can be exclusively 'science-based'[114]. Another author talked about the 'myth' of neutrality of science for triggering precaution, and that non-scientific decisions are necessary when 'lawmakers define the factual predicate for taking precautions'[115]. The element of 'harm', according to this author, is also subject to non-scientific decisions; he argued that 'a definition of the *kind* and *degree* of 'harm' that *should*

[111] A. Trouwborst, F.M. Fleurke, *Killing Wolves Legally: Exploring the Scope for Lethal Wolf Management under European Nature Conservation Law*, in *Journal of International Wildlife Law & Policy*, 22(3), 2019, 269. See also, Y. Epstein, G. Chapron, *The Hunting of Strictly Protected Species: The Tapiola Case and the Limits of Derogation under Article 16 of the Habitats Directive*, in *European Energy and Environmental Law Review*, 2018, 27(3), 78 ss.

[112] Y. Eppstein and others, *EU Court: Science must justify future hunting*, in *Science*, 2019, 366(6468), 2019, 961.

[113] The Advocate General Sharpston, in her opinion, confirmed to a certain extent the fact that the precautionary principle is a political tool, because she contended that once a) assessed the potentially negative consequences for health and the environment of the proposed substance, and b) conducted the comprehensive risk assessment of the risk to health, *then* the authorities can apply the precautionary principle. See her opinion to the *Blaise and others* case, of 12 March 2019, para. 48.

[114] Scott, *Legal Aspects*, 11.

[115] Walker, *op. cit.*, 198.

trigger precautionary measures is necessarily a balance of risks and benefits under the circumstances, which is beyond the domain of pure science[116]. The boundaries between precaution and prevention are also blurred. If science can determine the severity of the potential harm and the likelihood that the risk materialises, then the measures that will be applied fall under the category of prevention rather than of precaution[117]. Given the uncertainties that stem from the application of the precautionary principle, the suggestion here is to use this principle as a parameter of reasonableness, which is not unknown to the CJEU[118]. Reasonableness refers to the fact that 'in given contexts and matters the law has to refrain from governing human behaviour with specific and detailed rules of conduct;' it is a 'general standard guiding the ascertainment and evaluation of the particular situation'[119]. The principle responds to the quests for adaptability and flexibility. To be reasonable, a person should rely on the conclusions of science, when they are well-established and do not present any controversy. Rawls pointed out that science 'can provide for all the widely recognised elements of objectivity to a greater extent than any other human enterprise'[120]. However, as a philosopher of law contended, reasonableness can lead to a 'unenlightened conformism deferential to the judgments of the authority', as Rawls and others might suggest, or to an open-minded view which defends 'the most outlandish speculations [...] supporting them with the most diverse and the most exquisite arguments that 'a reason slave of the passion' can suggest'[121]. Despite the argument on the most outlandish speculations seems to me controversial, because it can lead to the denial of well-established scientific theories, even to the point of jeopardising human health, if applied to the uncertainty of the application of the precautionary principle, it particularly works. In the case of glyphosate, as anticipated, there are opposite views: on one hand, authorities and national agencies are contending that there seem to be no negative effects for human health, and, on the other hand, serious doubts are raised by other researchers supported by civil society on the risk of potential harm. Where is the truth? Here we cannot enter the philosophical debate on truth, which is far beyond my knowledge, but this debate happens in front of a court, which is asked whether a measure can or cannot be adopted on the basis of the precautionary principle. How risky should be the risk to trigger the principle? And how solid must be science to shift the balance from a yes to a no?

Given these considerations, I consider reasonableness to be useful to solve the *impasse*. Far from being a secondary principle – Corten argued – the principle provides flexibility for rules, fills the lacunae in existing law 'bringing about systematisation and legitimacy for the international legal order, and providing

[116] Walker, *op. cit.*, 200.
[117] Bassan, *op. cit.*, 75.
[118] See, in that respect, A. Adinolfi, *The Principle of Reasonableness in European Union Law*, in G. Bongiovanni, G. Sartor, C. Valentini (eds), *Reasonableness and Law*, Dordrecht, Heidelberg, London, New York, 2009, 383 ss.
[119] S. Bertea, *Certainty, Reasonableness and Argumentation in law*, in *Argumentation*, 18, 2004, 467-468.
[120] J. Rawls, *Political Liberalism*, Columbia, Columbia University Press, 1996, 110.
[121] A. Artosi, *Reasonableness, Common Sense and Science*, in Bongiovanni et al., *op. cit.*, 77.

room for different interpretations'[122]. The objection could be that in this way the vagueness of the precautionary principle is solved using another vague principle. Nonetheless, Corten clearly highlighted how the notion of reasonable 'demonstrates the contradiction between, on one hand, the static nature of a legal system and the need to integrate facts [...] within the system'[123]. Corten suggested that the verification that a specific measure is reasonable depends on three stages (from a substantive point of view)[124]. First, a legitimate purpose or objective, which is discretionary. In the cases under analysis, the legitimate purposes were to protect human health and the conservation of species (in the *Tapiola* case this purpose was supposed to be reached through the fight against poaching). Secondly, the casual link between the measure and the legitimate purpose. Is this not precisely what the CJEU assessed in the *Tapiola* case? Whether hunting management could reduce illegal poaching? Thirdly, the proportionality of the measure. Again, in the *Tapiola*, was it not the assessment of whether the measure of hunting management was *efficient* to reach the declared scope and whether alternatives were considered and later excluded? To the substantive element of the concept should be added the formal element – the existence of a justificatory discourse – which must be exempted from contradictions and be based on an understandable and logical reasoning[125]. Here precaution has a role to play; it justifies and explains the adoption of certain measures in an understandable and logical way. The formal aspect is rational, relative and temporary, it can change over time according to the evolution of science[126].

As they are described, the substantive and the formal elements of reasonableness identified by Corten suggest that it is a matter of procedure more than of evaluation of science. This finds confirmation in the thought of the two authors that identified a paradox in the application of the precautionary principle and contended that two actions are required: the first one is 'the epistemological acceptance that in case of uncertain risk, guarantees are not to be found in scientific truth and certainty,' and the second one is 'the insight that the interpretation and application of the precautionary principle should be considered in a procedural sense'[127]. It means that, owing to the acknowledgement of the uncertainty of science, authorities will interpret the 'uncertainty information' in a discretionary way, explaining the reasons why the principle is invoked. As a consequence, 'an aggrieved party could still challenge Commission/Council decisions, but not any longer in a way that would force the Court to review scientific claims. The aggrieved party may bring forward that the normative preferences are

[122] Corten, *Reasonableness in International Law*, in R. Wolfrum, *The Max Planck Encyclopedia of Public International Law*, Oxford, 2013, 645 ss.
[123] O. Corten, *The Notion of 'Reasonable' in International Law: Legal Discourse, Reason and Contradictions*, in *International Comparative Law Quarterly*, 48(3), 1999, 617.
[124] Corten, *The Notion*, cit., 623.
[125] Corten, *The Notion*, cit., 621-622.
[126] Corten, *The Notion*, cit., 623.
[127] van Asselt and Vos, *op. cit.*, 332. The two authors applied the 'test' to the *Pfizer* case.

debatable'[128]. 'Debatable' precisely entails a reasonableness analysis with the assessment of the alternatives and the respect of the principle of proportionality. In this way, more than objective as used by the International Court of Justice[129], reasonableness is subjective, because it is based on a decision of the authorities authorising or not a substance relying on the precautionary principle, whose application will be assessed following the scheme: justificatory discourse (formal), legitimate purpose, causal link and proportionality (substantive). Science matters when the applicant (the company asking for the authorisation or the agency willing to support a measure jeopardising the conservation of a species) presents its application. It is not far from what the CJEU already does. The CJEU used some elements of reasonableness in the two judgments under analysis, especially the *Tapiola* case, which shows an evolution in the legal reasoning of the court. The glyphosate case resembles the *Pfizer* case in the sense that the uncertainties of science led to the application of the precautionary principle, without questioning the causal link of the measures though reflecting on proportionality (it could have been a costs-benefits analysis). It confirmed the substantive element of the legitimacy of the objective – human health – but the legal reasoning seemed to be stuck in the search for the certainty of the uncertainties of the risk. In the *Tapiola* case, as I anticipated, the Court applied *de facto* a reasonable test, using science and the precautionary principle to raise serious doubts on the legitimacy and the proportionality of the measure adopted by the Finnish agency which authorised the hunting management.

6. Concluding remarks

In these pages, I have proposed an analysis of the precautionary principle as a political tool whose invocation can be assessed in court using the lens of *reasonableness*. This argument will allow to (partly) solve the short circuit of the application of the precautionary principle which needs science though from science only takes the (non-hypothetical) uncertainty. To reduce the role of courts as 'scientific expert', I suggested the test of reasonableness, which does not totally exclude science, but avoids the risk for the court to become the 'decision-makers' of which scientific outcome should prevail. This analysis of the precautionary principle seems in line with the inevitable character of uncertainty of the principle. As Foster pointed out:

> How much scientific uncertainty would there have to be for the precautionary principle to apply? Determining an objective and precise level

[128] Ibid.

[129] I am referring to the 'objective reasonableness' applied by the International Court of Justice in the *Whaling in the Antarctic* case (para. 67). For a critical approach of the standard used by the Court, see S.R. Tully, *'Objective Reasonableness' as a Standard for International Judicial Review*, in *Journal of International Dispute Settlement*, 6(3), 2015, 546 ss. See also C. Ragni, *Interpretazione dei trattati e standard of review nella giurisprudenza della Corte internazionale di giustizia: riflessioni sull'affare della caccia alla balena nell'Antartico*, in *Rivista di diritto internazionale*, 2014, 3, 725 ss.

> of scientific certainty or uncertainty in relation to any piece of scientific knowledge is not possible[130].

She discussed the concepts that have been used to grasp in scientific terms the principle, such as 'reasonable scientific plausibility' or 'reasonable concern' for harm. However, none of these can really solve the issue of how courts can delve into scientific matters. The solution that is proposed in these pages resembles the legal reasoning that was followed by the CJEU in its recent *Tapiola* case, which deserves closer attention not only for what concerns the *reasonableness* test, which was implicitly applied according to my analysis, but also because it shows an unprecedented eco-centric move that leaves hope for the future jurisprudence of the Court on the conservation and preservation of non-human animals[131].

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[130] Foster, *op. cit.*, 256.

[131] See on the change of paradigm in international environmental law, S. De Vido, *Climate Change and the Right to a Healthy Environment*, in S. Baldin, S. De Vido (eds), *Environmental Sustainability in the European Union: Socio-Legal Perspectives*, Trieste, 2020, 101 ss.