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THE PRECAUTIONARY PRINCIPLE UNDER EUROPEAN UNION LAW

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Abstract

By acknowledging the flexible and complex nature of the precautionary principle in EU law, the purpose of this paper is to provide a polycentric interpretation of this principle based on diversity rather than uniformity. To achieve this objective, a methodology derived from the methodological pluralism is employed. This allows for the *unitas multiplex* between the different definitions and applications of the precautionary principle to be researched. The core claim of this paper is that the polycentric interpretation of the precautionary principle can be built on two concepts: anticipation and action. In the first part of this paper, I argue that anticipation implies the qualification by law and the evaluation by the science of uncertain risks. In the second part, I consider that, after having anticipated the time of action, decision-makers should act based on the precautionary principle. However, the action undertaken has different meanings and consequences from the procedural and substantive perspective. From the procedural side, the decision-makers should take into account this principle, while they remain free, on the substantive side, to adopt a precautionary measure.

Content

Introduction

The purpose of this paper is to analyse the precautionary principle under EU law. To do so, it is important to consider that we live in a society of "uncertainty".[1] Until recently, people

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[1] CHAUVEL L., *Le destin des générations: Structure sociale et cohortes en France au XX^e siècle*, Paris, PUF, 2002.

behaved as if the Earth had been inexhaustible, the sea incorruptible, the human species immortal. The certainty of progress was based on invulnerable humanity. Suddenly the linear ascent was broken. Absolute faith in man's ability to master nature and technology was replaced by a progressive acceptance of the limited nature of scientific knowledge. Science is the place of doubt; science generates uncertainty.[2] A society of uncertainty, contemporary society is also, in the words of the German sociologist Ulrich Beck, the "risk society."[3] The risks that threaten our society are not only linked to natural disasters but are mostly generated by the society itself. For Beck, modernisation is now operating against itself through the induced effects it causes, particularly in terms of ecological and technological risks. Progress, together with wealth, generates risks: pollution, industrial disasters, deforestation, loss of biodiversity, pandemics, etc. The preservation of the planet through the control of these risks becomes a necessity. This is why the German philosopher Hans Jonas considers that the power that science and technology confer on humankind brings with it a new responsibility — that of preventing significant risks of damage to the environment and public health to pass on to future generations a living Earth.[4]

It is in this context that the analysis of the precautionary principle shall be placed. Provided for by article 191 § 2 of the Treaty on the Functioning of the European Union ("TFUE"), the precautionary principle is a founding principle of the European environmental policy. Moreover, since the *National Farmers' Union and United Kingdom/Commission* judgments of 5 May 1998, the Court of Justice of the European Union ("CJEU") has also repeatedly applied the precautionary principle in the field of public health.[5] It is in the field of public health that the precautionary principle is today most often invoked under EU law.[6]

The precautionary principle can be defined as a principle of anticipated action, which — in a context of risk and uncertainty for the environment and public health — requires the competent authorities to anticipate the traditional time for the adoption of a measure to protect the environment and public health.[7] This means that decision-makers shall not wait until the risk is certain, from a scientific point of view, but shall act before when the risk is only uncertain. From this perspective, the precautionary principle entails a significant change in the time-management of risks by requiring the competent authorities to anticipate the time of action.

Although it is one of the most evoked principles, its meaning and effects are not univocally conceived, and the precautionary principle remains a highly controversial principle under EU law.[8] On the one hand, the precautionary principle is considered as "a principle

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[2] DUPUY R-J., *L'humanité dans l'imaginaire des Nations*, Paris, Éditions Juillard, coll. « Conférences, essais et leçons du Collège de France », 1991, p.71.

[3] BECK U., *Risk Society: Towards a New Modernity*, SAGE Publications Ltd, July 1992.

[4] JONAS H., *Le principe de responsabilité. Une éthique pour la civilisation technologique*, Paris, Cerf, 1995.

[5] CJEU 5 May 1998, *National Farmer's Union*, C-157/96, EU: C: 1998: 191, 64; CJEU 5 May 1998, *United-Kingdom/Commission*, C-180/96, EU:C:1998:192, 100.

[6] CJEU 26 May 2005, *Codacons and Federconsumatori*, C-132/03, EU: C: 2005: 310; CJEU 12 January 2006, *Agrarproduktion Staebelow*, C-504/04, EU:C:2006:30; GC 10 March 2004, *Malagutti-Vezinhet*, T-177/02, EU:T:2004: 72; GC 7 March 2010, *Acino/Commission*, T-539/10, EU:T:2013:110.

[7] DONATI A., *Le principe de précaution en droit de l'Union européenne*, Bruxelles, Bruylant, *forthcoming*, 2021, p.72.

[8] MOLFESSIS N., « Préface », *in* TAPINOS D., *Prévention, précaution et responsabilité civile. Risque avéré, risque suspecté et transformation du paradigme de la responsabilité civile*, Paris, L'Harmattan, 2008, p.9.

particularly necessary in our time,"[9] and an essential tool to protect the environment and public health.[10] On the other hand, for someone, precaution is a "scaring principle"[11] which may "kill the law";[12] for others, it is "anti-science principle" which is a vector of "technophobia."[13] These diverging interpretations can be explained if we consider that the precautionary principle is not an easy subject matter.[14] The difficulties in analysing the precautionary principle are mainly linked to its post-modern nature.

If the concept of post-modernism is not new and in the last century has been applied to art, architecture, music, literature, and many other creative endeavours, in the last thirty years post-modernism grew out specifically of literary criticism in many colleges and universities in Europe and the US as a result of Jean-François Lyotard influential book *The Post-modern condition*.[15] Due to the diversity of its expressions and the breadth of its manifestations, it is difficult to provide a comprehensive definition of post-modernism. However, it can be argued that one of its foundational concepts lies in Derrida's theory of "deconstructing" literature.[16] For Derrida, it is impossible to rely on the idea that an author knows what he or she "meant" in a text, so we must deconstruct it and examine it as a function of the political, social, historical, and cultural assumptions behind it. The same idea of deconstruction is also embraced by sociologists, philosophers, political scientists and others who consider that it should apply not just to literary texts, but also far more broadly in relation to all human behaviours, since, in a sense, everything could be interpreted as a text and deconstructed.[17] Even from the legal perspective, from the late 1970s onwards, we have witnessed the progressive deconstruction of the traditional paradigm of modernity because it was incapable of describing the contemporary era or facing its challenges.[18] These transformations are of such magnitude that one may speak of "genetic mutation" of modern society.[19] This evolution is reflected in the questioning of the primacy of reason, leading to a corresponding loss of confidence in science and disillusionment with the idea of progress. The emphasis is now on disorder, complexity, indeterminacy, and relativism, which are seen as the main characteristics of the "post-modern condition."[20]

The relationship between post-modern law and modern law must not be posed in terms of substitution, but on the contrary of coexistence, or more precisely of interweaving. In this sense, post-modernity can be considered as a process of adapting modern law to the new

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[9] NAIM-GESBERT E., *Droit général de l'environnement*, Paris, Lexis-Nexis, 2014, p.90.

[10] DELMAS-MARTY M., « Préface, Le principe de précaution et le paradoxe de l'anthropocène », *in* D'AMBROSIO L., GIUDICELLI-DELAGE G., MANACORDA S. (eds), *Principe de précaution et métamorphose de la responsabilité*, Paris, Collection de l'Institut des sciences juridiques et philosophiques de la Sorbonne, 2018, p.15.

[11] BRONNER G., GEHIN E., *L'inquiétant principe de précaution*, Paris, PUF, 2010, p.177.

[12] FELDMAN J-M., « Le projet de loi constitutionnelle relatif à la Charte de l'environnement », *Recueil Dalloz,* n° 15, 2004, pp.970–972.

[13] LECOURT D., « Technophobie », *Cités*, 2000, p.15.

[14] NAIM-GESBERT E., « Lumières du principe de précaution. À propos de la résolution du 1er février 2012 de l'Assemblée nationale », *Rev. Jur. Env*., 2013, p.203.

[15] LYOTARD F., *The postmodern condition*, Manchester, Manchester University Press, 1979.

[16] J. DERRIDA, *De la Grammatologie,* Paris, Éditions de Minuit, 1967.

[17] MCINTYRE LEE, *Post-truth*, Cambridge, MIT Press, 2018, pp.124–125.

[18] ABDELHAMID H., « Les paradigmes post-modernes et la démarche pluraliste dans la recherche juridique » *in* OTIS G. (eds), *Méthodologie du pluralisme juridique*, Paris, Karthala, 2012, p.139.

[19] ZAGREBELSKY G., *Le droit en douceur (Il diritto mite)*, trad. par. Leroy M., Paris, Economica, 2000, p.35.

[20] LYOTARD J-F., *The postmodern condition, op. cit.*

context of contemporary societies. While modern law had been built according to a pyramid of ordered norms, post-modern law is made in a network. The network is an open structure where different elements interact, integrate, and are conditional on each other. The circular nature of post-modern law supersedes the hierarchical nature of modern law. The State loses its monopoly in the elaboration of the law to the benefit of a plurality of non-state actors. This phenomenon — called regulatory pluralism — is based on the recognition that the law exists alongside a variety of lesser normative orderings.[21] This means that under post-modernity, governments no longer monopolise regulation, which is not monolithic, but rather an "unsystematic collage of inconsistent and overlapping parts.[22] The knowledge of the law, which yesterday claimed its methodological purity, is now more the result of contextualised experience (learning process) than of *a priori* axioms. This does not mean that post-modernity marks the transition from order to disorder, but that the "new order" established by post-modernity is based on diversity rather than uniformity: rigidity gives way to flexibility, verticality to horizontality, hierarchy to coordination.[23]

Under the theoretical framework of post-modernism, the analysis of the precautionary principle is utterly significant since it can be defined as a "paradigmatic principle" of post-modern law. Indeed, the precautionary principle shares the same features of flexibility and complexity, which belong to post-modern principles.

The flexibility of the precautionary principle is due to its vague, soft and gentle nature ("*un principe flou, mou et doux*").[24] The *vague* nature of a principle is perceived as a result of the lack of precision in the law.[25] The texts create areas of uncertainty and indeterminacy without indicating the conditions for the application of the norm.[26] The vagueness of the law is thus accompanied by a margin of appreciation granted to the receivers of the norm who are required to interpret and implement it. These considerations can be extended to the precautionary principle. The norms on which it is based are limited to mentioning it without defining its content and conditions of implementation.[27] Article 191 § 2 TFEU merely provides that the Union's environmental policy shall be based on the precautionary principle. Similarly, secondary legislation does not specify what the precautionary principle is but merely refers to it. This implies that it is not possible to deduce precisely the obligations arising from the precautionary principle. In the absence of predetermination in the text of the law, the meaning of this principle depends mainly on the interpretation given to it by the decision-makers and the judge who co-determine the scope of this principle.[28] *Softness* refers to the

[21] GALANTER M., "Justice in many rooms: Courts, private ordering and indigenous law," *Journal of Legal Pluralism and Unofficial Law*, 1981, 13(19), pp.1–47.

[22] BLACK J., "Decentring regulation: Understanding the role of regulation and self-regulation in a post-regulatory world", *Current Legal Problems*, 2001, 54, pp.103–146.

[23] CHEVALLIER J., « Vers un droit post-moderne? Les transformations de la régulation juridique », *Revue du droit public et de la science politique*, Librairie Générale de Droit et de Jurisprudence, n° 3, 1998, p.674.

[24] DELMAS-MARTY M., « Où va le droit? Entre pot au noir et pilotage automatique, le droit peut-il nous guider vers une mondialité apaisée? », *La Semaine Juridique*, n° 14, avril 2018, p.677.

[25] DELMAS-MARTY M., *Le flou du droit,* Paris, PUF, coll. « Les voies du droit », 1986.

[26] CHEVALLIER J., « Vers un droit post-moderne? Les transformations de la régulation juridique », *op. cit*., pp.677–679.

[27] FISHER E., « Opening Pandora's box: contextualizing the precautionary principle in the European Union » *in* EVERSON M., VOS E., *Uncertain Risks Regulated*, New York, Routledge-Cavendish, 2012, pp.23–24.

[28] CHEVALLIER J., « Vers un droit post-moderne? Les transformations de la régulation juridique », *op. cit*., p.678.

binding nature of the legal norm.[29] Post-modern law is considered a soft law since the legal norm loses its mandatory character compared to modern law and its application depends, "no longer on submission, but the adherence of the recipients."[30] The precautionary principle can be considered a soft principle whose legal force has long been controversial.[31] It was believed that to the extent that the content of the precautionary principle is not precisely determined, this principle could not be imposed on its recipients.[32] Therefore, the precautionary principle had been interpreted as being a political principle that guides the action of public decision-makers without producing legal effects.[33] Today, a large majority of the doctrine recognises that the precautionary principle is a binding legal principle.[34] The flexibility of its content and its low degree of precision are no longer seen as obstacles to the recognition of its binding force. While public decision-makers retain considerable flexibility in choosing how to implement it, the fact remains that the precautionary principle does have legal effects. Nevertheless, although recognised, the binding force of the precautionary principle remains weak, and it is limited to the procedural side.[35] As stated by Mireille Delmas-Marty, the *gentle* nature of a principle expresses the absence or difficulty of imposing a sanction when a legal norm is violated.[36] Precaution is a gentle principle insofar as it is not easy to punish its violation; decision-makers enjoy broad discretion in its application.[37] This is due to the scientific and political complexity of the choices facing decision-makers. In a context of high scientific technicality and politically sensitive cases, such as those characterising the precautionary principle, the judge refuses to substitute his assessment of factual elements for that of the decision-makers and limits his control.[38]

According to Edgard Morin, complexity is a fabric of heterogeneous constituents inseparably associated.[39] Complexity is not the opposite of simplicity but unidimensionality: complexity is what cannot be summarised in a single word, what cannot be reduced to a simple idea.[40] For Morin, understanding complexity requires a change of perspective on the law in the sense of opening it up; complex thinking aspires to multidimensional knowledge.[41] The

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[29] DELMAS-MARTY M., « Où va le droit? Entre pot au noir et pilotage automatique, le droit peut-il nous guider vers une mondialité apaisée? », *op. cit*., p.677.

[30] CHEVALLIER J., « Vers un droit post-moderne? Les transformations de la régulation juridique », *op. cit*., pp.677–678.

[31] VAN LANG A., *Droit de l'environnement*, Paris, PUF, 4e ed, 2016, p.107.

[32] DE SADELEER N., *Environmental principles. From political slogans to legal rules*, Oxford, Oxford University Press, 2002, pp.308–309.

[33] KRÄMER L., « General principles of community environmental law and their translation into secondary law», *RAE*, 1999, n° 3–4, pp.355–362.

[34] DE SADELEER N., *EU environmental law and the internal market*, Oxford, Oxford University Press, 2014, p.41; HILSON C., « Rights and principles in EU law: a distinction without foundation,» *MJ*, v° 15, n° 8, 2008, pp.193–216; WINTER G., « The legal nature of environmental principles in international, EC and German law », *in* MACRORY R. (eds), *Principles of European environmental law*, Groeningen, Europa Law, 2004, pp.19–22.

[35] DONATI A., *Le principe de précaution en droit de l'Union européenne*, *op. cit*, p.21.

[36] DELMAS-MARTY M., « Où va le droit? Entre pot au noir et pilotage automatique, le droit peut-il nous guider vers une mondialité apaisée? », *op. cit*., p.680.

[37] EUROPEAN COMMISSION, *Communication of the Commission on the precautionary principle*, COM (2000)1 final, p.15.

[38] GC, 17 February 1998, *Pharos SA/Commission of the European Communities*, T-105/96, EU:T:1998:35, 69.

[39] MORIN E., *Introduction à la pensée complexe*, Paris, Éditions du Seuil, 2005, p.21.

[40] *Ibidem*.

precautionary principle is a complex principle, which operates at the intersection of different disciplines. The precautionary principle is a legal principle, but its understanding is not limited to the legal domain. Analysing the precautionary principle involves addressing the relationship between law and science; between law and political science, it also provides an understanding of how ethics, morality, philosophy, economics, and sociology influence the authorities when making decisions about risk. Moreover, within the legal domain, precaution is the result of a negotiation between scientific experts and political decision-makers. Precaution is a risk management principle that is applied by policymakers. However, the scientific experts commissioned by decision-makers to assess the uncertain risk involved are the only ones who can evaluate the extent of this risk and thus provide policy guidance. On the one hand, without the input of scientific experts, decision-makers would not be able to adopt the precautionary principle. On the other hand, without policymakers, experts would be limited to a scientific risk assessment without the means to adopt a protection measure at the political level.

Against this backdrop, which methodology shall be used to analyse the precautionary principle under EU law? The choice made in this paper is to refer to the methodological pluralism.[42] This proves to be an adequate methodology to master the flexibility and complexity of the precautionary principle. Methodological pluralism is part of the theoretical trend of post-modernism and is presented as a new approach to studying legal reality.[43] With post-modernism, the foundations of law become more complex as a result of changes in contemporary society. Similarly, with methodological pluralism, the method used to analyse the legal system evolves to take into account its complexity. In a legal context strongly marked by the presence of antinomies, lawyers are required to look for elements of coherence and consistency.[44] In other words, lawyers shall seek the commonalities within the different norms and the multiple actors of our legal system. The order that we are looking for is not monolithic and static, but polycentric and dynamic.[45] It is based on diversity rather than uniformity.[46]

To research the *unitas multiplex* between the different interpretations and applications of the precautionary principle, I tried to *weave* its conceptual network under EU law. The etymology of the term "network", from the Latin *retis*, refers to the idea of a net. The use of the word evokes a textile metaphor implying the presence in a *weft* of a combination of *knots*. The *knots* correspond to the fundamental concepts that make it possible to identify the precautionary principle under EU law. In light of this, the core claim of this paper is that the polycentric interpretation of the precautionary principle can be built on two concepts: anticipation and action, which represent the two main *knots* of the conceptual network of the precautionary principle. On the one hand, anticipation is the *sine qua non*-condition for action.

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[41] MORIN E., *Introduction à la pensée complexe*, *op. cit*., p.11.

[42] OST F., VAN DE KERCHOVE M., *De la pyramide au réseau? Pour une théorie dialectique du droit*, Bruxelles, Publications des Facultés universitaires Saint-Louis, 2002, 597 p. ; OTIS G. (eds), *Méthodologie du pluralisme juridique*, Paris, Karthala, 2012, 282 p.

[43] LOMAKINA I., « Aspects méthodologiques du droit coutumier à la lumière des paradigmes classiques et non classiques », *Revue Droit et Cultures*, n° 50, 2005, pp.49–63.

[44] MORIN E., *Introduction à la pensée complexe, op. cit*., p.104.

[45] GROSSI P. *Novecento giuridico: un secolo pos-moderno*, *in* GROSSI P. (eds), *Introduzione al Novecento giuridico*, Roma-Bari, Laterza, 2012.

[46] CHEVALLIER J., « Vers un droit post-moderne? Les transformations de la régulation juridique », *op. cit*., spéc. p.673.

On the other hand, the action is the necessary consequence of anticipation. Although decision-makers have anticipated the time for action by taking into account uncertain risks, without action, the occurrence of these risks could not be prevented. Within the conceptual network of the precautionary principle, the *knots* "anticipation" and "action" are not isolated, but they are connected to other more specific *knots* that, as it will be demonstrated, contribute to a better understanding of the precautionary principle under EU law.

In light of the above, Section 1 will analyse the precautionary principle as an anticipation principle, and Section 2 will examine its scope as an action principle.

I. *Anticipation*

The word anticipation derives from the Latin *anticipare*. *Anticipare* means advancing in the sense of acting before the due time.[47] The precautionary principle is an anticipation principle because it enables the decision-makers to anticipate the time of action when there is a risk affecting the environment and public health. If traditionally, public action was conditional upon the proof of a *certain* risk, the precautionary principle allows anticipating the time of action to the stage of *uncertainty*. According to this principle, the absence of certainty as to the existence or extent of a risk to the environment and public health does not constitute a reason to postpone the adoption of a measure, which may prevent the occurrence of such risk.[48] Therefore, decision-makers shall act as soon as possible to avoid the occurrence of an uncertain risk.

Because the notion of uncertain risk is at the heart of anticipation, it is essential to understand its meaning. A first approach may consist in defining what an uncertain risk is. This is a difficult task. The notion of uncertain risk is both vague and interdisciplinary, and it is hard to describe it. Each discipline (from natural sciences to social sciences and law) has its definition of uncertain risks.[49] This explains why it does not exist one, unique and general, definition of uncertain risks but many sectorial definitions. Instead of defining them, it is worth understanding at which conditions uncertain risks justify the anticipation of the time of action. At this regard, it can be argued that uncertain risks shall meet two requirements. They shall have a legal basis and scientific foundation. This means that uncertain risks shall be qualified by law (A) and evaluated by science (B). The "qualification by the law" and the "evaluation by the science" constitute two *knots* linked to the *knot* "anticipation".

1. The Qualification by the Law of Uncertain Risks

Qualification is the basis of any legal reasoning.[50] It can be defined as the intellectual proceeding of juridical analysis under which a factual element is taken into account by law, and it is inserted into a legal category for the production of legal effects.[51] The purpose of the

[47] CASTIGLIONI L., MARIOTTI S., *Il Vocabolario della Lingua Latina*, Torino, Loescher; 4° edizione, 2008, p.107.

[48] NOIVILLE C., « Science, décision, action: trois remarques à propos du principe de précaution », *LPA*, 2004, p.10.

[49] DE SADELEER N., *Les principes de polluer-payeur, de prévention et de précaution*, *Essai sur la genèse et la portée juridique de quelques principes du droit de l'environnement*, Bruxelles, Bruylant, 1999, pp.250–251.

[50] NICOD M. (eds), *Les affres de la qualification juridique*, Institut Fédératif de Recherche « Mutation des normes juridiques », Université Toulouse I, 2016, p.1.

qualification is the identification of the legal regime applicable to the elements belonging to a specific legal category.[52] Because they have similar features (and thus they belong to the same legal category), they are submitted to the same legal regime. It is worth asking if uncertain risks can be considered as a legal category under EU law. Two reasons might explain the importance of such qualification. From one side, the creation of categories answers to the need for simplification and intelligibility of law.[53] In this regard, the qualification by EU law of uncertain risks may clarify the conditions for the application of this principle. From the other side, the building of legal categories is a guaranty of the objectivity and rationality of legal solutions. By using legal categories, the judge can verify the existence of a correlation between certain factual elements and the legal consequences that the decision-makers have attributed to such elements. In this sense, the qualification of uncertain risks may be seen as an instrument for controlling the rationale for the adoption of a precautionary measure.

At first sight, one may consider that uncertain risks are not a legal category under EU law. Indeed, the CJEU, which mainly contributed to the definition of the conditions for the application of the precautionary principle, never referred to the uncertain risks as being a legal category. One may thus consider that, without an express qualification, it is impossible to conceive uncertain risks as a category. This argument shall be rejected as the proceeding of qualification is often hidden.[54] This means that the creation of a legal category is not always expressly demonstrated. Still, it results implicitly from the establishment of a correlation between a factual element and a legal consequence. After the introduction of the precautionary principle under EU law in 1992, the CJEU *de facto* qualified uncertain risks as a legal category. Even if the term category is not used, the CJEU precisely defined the features of uncertain risks, which distinguish them from the other risks.[55] As a legal category, to the uncertain risks, which meet these criteria, the CJEU attach specific legal consequences: the obligation for the decision-makers to take into account the precautionary principle.

As indicated by the CJEU, the precautionary principle applies when there are uncertainties as to the existence or extent of a risk to the environment and public health.[56] By reading these judgements, one may wonder which the relation between risk and uncertainty is and, especially if these are two separate notions or one notion composed of two elements. This question is of great importance. What is at stake is the appraisal of the object of the qualification operated by EU law and, thus, the scope of application of the precautionary principle. Shall this principle apply when there is a risk, *and* an uncertainty; or shall it apply when there is an *uncertain risk*? The choice of one of these two options may have significant consequences for the use of the precautionary principle. If the first option is retained, this would mean that risk and uncertainty have their distinctive features. When implementing the precautionary principle, decision-

[51] CORNU G., *Vocabulaire juridique*, Paris, PUF, 2014, p.827.

[52] BLUMANN C., « Les catégories juridiques en droit de l'Union européenne, Conclusions », *in* BERTRAND B., *Les catégories juridiques du droit de l'Union européenne*, Bruxelles, Bruylant, 2016, p.415.

[53] BERTRAND B., « Les catégories juridiques établies par le Traité de Lisbonne: un mal nécessaire? », *in* BERTRAND B., *Les catégories juridiques du droit de l'Union européenne*, *op. cit*., p.17.

[54] NICOD M. (eds), *Les affres de la qualification juridique*, *op. cit*., p.3.

[55] CJCE 23 sept. 2003, *European Commission/Kingdom of Danemark*, C-192/01, ECLI:EU:C:2003:492; GC 17 May 2018, *Bayer CropScience AG/European Commission*, T-429/13 and T-451/13, ECLI:EU:T:2018:280, 162.

[56] CJEU 5 May 1998, *National Farmers' Union and others*, C-157/96, *prec.*; CJEU 5 May 1998, *United Kindom/ European Commission*, C-180/96, *prec.*; GC 11 September 2002, *Pfizer Animal Health/Council*, T-13/99, *prec*.

makers shall give evidence that the conditions regarding the existence of a risk and uncertainty are met. If, on the other hand, the second option is chosen, it would be enough for the decision-makers to demonstrate that the risk at stake is uncertain; uncertainty would not be a different condition for the application of the precautionary principle, but a further element of qualification of the risk.

The CJEU did not specify which solutions shall be followed under EU law. Likewise, legal scholars refer indistinctively to risk and uncertainty as well as uncertain risks.[57] This confusion is due to the fact the precautionary principle applies to prevent the occurrence of uncertain risk, but the notions of risk and uncertainty have their distinctive feature. This means that the condition for the application of the precautionary principle is the existence of uncertain risk. Nevertheless, within the notion of uncertain risk, it is worth distinguishing and analysing the notions of risk and uncertainty separately.

The notion of risk

The CJEU considers that the precautionary principle shall be applied without having to wait until the *reality* and *seriousness* of the risk are fully demonstrated by scientific data.[58] Consequently, the risk triggering the application of the precautionary principle has two main features: from a scientific/objective point of view, it is *real*, and from the social/subjective perspective, it is *serious*. An objective risk is a risk that can be identified on a quantitative basis by applying a scientific calculation, which aims at measuring the probability of its occurrence.[59] Because it represents a mathematical probability, the risk can be evaluated in an impersonal manner. The evaluation of risk is made by scientific experts by using scientific documents, studies and parameters. In addition to its scientific/objective side, each risk also has a social/subjective part. Indeed, risk cannot be separated from the lives of people. As affirmed by the German sociologist Ullrich Beck, either we consider that any man independently of his revenues, level of formation, profession and accommodation is equally exposed to the risks or we are obliged to reformulate the traditional thoughts on the nature of risks to affirm that the risk evolves according to the changes lived by its recipients.[60] In this sense, it can be considered that the risk has a subjective nature. The perception of risks is not fixed and absolute, but it depends on the personal features and state of mind of the people called to appreciate its existence. Under EU law, the political decision-makers (EU institutions and competent authorities of the Member states) make the appreciation of uncertain risk. This appreciation is critical: only uncertain risks which are considered sufficiently severe justify the anticipation of the time of action based on the precautionary principle.

The notion of uncertainty

Uncertainty is the essence of the anticipation and the *raison d'être* of the precautionary principle. Considering its importance, one may assume that many legal contributions have been

[57] DE SADELEER N., *Environmental Principles. From Political Slogans to Legal Rules*, *op. cit*.; EVERSON M., VOS E., *Uncertain Risks Regulated*, New York, Routledge-Cavendish, 2012, 430 p.

[58] CJEU 23 September 2003, *European Commission/Kingdom of Danemark*, C-192/01, *prec.*, 49; CJEU 2 December 2004, *European Commission/The Netherlands*, C-41/02, EU:C:2004:762, 51–52; CJEU 22 December 2010, *Gowan Comércio Internacional and Servicos Lda*, C-77/09, EU:C:2010:803, 73; CJEU 8 July 2010, *Afton Chemical Limited*, C-343/09, ECLI:EU:C:2010:419, 62.

[59] BOURG D., SCHLEGEL J.L., *Parer aux risques de demain, Le principe de précaution*, Seuil, 2000, p.36.

[60] BECK U., *Risk Society: Towards a New* Modernity, op. *cit.*

dedicated to the appraisal of uncertainty. This is not the case; uncertainty remains largely unexplored under legal literature. The reason might be that the notion of uncertainty is transversal (it permeates different fields of law) and interdisciplinary (it overcomes the legal field and extends to the other areas). These features make very hard any attempt to define it. Hence, uncertainty remains a heterogeneous notion, which is challenging to limit into the perimeter of a single definition. However, by comparing the different definitions of uncertainty employed under EU law, it results that the uncertainty has two major characters. From one side, it derives from a limitation of the available knowledge. It is, in other words, a *cognitive uncertainty*; from the other side, because the missing knowledge is scientific, the uncertainty is qualified as *scientific*.

On the one hand, uncertainty is due to lacking knowledge about the existence or extent of a risk. The missing knowledge is the one that the experts have when the scientific evaluation of the risk is carried out. The level of uncertainty depends on the material and temporal conditions under which the evaluation of risk is executed. The time available to assess the risk as well as the number of available resources can have an impact on the degree of uncertainty. This is the reason why uncertainty is usually higher when the evaluation is executed in an urgent situation. With more time and more resources to obtain additional information on the risk, the level of uncertainty may be reduced. Furthermore, the degree of uncertainty is conditional upon the subjective appreciation of the experts assessing the risk at stake. From this perspective, as highlighted by the European Food Safety Authority, one may consider that there is not one uncertainty, but as many uncertainties as they are perceived by the experts evaluating the risk.[61]

On the other hand, uncertainty results from a limitation of *scientific knowledge*. This means that the available scientific data are not enough to infer with certainty as to the existence or extent of risk. Because a minimum number or amount of scientific data is present, uncertainty differs from the ignorance that is when no scientific information is available.[62] Besides the cases of ignorance, the lack of information might be qualitative or quantitative. From a quantitative perspective, scientific knowledge is lacking if available data are not enough to let the experts establishing, without any doubts, that the risk at stake will occur.[63] Scientific knowledge may also be lacking from a qualitative perspective. First of all, available data may be *unclear*. They may not be updated, or due to their vague scope, they may confront the experts to an important margin of error.[64] Secondly, scientific data might be *ambiguous* and, thus, the experts may not be in the position to infer a grounded conclusion from the current scientific information.[65] Thirdly, the information might be *inconclusive:* there might be too many possible causes for the occurrence of a specific phenomenon to assign a probability to each of them.[66] Finally, there might be a divergence in the way in which experts are

[61] EUROPEAN FOOD SAFETY AUTHORITY, "The principles and methods behind EFSA's Guidance on Uncertainty Analysis in Scientific Assessment", *EFSA Journal*, 2018, p.24.

[62] ALEMANNO A., *Trade in food: regulatory and judicial approaches in the EC and the WTO*, London, Cameron May, 2007, pp.131–132.

[63] DE SADELEER N., « Securité alimentaire et précaution », *in* MAHIEU S., MERTEN LENTZ K. (eds), *Sécurité alimentaire. Nouveaux enjeux et perspectives*, Bruxelles, Bruylant, 2013, pp.312–313.

[64] *Ibidem*.

[65] EUROPEAN COMMISSION, *Communication of the Commission on the precautionary principle*, COM (2000) 1 final, p.7.

[66] EUROPEAN ENVIRONMENTAL AGENCY (« AEE »), *Late lessons from early warnings: science, precaution,*

interpreting the content of a scientific study because the available information is *contradictory*.[67]

2. The Evaluation by the Science of Uncertain Risks

For the decision-makers to anticipate the time of action, the uncertain risk shall be evaluated by scientific experts. Such evaluation is the condition for the anticipation. Only uncertain risks that have been assessed by experts through scientific expertise justify the anticipation of the action based on the precautionary principle.

At first sight, the importance granted to the scientific expertise may surprise. Indeed, the context of the application of the precautionary principle is characterised by scientific uncertainty. In this scenario, science is not able to give certainties as to the existence or the extent of the risk at stake. Therefore, one may wonder why science is still conceived as the condition for the anticipation of the time of action. To understand this apparent paradox, it is worth considering, as stated by the CJEU, that the risk, despite its uncertain nature, shall be scientifically grounded.[68] This means that scientific experts through a scientific risk assessment shall assess the probability of occurrence of the risk. Hypothetical risks, which do not have a scientific basis, shall not trigger the anticipation of the time of action according to the precautionary principle.

Despite its importance for the application of the precautionary principle, the procedure for the carrying out of the scientific assessment of uncertain risks is poorly regulated under EU law. A uniform legal framework setting out the rules for performing the scientific expertise has not yet been formulated. Only a minimal number of indications as to the conditions to be fulfilled by the experts and the qualities of the expertise have been specified by the Commission or, in the absence of other indications, by the legal doctrine. Thus, the experts are chosen on the basis of their competence to give a detailed opinion on a technical or scientific question, but no list of experts who may provide an expert opinion before applying the precautionary principle is laid down.[69] Experts must be separated from policymakers,[70] and must be independent of the authorities commissioning the expertise and the third parties potentially affected by their decision.[71] The expertise must be of high quality,[72] it must be based on the best available scientific data, it must be conducted by experts in a transparent manner,[73] and it shall take into account minority opinions.[74]

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innovation, Copenhague, 2013, p.631.

[67] GC 11 September 2002, *Pfizer Animal Health/Council*, T-13/99, *prec.*, 394; CJEU 8 July 2010, *Afton Chemical Limited*, C-343/09, *prec*, 59.

[68] CJEU 22 December 2010, *Gowan Comércio Internacional and Servicos Lda*, C-77/09, *prec.*, 73; GC 12 April 2013, *Du Pont de Nemours (France) SAS and others/European Commission*, T-31/07, ECLI:EU:T:2013:167, 140.

[69] HERMITTE M-A., « Expertise scientifique: l'indépendance n'est pas tout », *Pour la Science*, n° 439, May 2014, p.14.

[70] EUROPEAN COMMISSION, *Communication of the Commission on the precautionary principle*, *op. cit*., p.3.

[71] ENCINAS DE MUNAGORRI R., « Quel statut pour l'expert? », *RFAP*, v° 3, n° 103, 2002, pp.379–389, spéc. p.383.

[72] EUROPEAN COMMISSION, *Communication of the Commission on the collection and use of expertise by the commission: principles and guidelines*, COM (2002) 713 final, pp.8–10.

[73] *Ibidem*.

[74] EUROPEAN COMMISSION, *Consumer health and food safety*, COM (1997) 183 final, p.16.

II. *Action*

The precautionary principle is not only a principle of anticipation; it is also an action principle.[75] It imposes on the political decision-makers the responsibility to act without waiting for scientific certainty. As stated by Advocate General Michal Bobek in his opinion in the case *Giorgio Fidenato and others* of 13 September 2017, today's society "is characterised by unclear risks resulting from new technologies and, more broadly, from rapid scientific progress. In such a society, public authorities may wish to rely on a rule of action in situations of uncertain risks."[76] It appears "that the precautionary principle takes on such a rule."[77] This means that the protection of the environment and public health in the face of uncertain risks requires decision-makers to act based on the precautionary principle to prevent the occurrence of these risks.

The definition of the precautionary principle as an action principle raises an important legal question: are decision-makers bound to act based on the precautionary principle, or do they enjoy any discretion in this regard? The answer is not straightforward. The CJEU recognises alternately the *possibility* for decision-makers to apply the precautionary principle and the *obligation* to do so. In some judgments, the CJEU holds that decision-makers *may* adopt a precautionary measure;[78] in others, the Court considers that the precautionary principle *requires* the authorities to take measures for the protection of the environment and public health.[79]

However, a closer analysis of these judgments shows that there is a difference between the obligation and the discretion to act based on the precautionary principle. On the one hand, from a *procedural* point of view, decision-makers have a duty to act. This means that they have an obligation to take into account the precautionary principle. On the other hand, in *substantive* terms, the authorities enjoy a broad discretion. Therefore, they are free to decide to implement the precautionary principle by adopting a precautionary measure.

To illustrate the dialectic between procedure and form in the application of the precautionary principle, I will analyse in Section A the obligation to take into account the precautionary principle and in Section B the discretion to implement a precautionary measure. Within the conceptual network of the precautionary principle, the "obligation to take into account this principle" and the "discretion to implement a precautionary measure" constitute the two main *knots* connected to the *knots* "action".

1. The Obligation to Take into Account the Precautionary Principle

A careful reading of the EU secondary legislation containing a reference to the

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[75] DONATI A., *Le principe de précaution en droit de l'Union européenne*, *op. cit*., p.220.

[76] Conclusions Advocate General Michal Bobek, CJEU 13 September 2017, *Giorgio Fidenato and others*, C-111/16, EU:C:2017:248.

[77] *Ibidem*.

[78] CJEU 22 December 2010, *Gowan Comércio Internacional and Servicos Lda*, C-77/09, *prec*., 73; GC 12 April 2013, *Du Pont de Nemours (France) SAS and others/European Commission*, *prec*., 135.

[79] CJEU 2 December 2004, *European Commission/The Netherlands*, C-41/02, *prec*., 45; GC 26 November 2002, T-74/00, T-76/00, T-83/00, T-84/00, T-85/00, T-132/00, T-137/00 and T-141/00, *Artegodan GmbH and others/ Commission*, EU:T:2002:283, 192; GC 21 May 2015, *Rubinum/European Commission*, T-201/13, EU:T:2015:311, 60.

precautionary principle shows that the binding force of this principle must be interpreted as an *obligation to take it into account*.[80] Indeed, in these texts, whether it concerns the cross-border movement or deliberate release of GMOs into the environment, or waste management, toy safety or the placing on the market of food or biocidal products, the obligation for decision-makers to apply the precautionary principle is conceived as an obligation to take it into account. Such an obligation has procedural content. As the General Court points out, compliance with procedural obligations "constitutes the primary *raison d'être* of the precautionary principle."[81] This is explained by the fact that the precautionary principle applies to prevent the occurrence of uncertain risk. In this context, it is difficult, if not impossible, to predetermine the factual elements that decision-makers will face in each case, and thus, the content of the actions they will have to implement. Uncertainty does not allow prognostics based on experience or a cause-and-effect relationship. The law is not in a position to establish every possible answer under uncertain assumptions. Given the impossibility of setting the substantive content of the precautionary principle in advance, it is preferable to set general objectives (in this case, the protection of the environment and public health) and the procedural obligations that decision-makers will have to comply with to achieve them.

The procedural obligations governing the application of the precautionary principle can be divided into two categories: the obligation to take into account the results of the scientific expertise and the obligation to take into account the other pros and cons of the action. These categories represent two separate *knots* linked to the *knot* "obligation to take into account the precautionary principle."

The obligation to take into account the results of the scientific expertise

The obligation to take into account the results of the scientific expertise gives rise to a *duty of care* and a *duty of motivation*.

Concerning the duty of care, decision-makers shall examine, carefully and impartially, the scientific assessment made by experts before the adoption of a precautionary measure.[82] Furthermore, they shall ground their decision with the best and more recent scientific evidence to show that although uncertain, the risk is sufficiently probable to require the implementation of a protective measure.[83] In addition, decision-makers shall take into account any new scientific knowledge arising after the expert assessment has been carried out, which could change the evaluation of the risk and the uncertainty at stake. As stated by the CJEU in the

[80] REGULATION n° 1946/2003 of the European Parliament and of the Council of 15 July 2003 on transboundary movements of genetically modified organisms, OJ 2003 L 287, pp.1–10; DIRECTIVE n° 2001/18/CE of the European Parliament and of the Council of 12 March 2001 on the deliberate release into the environment of genetically modified organisms OJ L 106 2001, pp.1–39; DIRECTIVE n° 2008/98/CE of the European Parliament and of the Council of 19 November 2008 on waste, OJ 2008 L 312, pp.3–30; DIRECTIVE n° 2009/48/CE of the European Parliament and of the Council of 18 June 2009 on the safety of toys, OJ L 170 2009, pp.1–37; REGULATION (CE) n° 178/2002 of the European Parliament and of the Council of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety OJ L 31 2002, pp.1–24; REGULATION n° 528/2012 of the European Parliament and of the Council of 22 May 2012 concerning the making available on the market and use of biocidal products.

[81] GC, 11 September 2002, *Pfizer Animal Health/Council*, T-13/99, *prec*., 170–172.

[82] CJEU 21 November 1991, *Technische Universität München/Hauptzollmt München–Mitte*, C-269/90, EU:C:1991:438, 14; GC 11 September 2002, *Pfizer Animal Health/Council*, *prec*.

[83] GC 16 September 2013, *Animal Trading Company and others/European Commission*, T-333/10, EU:T:2013:451.

case *French Republic/Commission* of 11 July 2013,[84] and by the General Court in the *Solvay Pharmaceuticals/Council* case of 21 October 2003,[85] the production of new scientific knowledge may require a re-examination of the measure taken according to the precautionary principle. Therefore, when new elements change the perception of risk or show that this risk can be limited by less restrictive measures than that already in place, it is up to the authorities to ensure that the measures taken are adapted to the new available scientific data.[86]

As to the duty of motivation, decision-makers shall indicate the factual and legal elements on which their decision is based and, if they wish to depart from the results of the scientific assessment carried out by the experts, they shall base their decision on another opinion of at least the same scientific level as the opinion they depart from.[87]

The obligation to take into account the other pros and cons of the action

The obligation to take into account the pros and cons of the action implies the duty of decision-makers to analyse the costs and benefits that could result from an action based on the precautionary principle. In this regard, in the case *Basf Agro BV/European Commission* of 17 May 2018,[88] the CJEU explicitly recognised the binding nature of the cost and benefit analysis and the obligation for the decision-makers to carry it out before the adoption of a precautionary measure. Yet, the Court has not specified the modalities of this examination, which leaves decision-makers with a wide margin of discretion.[89] According to the EU Commission, the assessment of the costs and benefits of the action is generally carried out through an economic cost-benefit analysis or via the proportionality test of the precautionary measure.[90] In both cases, decision-makers shall take into account their obligation to give precedence to environmental and public health protection requirements over economic considerations.[91]

Two reasons could explain the CJEU's emphasis on the binding nature of the costs and benefits analysis concerning the application of the precautionary principle. First, when decision-makers act based on the precautionary principle, the alternative is never or very rarely risk/no risk, as the assumption of zero risks is difficult to envisage in practice. In addition to the benefits in terms of reducing risk to an acceptable level, the implementation of the precautionary principle could lead to negative consequences in terms of costs or new risks to be borne by the society. Therefore, decision-makers need to consider all the costs and benefits of the action resulting from the application of the precautionary principle. Secondly, the obligation to analyse the costs and benefits of the action responds to the need to broaden the spectrum of elements taken into consideration by decision-makers before the adoption of a precautionary measure to include non-scientific considerations. Although scientific risk assessment is the central pillar around which the decision-making system based on the precautionary principle is

[84] CJEU 11 July 2013, *French Republique/European Commission*, C-601/11, EU:C:2013:465.

[85] GC 21 October 2003, *Solvay Pharmaceuticals/Council,* T-392/02, EU:T:2003:277.

[86] CJEU 11 July 2013, *French Republique/European Commission*, *prec*., 110; GC 21 October 2003, *Solvay Pharmaceuticals/Council,* T-392/02, *prec*., 130–135.

[87] TPICE arrêt du 11 septembre 2002, *Pfizer Animal Health/Council*, *prec*., 199.

[88] GC 17 May 2018*, Bayer CropScience AG/European Commission, prec.*

[89] CJEU 13 March 2019, *Poland/European Parliament and Council of the European Union*, C-128/17, ECLI:EU:C:2019:194.

[90] EUROPEAN COMMISSION, *Communication of the Commission on the precautionary principle*, *op. cit*., 19.

[91] CJEU 12 July 1996, *United Kingdom/European Commission*, Decree, C-180/96, EU:C:1996:308, 93; CJEU 17 July 1997 *Affish*, C-183/95, EU:C:1997:373, 43 and 57.

built, it is not sufficient to assess the full extent of risk. This is all the more relevant since the condition for the application of the precautionary principle is the existence of scientific uncertainty as to the existence or extent of the risk. In this context, science is not in a position to provide a certain answer as to the probability of occurrence of a risk. Therefore, it is essential that decision-makers do not limit themselves to scientific advice alone, but broaden the range of factors taken into account before acting according to the precautionary principle.

2. The Discretion to Implement a Precautionary Measure

When applying the precautionary principle, the decision-makers enjoy a wide discretionary power. This is explained by the scientifically and politically very complex nature of the cases with which they are confronted and by the context of scientific uncertainty in which they act. As stated by Advocate General J. Mischo in the case *Commission of the European Communities/Kingdom of Denmark* of 12 December 2002, "the greater the scientific uncertainty, the greater the margin of appreciation of the authority".[92] Since the available scientific data do not support decision-making on the risk with certainty and the existence or extent of the risk remains uncertain, it is for decision-makers, in the exercise of their discretion, to decide whether and how to implement a precautionary measure. Therefore, the choice of the response to be given is the result of a discretionary decision based on the level of risk deemed acceptable by the authorities. Consequently, the decision-makers could resolve to implement a precautionary measure, but they are not obliged to do so if they estimate that the conditions at stake do not require the implementation of such a measure. Furthermore, if a precautionary measure is adopted, its content will not be predetermined but will vary depending on the specific features of the risk and the uncertainty at stake. In other terms, there is no catalogue of precautionary measures. Still, it is up to the competent authorities to exercise their discretionary power to decide whether and how to implement, in each specific situation, a precautionary measure.

Against this backdrop, the CJEU, called upon to verify the legality of the action of decision-makers, takes a deferential approach. It refuses to substitute its assessment of the factual elements for that of the authority and restricts the intensity of its review. The Court considers that it does not have to resolve complex issues, which are subject to the discretionary power of the decision-makers.[93] Indeed, any more precise control could involve a dangerous shift in the dividing line between the judge and the administrator.[94] In this sense, while it is up to the decision-makers to assess the scientific basis and the political importance of the risk, the judge must confine himself to checking that the decision-makers have made correct use of their discretionary power without reassessing the factual elements of the case at stake.

The wording used by the CJEU to explain the restriction of its control varies. In some cases, it considers that it must "verify compliance with the procedural rules, the substantive accuracy of the facts relied on by the Commission, the absence of manifest error in the

[92] CONCLUSIONS of the Advocate General J. Mischo, CJEU 23 September 2003, *European Commission/Kingdom of Danemark*, C-192/01, EU:C:2002:760, 103.

[93] GC 17 February 1998, *Pharos SA/European Commission*, T-105/96, EU:T:1998:35, 69.

[94] Christine Noiville, « Du juge guide au juge arbitre? Le rôle du juge face à l'expertise scientifique dans le contentieux de la précaution », *in* Eve Truilhe-Marengo (eds), *La relation juge-expert dans les contentieux sanitaires et environnementaux*, Paris, La Documentation française, 2011, p.82.

assessment of those facts or the absence of misuse of powers."[95] In other cases, it assesses whether, when acting based on the precautionary principle, the decision-makers "have not committed a misuse of powers, a manifest error of assessment, or have not manifestly exceeded the limits of their discretion."[96] Yet, in other cases, the Court examines whether the authorities have not "seriously and manifestly disregarded the limits of their discretionary power."[97] Despite the variability of the formulations used, the restriction of the intensity of the review amounts to sanctioning the existence of a *manifest* defect of assessment.[98] This can be explained if we consider that the misuse of power is very rarely pronounced when it comes to sanctioning violations of the precautionary principle. It would have to be proven, and this proof is challenging to provide, that the decision-makers acted for the exclusive or at least decisive purpose of achieving ends other than those intended.[99] This would be equivalent to demonstrating that, in their action based on the precautionary principle, the decision-makers have pursued an illicit motive that disregards the legal aim.[100] Since misuse of power is rarely pronounced, the restriction of control amounts to censuring manifest defects of legality, whether a manifest error of assessment or a manifest violation of the limits of discretionary power. These two grievances are often dealt with together by the Court without any real distinction being made.[101] For this reason, the concepts of manifest error and manifest exceeding of the limits of discretion converge, the latter being conceived as a variant of the manifest error and not as a category in its own right. A defect in legality (error or exceeding the limits of discretion) has a manifest character if two conditions are met. First, the defect must be apparent. This means that the defect must be indisputable: if there is any doubt, or if the assessment of the authority, which presided over the act is plausible, the defect cannot be described as evident.[102] Moreover, the defect must be severe. Only acts based on a seriously erroneous use of the freedom of assessment enjoyed by the decision-makers are sanctioned.[103]

To ascertain whether the decision-makers have manifestly violated the precautionary principle, the CJEU carries out a review of the *plausibility* of their decisions. Thus, the Court examines the material accuracy of the evidence relied on, its reliability and consistency, but also checks whether this evidence constitutes all the relevant data that must be taken into consideration to assess a complex situation and whether it is of such a nature as to support the conclusions drawn from it.[104]

In addition to the plausibility test and given the broad discretionary power enjoyed by decision-makers in the application of the precautionary principle, the CJEU verifies whether the

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[95] CJEU 18 July 2007, *Industrias Químicas del Vallés/ European Commission*, *prec*., 75–76.

[96] CJEU 9 September 2003, *Monsanto Agricoltura Italia*, C-236/01, EU:C:2003:431, 135. GC 12 April 2013, *Du Pont de Nemours (France) SAS and others /European Commission, prec*., 155.

[97] GC 12 April 2013, *Du Pont de Nemours (France) SAS and others/European Commission*, *prec*, 155.

[98] NEHL H-P, « Judicial review of complex socio-economic, technical, and scientific assessments in the European Union », *in* MENDES J, *EU executive discretion and the limits of law*, OUP, 2019, pp.178–180.

[99] CJEU 12 November 1996, *United Kigdom/Council*, C-84/94, EU:C:1996:431, 69.

[100] BOUVERESSE A., *Le pouvoir discrétionnaire dans l'ordre juridique communautaire*, Bruxelles, Bruylant, 2010 p.242.

[101] RITLENG D., « Le juge communautaire de la légalité et le pouvoir discrétionnaire des institutions communautaires », *AJDA*, n° 9, 1999, pp.645–657.

[102] *Ibidem*.

[103] CJEU 17 June1965, *Italy/European Commission*, C-32/64, EU:C:1965:61.

[104] CJEU 6 November 2008, *The Netherlands/European Commission*, C-405/07, EU:C:2008:613.

decision-makers have complied with the procedural obligations governing the application of this principle. Therefore, the review of the legality of the decision-makers' action becomes a review of the procedural content of the precautionary principle. By verifying that the authorities have complied with these obligations, the Court can examine whether the elements of fact and law on which the exercise of the discretionary power depends are present, and therefore whether the precautionary principle has been correctly applied.

Conclusion

By acknowledging the flexible and complex nature of the precautionary principle, which — as a typical post-modern principle — escapes any attempt of systematisation based on linearity and simplicity, the purpose of this paper was to give a polycentric interpretation of this principle. This interpretation makes it possible to "order the multiple" without reducing it to unity. The challenge I have taken up has been to move from a simple to a complex form in the interpretation of the precautionary principle. This is not an easy objective to achieve. The construction of an ordered but polycentric definition of the precautionary principle requires a double challenge.

On the one hand, I should not resign to the plurality of the precautionary principle's applications — which would be tantamount to accepting that this principle constitutes a disordered mosaic of norms. On the other hand, I should not try to frame this principle within a static definition — which would lead to disregarding its dynamic nature. The interpretation of the precautionary principle that I drew is based on diversity rather than uniformity. It looks for the *multiplex unitas* among the different definitions and applications of this principle.

The core claim of this paper was that the polycentric interpretation of the precautionary principle could be built on two concepts: anticipation and action that represent the two main *knots* of the conceptual network of the precautionary principle. These *knots* are not isolated, but they are linked to other *knots* that constitute the main concepts allowing identifying and applying the precautionary principle under EU law. In the first part of this paper, I argued that anticipation implies the qualification by law and the evaluation by the science of uncertain risks. In the second part, I considered that, after having anticipated the time of action, decision-makers should act based on the precautionary principle. However, the action undertaken has different meanings and consequences from the procedural and substantive perspective. From the procedural side, the decision-makers should take into account this principle, while they remain free, on the substantive side, to adopt a precautionary measure.

While the study carried out here has shed light on one phase in the evolution of the precautionary principle under EU law, it is likely that, given its dynamic nature, this principle will continue to evolve. However, the direction of this transformation is difficult to predict, since it will depend mainly on the use that will be made of the precautionary principle in each political and social context. Although it is not easy to identify its development, two trajectories of change are, however, conceivable. By excluding the hypothesis of a *regression* in the application of the precautionary principle — which would lead to a reappraisal of the achievements of this principle — its evolution could take the form of *preservation* or even a *progression*. On the one hand, in the event of preservation, the traditional boundaries of application of the precautionary principle, as mentioned in this paper, would be maintained. On

the other hand, in the case of a progression, the use of this principle could be pushed towards new frontiers. Whether the evolution of the precautionary principle takes the form of preservation of the *status quo* or a progression, the polycentric interpretation developed in this study could prove useful. In the first case, this interpretation could facilitate both the definition and the application of this principle. Faced with an uncertain risk threatening the environment and public health, decision-makers could more efficiently, by referring to the *knots* that make up the network of the precautionary principle, know if and how to act in the case at stake. In this perspective, the network of the precautionary principle could be a reference model indicating to the decision-makers among the various possible options, those that have already been identified within this network. In the hypothesis of a progression in the use of the precautionary principle, the network *woven* in this study could be used as a starting point for the development of other *knots* representing the new possible applications of the precautionary principle. In this sense, the challenge would be to test, from both a theoretical and practical point of view, the adaptability of the precautionary principle network to the challenges posed by the progression of this principle.