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knots and the links of its network**

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Abstract

By acknowledging the flexible and complex nature of the precautionary principle under EU law and by referring to methodological pluralism, the goal of this paper is to provide a polycentric interpretation of this principle based on diversity rather than uniformity. The polycentric interpretation is anchored in the construction of the network of the precautionary principle. This allows for the *unitas multiplex* between the different definitions and applications of this principle to be identified and assessed. The core claim of this paper is that the polycentric interpretation of the precautionary principle can be built on two concepts: anticipation and action that represent the two main knots of its network. These knots are not isolated, but they are connected via some links to other knots that constitute the main concepts allowing identifying and applying the precautionary principle under EU law.

Keywords

Precautionary principle, post-modern law, methodological pluralism, network, European Union law.

1. Introduction

Provided for by article 191 para. 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 the United Kingdom/Commission* judgments of 5 May 1998,¹ the Court of Justice of the European Union (“CJEU”) has also repeatedly applied the precautionary principle in the field of public health.² 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.³ Due to its diverging interpretations and applications, the precautionary principle remains largely misunderstood, and decision-makers often neglect its implementation in the most sensitive cases concerning the protection of the environment and public health.⁴ This is of the utmost importance since a timely and proper use of the precautionary principle could avoid bearing (or, at least, reducing) the health, but also the environmental, social, political and economic consequences of the major risks threatening today our planet.

Against this backdrop, the core claim of this paper is that to foster the application of the precautionary principle, it is necessary to make a methodological shift in the way in which this principle is interpreted under EU law. This methodological shift shall be based on the acceptance of the post-modern nature of the precautionary principle and – according to the insights of methodological pluralism – shall aim to the construction of its network.⁵ The identification of the network of the precautionary principle is important because it allows mastering the flexibility and complexity of this principle (which is typical of post-modern principles) by avoiding two significant pitfalls belonging to the traditional interpretations of this principle. On the one hand, it avoids resigning to the plurality of its applications (which would be tantamount to accepting that the precautionary principle is a disordered mosaic of norms that cannot be appraised by a unique legal framework); on the other hand, it avoids framing precaution within a static definition (which would result in a disregard for the fundamentally dynamic nature of this principle). Instead, the construction of the network allows the formulation of a polycentric interpretation of the precautionary principle that makes it possible to order the multiple without reducing it to unity. In this regard, the network that I will present in this paper can be used as a *compass* indicating to decision-makers and legal scholars the *paths* that guarantee that recourse to the precautionary principle is in line with both its flexible and complex nature and the rules of EU law that frame it.

In this regard, in Section 2, I explain the theoretical foundation of the network by focusing on the postmodern nature of the precautionary principle and use of the methodological pluralism. In Section 3, I highlight the functioning of the network by examining some of its main knots and

¹ CJEU 5 May 1998, *National Farmer’s Union*, C-157/96, EU:C:1998:191; CJEU 5 May 1998, *United-Kingdom/Commission*, C-180/96, EU:C:1998:192.

² 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.

³ N. MOLFESSIS, « Préface », in D. TAPINOS (eds), *Prévention, précaution et responsabilité civile. Risque avéré, risque suspecté et transformation du paradigme de la responsabilité civile*, Paris, L’Harmattan, 2008, p. 9.

⁴ See: A. DONATI, « Le principe de précaution: un outil de gestion des crises en droit de l’Union européenne », *JTDE*, 2020, n° 10, pp. 430-36 for an analysis of the non-application of the precautionary principle in relation to the re-authorisation of glyphosate in 2017 by the EU Commission and in the framework of the 5G regulation as well as for a critical assessment of its late application during the Covid-19 crisis.

⁵ For a detailed analysis of the precautionary principle’s network see: A. DONATI, *Le principe de précaution en droit de l’Union européenne*, Bruxelles, Bruylant, 2021.

links. Section 4 concludes. To support the reader in understanding the network, Annex A (Tables I, II and III) provides for a graphical representation.

2. The foundation of the network

In this Section, I first demonstrate why the precautionary principle can be considered as a paradigmatic principle of postmodern law (2.1) and then I analyse the use of methodological pluralism to build its network (2.2).

2.1 The postmodern nature of the precautionary principle

The theoretical background of the network of the precautionary principle is rooted in its definition as a principle of post-modern law. 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.⁶ These transformations are of such magnitude that one may speak of 'genetic mutation' of modern society.⁷ 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'.⁸ 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 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. The circular nature of post-modern law supersedes the hierarchical nature of modern law. The State loses its monopoly in elaborating 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.⁹ This means that under post-modernity, governments no longer monopolize regulation, which is not monolithic, but rather an unsystematic collage of inconsistent and overlapping parts.¹⁰ This does not mean that post-modernity marks the transition from order to disorder. 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.¹¹ 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*).¹² The *vague* nature of a principle is perceived as a result of the

⁶ Hassan Abdelhamid, 'Les paradigmes post-modernes et la démarche pluraliste dans la recherche juridique' in Ghislain Otis (eds), *Méthodologie du pluralisme juridique* (Karthala, 2012), 139.

⁷ Gustavo Zagrebelsky, *Le droit en douceur (Il diritto mite)* (Economica, 2000), 35.

⁸ François Lyotard, *The postmodern condition*, (Manchester University Press, 1979).

⁹ Marc Galanter, 'Justice in many rooms: Courts, private ordering and indigenous law', (1981) 13 19 *Journal of Legal Pluralism and Unofficial Law*, 1-47.

¹⁰ Julia Black, 'Decentring regulation: Understanding the role of regulation and self-regulation in a post-regulatory world' (2001) 54 *Current Legal Problems*, 103-46.

¹¹ Jacques Chevallier, 'Vers un droit post-moderne ? Les transformations de la régulation juridique', (1998) 3 *Revue du droit public et de la science politique*, 674.

¹² Mireille Delmas-Marty, 'Où va le droit ? Entre pot au noir et pilotage automatique, le droit peut-il nous guider vers une mondialité apaisée ?', (2018) 14 *La Semaine Juridique*, 677.

lack of precision in the law.¹³ The texts create areas of uncertainty and indeterminacy without indicating the conditions for the application of the norm.¹⁴ 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.¹⁵ Article 191 para. 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 refers simply 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. *Softness* refers to the binding nature of the legal norm.¹⁶ 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.'¹⁷ From this perspective, the precautionary principle is a soft principle. Even if today, a large majority of the doctrine recognizes that the precautionary principle is a binding legal principle,¹⁸ its binding force is weak, and it is limited to the procedural side.¹⁹ 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.²⁰ Precaution is a gentle principle insofar as it is not easy to punish its violation; decision-makers enjoy broad discretion in its application.²¹ 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 characterizing the precautionary principle, the judge refuses to substitute his assessment of factual elements for that of the decision-makers and limits his control.²²

According to Edgard Morin, complexity is a fabric of heterogeneous constituents inseparably associated.²³ Complexity is not the opposite of simplicity but uni-dimensionality: complexity is what cannot be summarised in a single word, what cannot be reduced to a simple idea.²⁴ 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. The 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. Analyzing the precautionary principle involves addressing the relationship between

¹³ Mireille Delmas-Marty, *Le flou du droit*, (PUF, coll. « Les voies du droit ») 1986.

¹⁴ Jacques Chevallier, 'Vers un droit post-moderne ? Les transformations de la régulation juridique', *op. cit.*, 677-79.

¹⁵ Elizabeth Fisher, 'Opening Pandora's box: contextualizing the precautionary principle in the European Union' in Michelle Everson and Ellen Vos, *Uncertain Risks Regulated* (Routledge-Cavendish, 2012), 23-4.

¹⁶ Mireille Delmas-Marty, 'Où va le droit ? Entre pot au noir et pilotage automatique, le droit peut-il nous guider vers une mondialité apaisée ?', *op. cit.*, 677.

¹⁷ Jacques Chevallier, 'Vers un droit post-moderne ? Les transformations de la régulation juridique', *op. cit.*, 677-78.

¹⁸ Nicolas De Sadeleer, *EU environmental law and the internal market*, (Oxford University Press, 2014), 41; Chris Hilson, 'Rights and principles in EU law: a distinction without foundation', (2008) 15 8 *MJ*, 193-216; Gerd Winter, 'The legal nature of environmental principles in international, EC and German law', in Richard Macrory (eds), *Principles of European environmental law* (Europa Law, 2004), 19-22.

¹⁹ On the procedural binding force of the precautionary principle, see Alessandra Donati, *Le principe de précaution en droit de l'Union européenne*, (Larcier, 2021), 182-202.

²⁰ Mireille Delmas-Marty, 'Où va le droit ? Entre pot au noir et pilotage automatique, le droit peut-il nous guider vers une mondialité apaisée ?', *op. cit.*, 680.

²¹ European Commission, *Communication of the Commission on the precautionary principle*, COM (2000)1 final, 15.

²² GC, 17 February 1998, *Pharos SA/Commission of the European Communities*, T-105/96, EU:T:1998:35, 69.

²³ Edgar Morin, *Introduction à la pensée complexe* (Éditions du Seuil, 2005), 21.

²⁴ *Ibidem*.

law and science; between law and political science, it also explains 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 policy-makers. 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. Without the input of scientific experts, decision-makers would not be able to operationalize the precautionary principle. However, experts would be limited to a scientific risk assessment without the means to adopt a protection measure at the political level without policy-makers.

The post-modern nature of the precautionary principle is particularly evident under EU law, which justifies the choice made in this paper to focus on EU law. For Jacques Chevallier, EU law is a privileged place for the emergence of the new figures of post-modernity.²⁵ Marked by pluralism, due to the same modalities of European construction and its institutional balances, EU law is a flexible and complex legal system. On the one hand, because of its definition as a process creating an ever-closer union among the peoples of Europe (Article 1 TEU), the construction of Europe remains a work in progress that is subject to acceleration and delay.²⁶ On the other hand, the influence of EU law is progressively extending to the national laws of the Member States, contributing to the creation of a tangle of competencies that evoke the regulatory logic of the networked figures characteristic of post-modern law.²⁷ EU law is also conceived in its substance as a post-modern law. For François Ost and Michel Van de Kerchove, Europe is about objectives to be achieved, policies to be pursued, and actions to be developed before being a set of rules and an institutional mechanism capable of bringing them to fruition²⁸. EU law is therefore adaptable. Within the European network, unity and diversity coexist, with many factors of differentiation (outlining the contours of a variable-geometry Europe) being combined with commonalities and elements of stability. From this point of view, the post-modern nature of EU law acts as a lever to accentuate the characterization of the precautionary principle as a post-modern principle.

2.2 The use of methodological pluralism

Against this backdrop, which methodology shall be used to analyze the precautionary principle and support the envisaged shift in the interpretation of this principle? The choice that I make is to refer to methodological pluralism.²⁹ 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.³⁰ 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 analyze 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.³¹ In other words, lawyers shall seek the commonalities within the

²⁵ Jacques Chevallier, 'Towards a post-modern law? Les transformations de la régulation juridique', *op. cit.*, 672.

²⁶ François Ost and Michel Van De Kerchove, *De la pyramide au réseau ? Pour une théorie dialectique du droit* (Publications des Facultés universitaires Saint-Louis, 2002), 71.

²⁷ François Ost and Michel Van De Kerchove, *De la pyramide au réseau ? Pour une théorie dialectique du droit*, *op. cit.*, 65.

²⁸ François Ost and Michel Van De Kerchove, *De la pyramide au réseau ? Pour une théorie dialectique du droit*, *op. cit.*, 72.

²⁹ G. OTIS (eds), *Méthodologie du pluralisme juridique*, *op. cit.*

³⁰ I. LOMAKINA, « Aspects méthodologiques du droit coutumier à la lumière des paradigmes classiques et non classiques », *Revue Droit et Cultures*, 2005, n° 50, pp. 49-63.

³¹ E. MORIN, *Introduction à la pensée complexe*, *op. cit.*, p. 104.

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.³² It is based on diversity rather than uniformity.³³ Methodological pluralism takes the network metaphor used to describe post-modern law and applies it to the lawyer's work³⁴. The etymology of the term network, from the Latin *retis*, refers to the idea of a net.³⁵ The use of the term evokes a textile metaphor. The network is a *weft* made up of elements described as *knots* connected by *links* that ensure their interconnection and interaction.³⁶ The network is, therefore, an open structure where coordination between knots is accompanied by a certain instability: the order within the network is temporary, it is an order in motion; the links between knots may, depending on the time, take on different forms. Law becomes relational insofar as its interpretation and application rely on the links woven between the knots of the network.³⁷

The core claim of this paper is that to research the *unitas multiplex* between the different interpretations and applications of the precautionary principle under EU law, it is possible to weave its network by identifying the *knots* and the *links* of its *weft*. To weave the network of the precautionary principle, it is necessary to determine the knots and links that compose the network (2.2.1) and identify the dynamics that ensure their connection within the network (2.2.2).

To do so, I refer to the theory of *nodal governance* developed by Scott Burris, Peter Drahos and Clifford Shearing.³⁸ According to these authors, the theory of nodal governance is a ramification of post-modern theories aimed at describing the functioning of social systems (including the legal system) in the form of a network. However, it departs from these theories for its specific interest in the functioning, within the network, of the knots. From this perspective, the nodal governance theory aims to provide a more comprehensive characterization of the knots than the one formulated in traditional network theories.³⁹ In this way, by looking more closely at the knots of the network, Scott Burris, Peter Drahos, and Clifford Shearing develop a new theory that explains the functioning of networks in greater depth. For the three authors, a knot is an instrument of governance, where by 'governance' they mean the management of the course of events in a social system in a vast sense.⁴⁰ A knot is, therefore, an instrument of action (e.g. political, legal, economic or military action) which, in each social system, makes it possible to manage the network.⁴¹ A knot can take many forms, ranging from governmental agencies to businesses, neighbourhood associations and NGOs. In this regard, knots represent a central and stable element of the network that allows managing it based on the available knowledge, structures and resources.

My work takes its roots in this framework. It aims to apply the theory of nodal governance to studying the network of the precautionary principle under EU law. The specificity of the legal context (compared to the social systems understood broadly by Scott Burris, Peter Drahos and Clifford Shearing) and the object of analysis (the functioning of the network of the precautionary

³² P. GROSSI, *Novecento giuridico : un secolo pos-moderno*, in P. GROSSI (eds), *Introduzione al Novecento giuridico*, Roma, Laterza, 2012.

³³ J. CHEVALLIER, « Vers un droit post-moderne ? Les transformations de la régulation juridique », *op. cit.*, p. 673.

³⁴ H. BAKIS, *Les réseaux et leurs enjeux sociaux*, Paris, PUF, 1993; R. BOULET, C. LAJAUNIE and P. MAZZEGA (eds.), *Law, Public Policies and Complex Systems: Networks in action*, Cham, Springer, 2019.

³⁵ L. CASTIGLIONI and S. MARIOTTI, *Il Vocabolario della Lingua Latina*, Torino, Loescher, 2008, p. 1208.

³⁶ H. BAKIS, *Les réseaux et leurs enjeux sociaux*, *op. cit.*, p. 24.

³⁷ E. JEULAND, *Théorie relationiste du droit*, Paris, LGDJ, 2016.

³⁸ Scott Burris, Peter Drahos and Clifford Shearing, 'Nodal Governance', (2005) 30 *Australian Journal of Legal Philosophy*, 30-58.

³⁹ For a more traditional network theory, see for example: Manuel Castells, 'Materials for an exploratory theory of the network society', (2008) 51 1 *British Journal of Sociology*, 15.

⁴⁰ *Ibid.*, 30.

⁴¹ *Ibid.*, 37-8.

principle) justifies the modifications of the basic theory that I made. The theory thus remains on the background of my research, but, as will be shown below, it has been freely adapted to take into account the characteristics of the precautionary principle. Moreover, the precautionary principle's network is not only composed of knots but also of links that connect the knots and ensure their interaction. Therefore, by adding a brick to the theory of nodal governance (which is limited to analyzing the place of knots within the network), I identified the main features of the links that compose the network of the precautionary principle.

2.2.1 The identification of the knots and the links

The knots

The knots of the precautionary principle correspond to the key concepts that make it possible to identify this principle. The construction of the *unitas multiplex* presupposes the establishment of stable points in the interpretation of the precautionary principle around which to build a network. As in the nodal governance theory, the knots are therefore at the heart of the precautionary principle's network; they guarantee its stability and functioning. If for Scott Burris, Peter Drahos, and Clifford Shearing, the knots are instruments of action that ensure the management of the network through the implementation of political, legal, economic, military rules, etc., the knots of the precautionary principle are points of legal action. Indeed, each knot reveals an aspect of the precautionary principle as interpreted and applied under EU law and contributes to the weaving of its legal framework.

To determine the knots of the precautionary principle, it was first necessary to collect and analyze all its multiple sources. Therefore, by using the website <http://curia.europa.eu>, I examined the conclusions of the Advocates General and the judgments and orders of the CJEU containing a reference to the precautionary principle between 1991 (the year of the first cases mentioning the precautionary principle) and December 2021 (the date of the last update). I conducted the same analysis (and for the same period) for the EU legislation (regulations, directives, decisions, communications, opinions, etc.) via the website <http://eur-lex.europa.eu>. I also analyzed the main contributions of the scholarship on the precautionary principle. The result is a heterogeneous landscape that reflects a great variety in the interpretation and application of the precautionary principle. To overcome the disorder that emerges, it was necessary, in a second step, to identify some constant elements that can be understood as common denominators of the different interpretations and applications of this principle. These constant elements correspond to the knots of the precautionary principle. I then proceeded empirically to their identification. To do so, in line with the theory of nodal governance, I realized a conceptual work of aggregation and disaggregation of the precautionary principle's components. First, I identified the macro-concepts that make it possible to understand the scope of the precautionary principle. Thus, for example, I extrapolated the concepts of *qualification by law of uncertain risks* and *evaluation by science of uncertain risks*, and I added them to the network of this principle. In a second step, I decomposed these macro knots to study them. For each of the macro knots, I tried to define their components. For example, the study of the concept of *qualification by the law of uncertain risks* allowed me to identify the *elements* and *objectives* of this qualification. In the same vein, the study of the *elements* revealed that these are the *risk* and *uncertainty*. Furthermore, in a *crescendo* of decomposition, inherent to an increasing degree of conceptualization, I realized that the *risk* could be disaggregated into two separate concepts: a *real risk* and a *serious risk*. The first refers to the mathematical and scientific dimension of risk, the second to its social and political nature. In successive stages, I conducted the same work of breaking down the concept for all the knots of the precautionary principle. The process resulted in a disordered set of key concepts representing the knots of the precautionary principle' network. However, it is not enough to detect the knots of the network, it is also necessary to trace the links that

connect them.

The links

Within the precautionary principle's network, the coordination between the knots is ensured by the links. Links are information vehicles that indicate the quality and quantity of data available on the interactions between the knots of the precautionary principle based on its different sources. The analysis of the links allows understanding whether the relationship between two knots is established and the degree of confidence that can be assigned to this interaction considering the available information. For example, examining the relationship between the knot *real risk* and the knot *risk* is important for two reasons. First, it allows assessing whether, given the information from the available sources (EU legislation, CJEU rulings, doctrine), the concept of real risk is connected to that of risk in the precautionary principle's network. In this case, their interaction is based on the recognition of the real risk as a characteristic of the risk that triggers the application of the precautionary principle. Second, examining the link between *risk* and *real risk* allows verifying the degree of confidence that can be placed in this relationship: do the EU legislator and the CJEU consistently recognize the existence of a link between these concepts? Is the definition of risk as a real risk generally accepted by the doctrine? Depending on the answer to these questions, one could consider that the *strength* of the link between two knots is not the same since these knots do not interact with the same intensity.

To study the strength of the links, I referred to the work of the sociologist Mark Granovetter who, in analyzing social relationships in different groups, distinguishes between strong, weak and absent links.⁴² According to the sociologist, the main criteria for assessing the strength of a link are the following: the amount of time invested in establishing and maintaining the link, the emotional intensity conveyed through this tie, the degree of mutual trust that arises from it, and the number of activities or services exchanged through this bond.⁴³ Borrowing the terminology used by Mark Granovetter, I identified strong, weak and absent links within the precautionary principle's network. In this respect, Mark Granovetter's work on the strength of ties was the starting theoretical anchor for my study on the ties of the precautionary principle. Nevertheless, I loosely adjusted his theory to consider the specificity of the object of my study. My goal was not to evaluate the strength of a social relationship but to test the strength of the link between two knots of the precautionary principle. Therefore, the criteria for establishing whether a link is strong, weak or absent do not overlap with those used by Mark Granovetter, but are based on the quality and quantity of information available concerning the interactions between the knots of the precautionary principle.

Based on these criteria, I first considered that a link is *strong* when a lot of information is available, and there is a convergence between the sources (legislation, case-law and legal scholarship) of the precautionary principle as to the relationship established between two knots of this principle. For example, the relationship between *risk* and *real risk* is strong since it is generally recognised by the CJEU and by the majority of the doctrine that the risk justifying recourse to the precautionary principle is a real risk that is assessed by scientific experts through a risk assessment. Second, I qualified a link as *weak* when the sources of the precautionary principle are not numerous and/or do not fully converge in the interpretation or application of certain knots. For example, the link between the knots *obligation to take into account the precautionary principle* and the *costs and benefits of the action* is weak because there are divergences both in the scholarship and in the case law as to the determination of the conditions for implementing a cost and benefit analysis prior to the adoption of a

⁴² Mark Granovetter, 'The strength of weak ties', (1978) 78 6 *American Journal of Sociology*, 1360-80.

⁴³ *Ibidem*.

precautionary measure. Third, I considered a link as *absent*, when the connection between two knots of the precautionary principle is not established. In this respect, I did not limit myself to observing the absence of a link, but I tried to identify among the absent links those that it would be desirable to create. For example, while it is usually accepted that the precautionary principle serves to protect the environment and public health, its use to protect future generations is not among its common applications. However, this is a development that could be considered desirable insofar as the precautionary principle is aimed at the long term and the risks it seeks to prevent may occur in this generation as well as in future generations. Therefore, the link between the *objectives* of the precautionary principle and the *protection of future generations* remains to be constructed and is conceived as an absent link that should be established.

The distinction between strong, weak and to-be-built links is important since the connection between the knots of the precautionary principle depends on the strength of its links. Therefore, my analysis of the knots varied according to the strength of the links connecting these knots. Borrowing the vocabulary used by Mireille Delmas-Marty, I distinguished between a work consisting of *coordination*, *harmonization* or *unification* of knots.⁴⁴ Where the link is strong, the weaving of the precautionary principle that I carried out consisted of *coordination* between its sources aimed at highlighting and articulating coherently the terms in which the scholarship and the Court conceive the relationship between the knots of the precautionary principle. When the link is weak, *i.e.* when the relationship between the knots is not fully established, coordination would not be sufficient because it would be limited to the observation of the (at least partial) lack of connection between the knots. To overcome this gap and re-establish the link between knots, I made a *harmonization* work. As Mireille Delmas-Marty points out, to harmonize originally distinct elements, one must look for something common, a common measure.⁴⁵ Harmonization is situated between the *impossible isolation* and the *impossible unification*. It aims to respect the differences while allowing their harmonious expression.⁴⁶ The purpose of harmonizing the knots of the precautionary principle is, therefore, to seek common elements to them, which, without erasing their differences, can enable their linkage within the network of the precautionary principle. Where the link is to be constructed, I carried out a *unification* work. In this case, it was necessary to overcome the gaps of legal regulation and build a link between two knots by establishing how and why previously disjointed concepts should be linked within the precautionary principle's network.

The result of my work on the knots and the links that represent the weft of the network of the precautionary principle is set forth under Annex A hereto.

2.2.2 The dynamics between the knots and the links

To describe the dynamics of the precautionary principle's network, I referred to a metaphor borrowed from the *hub and spoke* theory commonly used in computer science and transport.⁴⁷ Unlike the ring network model (where knots are connected in a chain to each other), in the precautionary principle's network, the knots are not all linked to each other but, as shown in Annex A, they are connected to two *hubs*.

The polycentric interpretation of the precautionary principle that I am looking for can be built

⁴⁴ Mireille Delmas-Marty, *Le pluralisme ordonné* (Éditions du Seuil, coll. « La couleur des idées », 2006).

⁴⁵ *Ibid.*, 93.

⁴⁶ *Ibidem*.

⁴⁷ Maxim Lachmann, *Hub and Spoke vs point-to-point in airline logistics. The network strategy of Lufthansa* (GRIN Publishing, 2016); James K. Elrod and John L. Fortenberry, 'The hub-and-spoke organization design: an avenue for serving patients well', (2017) *BMC Health Services Research*, 25-33.

on two concepts that can be understood as the two main knots of the precautionary principle: anticipation and action. Anticipation and action represent the two hubs, *i.e.* the two central connection points that govern the circulation between the knots of the precautionary principle (see Annex A (Table I)). The link between anticipation and action is strong. On the one hand, anticipation is the *sine qua non*-condition of action. Action based on the precautionary principle presupposes the anticipation by decision-makers of the time for action by taking into account uncertain risks. On the other hand, action is the necessary consequence of anticipation. Although decision-makers have anticipated the time for action by taking into account uncertain risks, without an action based on the precautionary principle, the occurrence of these risks could not be prevented or managed. Thus, the objective of a high level of environmental and public health protection could not be achieved.

In the precautionary principle's network, the hubs, anticipation and action, are connected *via* links to other knots. The precautionary principle's network can therefore be separated into two different networks originating, respectively, in the anticipation and action hubs (see Annexe A, Tables II and III). In each of these two networks, the flow is similar, and it follows the dynamics of the *hub and spoke* model. The advantage of this model over the ring model is that it reduces the fragmentation of the network while facilitating its legibility and promoting circulation within it. It is easier to design international travel routes with a small number of large airports that function as hubs for smaller ones, rather than planning travel routes that include all airports regardless of their size and location. Similarly, if all the knots of the precautionary principle were linked, it would be more difficult - due to the increased complexity of the network - to search for the *unitas multiplex* among the different definitions and applications of this principle. Therefore, the construction of a network according to the *hub and spoke* model allows to better identifying the primary connections and crossing points that correspond to the key concepts and relationships that define the precautionary principle under EU law.

3. The functioning of the network

The purpose of this Section is to give a general overview of the functioning of the precautionary principle's network by examining its main knots and links. It is out of its scope to give an exhaustive explanation and a critical assessment of all the knots and the links that, according to Annex A, compose its network.⁴⁸ Based on the dynamics of the network that I described above, I first describe the functioning of the network originating in the hub *anticipation* (3.1) and then I focus on the one belonging to the *action's* hub (3.2).

3.1 Anticipation

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.⁴⁹ Therefore, decision-makers shall act as soon as

⁴⁸ For an exhaustive explanation and a critical assessment of all the knots and the links that compose the network of the precautionary principle, please refer to Alessandra Donati, *Le principe de précaution en droit de l'Union européenne*, *op. cit.*

⁴⁹ Christine Noiville, 'Science, décision, action : trois remarques à propos du principe de précaution', (2004) *LPA*, 10.

possible to avoid the occurrence of 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 of 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.⁵⁰ 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. In this regard, it can be argued that uncertain risks shall meet two requirements. They shall have a legal basis and a scientific foundation. This means that uncertain risks shall be qualified by law and evaluated by science. *The qualification by law* (3.1.1) and the *evaluation by science* (3.1.2) are the two main knots in the precautionary principle's network that allow us to grasp the meaning and functioning of this principle as a principle of anticipation. The intensity of their link is weak because the sources of the precautionary principle do not converge as to the interpretation and application of these knots.

3.1.1 The qualification by law of uncertain risks

Since the introduction of the precautionary principle under EU law in 1992, the CJEU has *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.⁵¹ As a legal category, the CJEU attach specific legal consequences to uncertain risks: the obligation for the decision-makers to take into account the precautionary principle. The legal category of uncertain risks has specific features from both the material and the teleological points of view. Therefore, I analyzed the elements that have been legally qualified and the purpose of this qualification. Since the sources of the precautionary principle are often incomplete and do not converge in their interpretation, the knots *elements* and *goals* are weakly linked to the knot *qualification by law of uncertain risks*.

Elements

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.⁵² This means that the condition for the application of the precautionary principle is the existence of risk and of uncertainty. *Risk* and *uncertainty* are the two knots connected to the knot *elements of the qualification of uncertain risks*. Their links are strong. Indeed, risk and uncertainty are unanimously conceived as the two requirements for applying the precautionary principle.

Goals

The legal qualification of uncertain risks meets the objective of protecting the planet and preserving the quality of its environment. To achieve this goal, it is necessary to anticipate the time for action in the face of the risks that threaten it at the stage of uncertainty. This is of the utmost importance considering the multiplication (in number) and increase (in magnitude) of adverse climatic phenomena and risks to the environment and public health that we know today. Floods, droughts, earthquakes, hurricanes, fires, famines, water shortages, melting ice,

⁵⁰ Nicolas De Sadeleer, *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* (Bruylant, 1999), 250-51.

⁵¹ CJCE 23 sept. 2003, *European Commission/Kingdom of Denmark*, 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.

⁵² CJEU 5 May 1998, *National Farmers' Union and others*, C-157/96, *prec.*; CJEU 5 May 1998, *United Kingdom/European Commission*, C-180/96, *prec.*; GC 11 September 2002, *Pfizer Animal Health/Council*, T-13/99, EU:T:2002:209.

loss of biodiversity, development of diseases linked to pesticides, pandemics are increasingly recurrent events. The health and environmental risks threatening the planet have reached such a scale that, in its report published on 8 October 2018, the IPCC (Intergovernmental Panel on Climate Change) announced that humanity has few years left to act to preserve living conditions on Earth⁵³. Faced with these major challenges, what shall EU law do, based on the precautionary principle, to prevent as much as possible to the occurrence of such major risks?

On the one hand, under Articles 168 para. 1 and 191 para. 2 TFEU, public decision-makers have an obligation to ensure a high level of protection of public health and the environment. In view of the consensus in case-law and scholarship on the application of the precautionary principle for the protection of the environment and public health, the link between the knot *protection of the environment and public health* and the knot *goals* of the protection is strong. On the other hand, I evaluated the possibility of conceiving a new obligation for decision-makers, that of protecting future generations by guaranteeing their right to enjoy a healthy environment. The novelty of this reflection and the absence of solid reference points (legislative, jurisprudential or doctrinal) explain the weak nature of the link between the *protection of future generations* and the *goals* of protection within the precautionary principle's network. Indeed, this objective is not clearly enshrined in the European treaties but can be indirectly inferred from the obligation of decision-makers to promote sustainable development that meets the needs of the present generation without compromising the ability of future generations to enjoy a healthy environment. Moreover, for some authors,⁵⁴ the protection of future generations through the concept of sustainable development is not sufficient, which is why they propose to reflect on the construction of a law of future generations anchored on the obligation of the present generation to protect and on the right of future generations to be protected. This would be a new link to be established in the precautionary principle's network.

3.1.2 The evaluation by 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. Despite its importance for the application of the precautionary principle, the procedure for carrying out 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 of uncertain risks has not yet been formulated. To fill this gap, I identified who are the experts in charge of the expertise and which are the modalities for its execution. Given the limited information available on the identification of the *experts* and the characteristics of the *expertise*, the links between these knots and the knot *evaluation by science of uncertain risks* are weak in the precautionary principle's network.

Experts

An expert is a man of the art called upon to give his/her opinion on a question falling within his/her competence.⁵⁵ The expert, chosen in light of his/her technical skills, intervenes in the investigation of a case to enlighten the decision-maker on technical or scientific facts. The

⁵³ IPCC, *Global warming of 1.5° C., Summary for policy-making*, October 2018.

⁵⁴ Emilie Gaillard, *Générations futures et droit privé. Vers un droit des générations futures* (LGDJ, 2011), 359; Christine Thibierge, 'Avenir de la responsabilité, responsabilité de l'avenir', (2004) 9 *Recueil Dalloz*, 577-82; Laurent Neyret, *Atteintes au vivant et responsabilité civile* (LGDJ, 2006).

⁵⁵ Claude Grellier, 'Regard judiciaire sur l'impartialité de l'expertise', in Béatrice Parance (eds), *Santé et environnement. Expertise et régulation des risques* (CNRS Éditions, 2017), 89.

breadth of the definition of expert explains why it is difficult, if not impossible, to draw up an exhaustive list of all the experts who can provide scientific expertise. For each question, several experts mobilizing different scientific or technical knowledge could be appointed. The difficulty of identifying experts is even more marked when they have to assess the existence of uncertain risk. The occurrence of such a risk may result from a multitude of factors and, depending on the case, concern several products or substances in the fields of the environment and public health. Moreover, the risks to be assessed are usually very complex and specific and require the mobilization of highly specialized expertise.

Given the difficulty of identifying the experts, it is important to understand the conditions they shall respect to carry out their duties. In this respect, my analysis of the existing scholarship and case-law reveals that the experts shall respect two conditions, which are conceived as the minimum guarantees for the proper conduct of the expertise. First, they shall be separated from decision-makers.⁵⁶ The scientific assessment of uncertain risks shall be entrusted to experts who are functionally (and in the case of EU independent agencies also institutionally) separate from the authorities in charge of the risk management. Because of the broad consensus in the case-law and in the scholarship on the requirement of separation of experts, the link between the knot *separation* and the knot *experts* is strong within the precautionary principle' network. Second, experts must be independent, not only from the public authorities commissioning the expertise but also from third parties potentially affected by their work.⁵⁷ Due to the difficulty of identifying the most suited techniques to guarantee the independence of experts and the limited information available in this regard, the link between the knot *independence* and the knot *experts* is weak.

Expertise

The expertise on uncertain risks is scientific expertise with a political purpose.⁵⁸ It is commissioned by political decision-makers who, faced with an uncertain risk to the environment and public health, call on experts to assess the probability of the risk occurring and its seriousness from a scientific point of view. Unlike judicial expertise, the expertise for political purposes is not framed by specific procedural rules under EU law. In the network of the precautionary principle, the link between the *expertise* and the *evaluation by science of uncertain risks* is, therefore a weak one. However, the organization of the expertise is essential to ensure its legitimacy.⁵⁹ Against this backdrop, I researched the conditions that experts shall respect and the methods they shall follow in carrying out their work. Because of the incomplete and often contradictory nature of the sources aimed at framing the expertise of uncertain risks, the links between the knots *conditions* and *methods* and the knot *expertise* are weak within the precautionary principle's network. As to the conditions, based on the harmonization work that I conducted, I realized that the expertise should be of high quality and transparent. High-quality expertise should be based on the best available scientific data, it should be multidisciplinary and plural, and it should not jeopardize the minority opinions of the experts.⁶⁰

⁵⁶ On the separation of the experts see Alessandra Donati, *Le principe de précaution en droit de l'Union européenne*, op. cit., 135-476.

⁵⁷ On the independence of the expert see Alessandra Donati, *Le principe de précaution en droit de l'Union européenne*, op. cit., 147-56.

⁵⁸ Thomas Alam, 'Le rôle de l'expertise scientifique sur les ESST dans le processus d'action publique. Une comparaison franco-britannique', in Laurence Dumoulin et al. (eds), *Le recours aux experts. Raisons et usages politiques* (Presses Universitaires de Grenoble, 2005), 90.

⁵⁹ Jim Dratwa, 'Taking risks with the precautionary principle or how the uncertain is communicated', in Edwin Zaccai and Jean Noël Missa (eds.), *Le principe de précaution, signification et conséquences* (Éditions de l'Université de Bruxelles, 2000), 56.

⁶⁰ For more detailed information, see Alessandra Donati, *Le principe de précaution en droit de l'Union européenne*, op. cit., 159-70

The methods concern both the evaluation of the risk and the uncertainty. If the formers have been mainly harmonized by the EU Commission, the second are freely chosen by the scientific committee or agency in charge of the expertise.⁶¹

3.2 Action

The precautionary principle is not only a principle of anticipation; it is also an action principle. It imposes on the political decision-makers the responsibility to act without waiting for scientific certainty. 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 recognizes 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;⁶² in others, the Court considers that the precautionary principle *requires* the authorities to take measures for the protection of the environment and public health.⁶³ 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 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 analyze (3.2.1) the obligation to take into account the precautionary principle and the discretion to implement a precautionary measure (3.2.2). Within the network of the precautionary principle, the *obligation to take into account the precautionary principle* and the *discretion to implement a precautionary measure* constitute the two knots connected to the knot *action*. Considering the divergences (in the case-law and in the scholarship) and sometimes the gaps in the characterization of the obligation to take into account and the discretion to implement the precautionary principle, the links between these knots and the knot *action* are weak in the precautionary principle's network.

3.2.1 The obligation to take into account the precautionary principle

A careful reading of the EU secondary legislation containing a reference to the precautionary principle shows that the binding force of this principle must be interpreted as an *obligation to take it into account*.⁶⁴ Indeed, in these texts, whether it concerns the cross-border movement

⁶¹ For more detailed information, see Alessandra Donati, *Le principe de précaution en droit de l'Union européenne*, *op. cit.*, 171-76.

⁶² CJEU 22 December 2010, *Gowan Comércio Internacional and Servicios Lda*, C-77/09, EU:C:2010:803, 73; GC 12 April 2013, *Du Pont de Nemours (France) SAS and others/European Commission*, T-31/07, EU:T:2013:167135.

⁶³ CJEU 2 December 2004, *European Commission/The Netherlands*, C-41/02, EU:C:2004:762, 45 ; GC 26 November 2002, *Artegodan GmbH and others/Commission*, 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, EU:T:2002:283, 192 ; GC 21 May 2015, *Rubinum/European Commission*, T-201/13, EU:T:2015:311, 60.

⁶⁴ Regulation n° 1946/2003 of the European Parliament and of the Council of 15 July 2003 on transboundary movements of genetically modified organisms, [2003] OJ L 287; 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 [2001] OJ L 106; Directive n° 2008/98/CE of the European Parliament and of the Council of 19 November 2008 on waste [2008] OJ L 312; Directive n° 2009/48/CE of the European Parliament and of the Council of 18 June 2009 on the safety of toys, [2009] OJ L 170; 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

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'.⁶⁵ 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*. While the link between the knot *obligation to take into account the scientific expertise* and the knot *obligation to take into account the precautionary principle* is well established in the case-law of the Court and constitutes a strong link in the network of the precautionary principle, the link between the knots *obligation to take into account the pros and cons of the action* and the knot *obligation to take into account the precautionary principle* is weak. Indeed, there are divergences both in the case-law and in the scholarship as to the determination of the conditions for implementing a cost and benefit analysis prior to the adoption of a precautionary measure.

The obligation to take into account the scientific expertise

The obligation to take into account scientific expertise gives rise to a *duty of care* and a *duty of motivation*. Given the consensus as to the qualification of the duty of care and the duty of motivation, the links between these knots and the knot *obligation to take into account the scientific expertise* are strong in the precautionary principle's network. 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.⁶⁶ 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.⁶⁷ 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 stake⁶⁸. The duty of motivation is fulfilled if two conditions are met. The first condition relates to the object of the motivation and is not specific to the precautionary principle. As is the case for all other legal acts adopted by the EU institutions and the Member States within the scope of EU law, the motivation shall clearly and coherently set out the factual and legal elements on which the authority's decision is based.⁶⁹ The second condition concerns only the action taken by decision-makers based on the precautionary principle. If they decide to depart from the results of the scientific risk assessment, the motivation of the decision shall be of a scientific level at least equivalent to that of the opinion they departed from.⁷⁰

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

law, establishing the European Food Safety Authority and laying down procedures in matters of food safety [2002] OJ L 31; 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 [2012] OJ L 167.

⁶⁵ GC, 11 September 2002, *Pfizer Animal Health/Council*, T-13/99, *prec.*, 170-72.

⁶⁶ CJEU 21 November 1991, *Technische Universität München/Hauptzollamt München-Mitte*, C-269/90, EU:C:1991:438, 14; GC 11 September 2002, *Pfizer Animal Health/Council*, *prec.*

⁶⁷ GC 16 September 2013, *Animal Trading Company and others/ European Commission*, T-333/10, EU:T:2013:451.

⁶⁸ CJEU 11 July 2013, *French Republic/ European Commission*, C-601/11, EU:C:2013:465.

⁶⁹ CJCE 15 juillet 1970, *ACF Chemiefarma NV/Commission*, C-41/69, EU:C:1970:71.

⁷⁰ GC, 11 September 2002, *Pfizer Animal Health/Council*, T-13/99, *prec.*, 199.

The obligation to take into account the precautionary principle implies the duty of decision-makers to take into account, in addition to the results of the scientific expertise, the other pros and cons of the action. In the case *Bayer CropScience AG /European Commission* of 17 May 2018,⁷¹ the General Court explicitly recognized the binding nature of the pros and cons analysis and the obligation for the decision-makers to carry it out before adopting a precautionary measure. Yet, the General Court has not specified the modalities for executing the pros and cons analysis, which leaves decision-makers with a wide margin of discretion.⁷² For the EU Commission, this analysis is generally carried out via the implementation of a cost and benefit analysis.⁷³ Moreover, when the precautionary measure consists of a normative initiative of the Commission, this latter has undertaken in the guidelines for better a regulation, to carry out an impact assessment.⁷⁴ Given the broad discretionary power of the authorities and the hesitations of both the EU legislator, the Court and the scholarship as to the framework for the implementation of the pros and cons analysis, the links between the knots *cost and benefit analysis* and *impact assessment* and the knot *obligation to take into account the pros and cons of the action* are weak in the precautionary principle's network.

3.2.2 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 complex nature of the cases with which they are confronted and 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'.⁷⁵ 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.

Against this backdrop, the CJEU, called upon to verify the legality of the action of decision-makers and their potential non-contractual liability, 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.⁷⁶ Indeed, any more precise control could involve a dangerous shift in the dividing line between the judge and the

⁷¹ GC 17 May 2018, *Bayer CropScience AG/European Commission*, prec. This has been recently confirmed by the Court of Justice in the appeal, CJEU 6 May 2021, *Bayer CropScience AG and Bayer AG v European Commission*, C-499/18 P, EU:C:2021:367.

⁷² CJEU 13 March 2019, *Poland/European Parliament and Council of the European Union*, C-128/17, ECLI:EU:C:2019:194.

⁷³ European Commission, *Communication from the Commission on the precautionary principle*, op. cit, 19.

⁷⁴ European Commission, *Better regulation guidelines*, 7 July 2017, SWD (2017) 350, Toolbox 12, 73.

⁷⁵ Conclusions of the Advocate General J. Mischo, CJEU 23 September 2003, *European Commission/Kingdom of Denmark*, C-192/01, EU:C:2002:760, 103.

⁷⁶ GC 17 February 1998, *Pharos SA/European Commission*, T-105/96, EU:T:1998:35, 69.

administrator.⁷⁷ 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. In view of the abundance of sources (jurisprudential and doctrinal) that recognize the discretion of the decision-makers to define the scope of the precautionary measures and the limitation of control exercised by the CJEU, the links between the knots *scope of the precautionary measures* and control of the *precautionary measures* and the knot *discretion to implement a precautionary measure* are strong in the precautionary principle' network.

The scope of the precautionary measures

Even if the precautionary measures have an open and variable content, I analyzed the measures adopted between 1991 and 2021 to understand which measures have been more frequently adopted by the EU decision-makers. This analysis is not exhaustive, but it gives a general (even if uncompleted) overview of the way in which the precautionary principle has been applied. To carry out my analysis, I checked via the website www.curia.eu the precautionary measures that have been subject to a decision by the CJEU and via the website www.eurlex.eu those that have triggered a legislative measure by the EU institutions. As a result, I observed that the precautionary measures most frequently implemented belong to two categories. First, there are those concerning the authorization or the withdrawal of the authorization of dangerous activity or substance (drugs, pesticides, food additives, etc.). Second, there are those relating to managing an environmental or health crisis (mad cow crisis, Xylella crisis, Covid-19 etc.). While the application of the precautionary principle in the context of the authorization of activity is widely accepted, its use as a crisis management instrument raises significant doubts since the precautionary principle is often applied too late when it is no longer question to prevent the occurrence of risk (that has already occurred), but only to mitigate its effects or is neglected by the public authorities.⁷⁸ For these reasons, the link between the knot *authorization of activity* and the knot *scope of the precautionary measures* is strong. In contrast, the link between the knot *crisis management* and the knot *scope of the precautionary measure* is weak.

The control of the precautionary measures

The limitation of control concerns, first of all, the legality of the precautionary measures. In this case, the Court adopts a deferential approach and leaves the decision-makers a wide margin of discretion to decide on implementing the precautionary principle.⁷⁹ 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.⁸⁰ The limitation of control is also relevant to non-contractual liability litigation. The Court very rarely recognize the non-contractual liability of the EU institutions and the Member States for breach of the precautionary principle. To preserve their

⁷⁷ 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* (La Documentation française, 2011), 82.

⁷⁸ Alessandra Donati, 'Le principe de précaution: un outil de gestion des crises en droit de l'Union européenne' (2020) 10 *JTDE*, *op. cit.*

⁷⁹ Alessandra Donati, 'Vers un renforcement du contrôle juridictionnel à la Cour de justice de l'Union européenne ? L'exemple du contentieux du principe de précaution', (2020) 2/3 *Cahiers de droit européen*, 629-66.

⁸⁰ Dominique Ritteng, 'Le juge communautaire de la légalité et le pouvoir discrétionnaire des institutions communautaires' (1999) 9 *AJDA*, 645-57.

autonomy, the liability of decision-makers is conceived as an exceptional hypothesis reserved only for cases of manifest breach of the precautionary principle and direct damage.⁸¹

While litigation concerning the legality of the precautionary principle is very widespread in EU law and has given rise to a large body of case-law, litigation concerning the non-contractual liability of EU institutions and Member States is limited and is conceived as a residual remedy. For these reasons, the link between the knot *legality* and the knot *control of the precautionary measure* is strong, whereas the link between the knot *responsibility* and the knot *control of the precautionary measure* is weak in the precautionary principle's network.

4. Conclusion

By acknowledging the flexible and complex nature of the precautionary principle, which as a post-modern principle, escapes any attempt of systematization based on linearity and simplicity, the purpose of this paper was to give a polycentric interpretation of this principle. This interpretation is anchored in the construction of the network of the precautionary principle and makes it possible to *order the multiple* without reducing it to unity. In this regard, 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 its network. These knots are not isolated, but they are connected via some links to other knots that constitute the main concepts allowing identifying and applying the precautionary principle under EU law.

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 network built in this study could prove useful. In the first case, it 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 and the links that make up the network, 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 and links 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's network to the challenges posed by the progression of this principle.

⁸¹ For a few examples of non-contractual liability proceedings, see: GC 12 April 2013, *Du Pont de Nemours (France) SAS and others/European Commission*, *prec.*; GC 16 September 2013, *Animal Trading Company and others/European Commission*, *prec.*; GC 17 March 2016, *Zoofachhandel züpke gmbh and others/European Commission*, T-817/14, EU:T:2016:157.

Annex A

The network of the precautionary principle

Table I (Anticipation and Action)

- Strong link between two knots
- Weak link between two knots
- Link to be built between two knots

Table II (Anticipation)

Table III (Action)