http://dx.doi.org/10.18623/rvd.v15i32.1252

THE LIMITS OF THE PRECAUTIONARY PRINCIPLE IN BRAZILIAN ENVIRONMENTAL JUDICIAL DECISIONS

Carina Costa de Oliveira

Professor of international and environmental law at the University of Brasília (UnB), Brasília, DF, Brazil. Postdoctoral fellowship from the University of Cambridge - Cambridge Center for Environment, Energy and Natural Resource Governance (CEENRG), with a fellowship from CAPES--Strategic Programs; and Law School - University of Adelaide, Australia, with FAP-DF scholarship. PhD in Law from the University of Paris II, Panthéon -Assas. Master in International Law at the University Center of Brasília - UNUCEUB, Brazil - DF, Brazil.
Email: carinaoliveira@unb.br

Fabrício Ramos Ferreira

Professor at the IESB University Center (IESB), Brasília-DF, Brazil. Doctorate in Law from the University of Brasília (UnB), Brasília-DF, Brazil. Master in Sustainable Development by the Sustainable Development Center of the University of Brasília (CDS / UnB), Brasília-DF, Brazil. Specialist in Environmental Law and Sustainable Development by the Sustainable Development Center of the University of Brasília (CDS / UnB), Brasília-DF, Brazil. Graduated in Law from the University of Amazonia (UNAMA), Belém-PA, Brazil.
Email: ferreira. fabricio@uol.com.br

Gabriela Garcia Batista Lima Moraes

Professor at the Faculty of Law of the University of Brasília (UnB). PhD in Law from the University of Aix-Marseille-France and the University Center of Brasília (Uniceub), Brasília - DF, Brazil. Master in Law from the University Center of Brasília (Uniceub), Brasília - DF, Brazil. Specialist in International Environmental Law from UNITAR - UNEP, Switzerland. Bachelor of Laws from the University Center of Brasília (Uniceub), Brasília - DF, Brazil.
Email: gabrielalima@unb.br

Igor da Silva Barbosa

Diplomat at the Brazilian Ministry of Foreign Affairs, Brasília - DF, Brazil. Graduated in Law from the Federal University of Bahia (UFBA), Salvador - BA, Brazil. Graduated in Diplomacy from the Rio Branco Institute, Brasília-DF, Brazil.
Email: igorbarbosa1804@gmail.com

ABSTRACT

The object of the work is the analysis of the limits of the material and procedural effects of the precautionary principle, analyzing it directly into the brazilian court decisions. For this purpose, were collected the judgments available in the databases of several Brazillian Courts, wich showed a positive response to the term “precautionary principle”. Were analyzed a total of 182 judgments, whitch were organized by big themes. So, it was possibile to analyse the influence or the principle in administrative

decisions that grant polluting permits, on the reason for the shift of burden of proof, reaching the conclusion that it is implemented inappropriately by the courts. The reason is in the inaccurate conceptual bases, as well in the absence of a criteria for the aplication of the principle in a concrete case. In the end, have been synthesized the criteria that could be applied by the administrative authorities and by the judges in the intepretation of the principle.

Keywords: precautionary principle; effects; limits; criteria; environmental judicial decisions.

OS LIMITES DO PRINCÍPIO DA PRECAUÇÃO NAS DECISÕES JUDICIAIS BRASILEIRAS EM MATÉRIA AMBIENTAL

RESUMO

O objeto do trabalho é a análise dos limites dos efeitos materiais e processuais do princípio da precaução, analisando-o diretamente nas decisões judiciais brasileiras. Desta forma, foram coletados os acórdãos disponíveis dos bancos de dados informatizados de vários Tribunais brasileiros, que em seu sistema, apresentaram uma resposta positiva ao termo"princípio da precaução". Chegou-se a um número final de 182 acórdãos, que foram organizados por grandes temas. Foi então possível analisar a influência do princípio nas autorizações administrativas das decisões potencialmente poluidoras, na justificativa para a inversão do ônus da prova, chegando-se a conclusão final de que o mesmo é implementado de forma inapropriada nas decisões judiciais. O motivo é devido às suas bases conceituais imprecisas, bem como dada a ausência de critérios para a aplicação do princípio em um caso concreto. Ao final, foram sintetizados os critérios que poderiam ser aplicados pelas autoridades administrativas e pelos juízes na interpretação do princípio

Palavras chave: *princípio da precaução; efeitos; limites; critérios; decisões judiciais ambientais.*

INTRODUCTION

The precautionary principle has a clear impact on the prevention and remedying of environmental damage. There is a clear contribution to preventing environmental damage, for example, because public authorities may, as a matter of principle, prohibit or suspend potentially polluting activities. However, accurate and adequate interpretation of the principle by the courts is not yet recurrent because of still imprecise conceptual bases, which is due to the lack of criteria for their use or their management as a form of ideological imposition. In this sense, before demonstrating the limits interpretation of the principle, we will briefly present the normative and jurisprudential prediction in Brazil.

In Brazil, in the area of environmental law, the principle is evidenced in several infraconstitutional norms, specifically in the 2004 Coastal Zone Decree[1], the law laying down the rules for the management of genetically modified organisms of 2005[2], in the National Policy on Climate Change 2009[3] and the National Policy on Solid Waste 2010[4]. The principle is implicitly inserted in the Federal Constitution, in article 225, paragraph one, point V, in the following terms:

> *Art. 225. Everyone has the right to an ecologically balanced environment, a common good used by the people and essential to a healthy quality of life, imposing on the Government and the community the duty to defend and preserve it for present and future generations. Paragraph 1. In order to ensure the effectiveness of this right, it is incumbent upon the Government to: [...] V - control the production, commercialization and use of techniques, methods and substances that may endanger life, quality of life and the environment*[5].

Since the text refers to the obligation of the public authority to

1 Article 5, X, of the Brazilian Federal Decree No. 5,300 of December 7, 2004, which regulates Law No. 7,661, of May 14, 1988, establishing the National Coastal Management Plan.

2 Article 1 of Federal Law No. 11,105 of March 24, 2005, which establishes safety and control standards for activities related to genetically modified organisms.

3 Article 3 of Brazilian Federal Law No. 12,187 of December 29, 2009, the National Policy on Climate Change.

4 Article 6, I, of Brazilian Federal Law No. 12,305 of 2. 08. 2010, the National Policy on Solid Waste.

5 Federal Constitution of 1988.

act whenever there is a risk, it is possible to identify an implicit application of the precautionary principle. Even if this provision is not explicit, infra-constitutional rules contribute to its implementation. The most diverse Brazilian Courts have demonstrated, through their jurisprudence since the year 2000, on the application of the principle, for example, in cases of genetically modified soybeans[6], bioinsecticide plants[7], of electromagnetic fields[8], the construction of dams[9], shrimp farming[10], solid waste[11], agrochemicals[12], asbestos[13] and oil spills[14]. In 2016, the precautionary principle was expressly recognized as a constitutional principle in RE 627.189/SP[15]. The Judgment[16] established the precautionary principle as a constitutional principle attached to Article 225, paragraph 1 [a.,] Sections IV and V. The decision states that this consecration had been initiated in the Court since 2008[17], that is, there is a consolidation based on precedents that initiated the debate on the constitutional character of the principle.

An obvious effect of the principle is found in decisions related to civil liability for environmental damage (HAUTEREAU-BOUTONNET, 2005). It is possible to see the influence of the principle, for example, on the flexibility of the causal link[18] by the effect of reversing the burden of proof[19]. With regard to the element of "fault" in the field of environmental

6 TRF 1st Region, *Civil Appeal* nº 2000. 01. 00. 014661-1 / DF, decision of August 8, 2000.

7 TRF 1st Region, *Civil Appeal* nº 2001. 34. 00. 010329-1 / DF, decision of February 12, 2004; STJ, *regimental aggravation in the Measure of Protection. n.* 14. 446 / RS, decision of October 21, 2008.

8 STF, *Extraordinary Appeal* no. 627189 / SP, Rapporteur Minister Dias Toffoli. Decision June 8, 2016; STF, *General Repercussion in Extraordinary Appeal.* 627,189 / 2011, decision of September 22, 2011; STJ, *Regime in Provisional Measure* n. 17. 449 / RJ, decision of September 22, 2011.

9 STJ, *Special Appeal* n. 1330027 / SP, decision of June 11, 2012.

10 TRF 1st Region, *Civil Appeal* no. 0006530-49. 2001. 4. 01. 4000 / PI, decision of December 16, 2013.

11 STF, *Arrangement of Non-Compliance with Fundamental Precept* No. 101 / DF, decision of June 24, 2009.

12 TRF 1st Region, Violation *of instrument* No. 0007065-66. 2009. 4. 01. 0000 / DF, decision of December 16, 2013.

13 STF, Cautelar Measure in the Argument of breach of Fundamental Precept nº 234 / DF, decision of September 28, 2011.

14 TRF 2 [the] Region, *Appellate Offense* n. 0004075-70. 2012. 4. 02. 0000, decision of July 31, 2012.

15 STF, *Extraordinary Appeal* no. 627189 / SP, Rapporteur Minister Dias Toffoli. Decision June 8, 2016.

16 Pages 20, 21 of the Judgment of Extraordinary Appeal no. 627189 / SP, 2016.

17 STF, ADI n. 3510 of 2008; STF, ADPF n. 101 / DF, and STF ACO n. 876 MC- AgR.

18 STJ, *Special feature* no. 769. 753 / SC, decision of September 08, 2009.

19 STJ, *Special Feature* no. 1. 330. 027 / SP, decision of June 11, 2012; TRF 2 [the] Region, *Appellate Offense* n. 0004075-70. 2012. 4. 02. 0000, decision of July 31, 2012; STJ, *Special Feature* no. 883,656 / RS, decision of March 9, 2010; STJ, *Special Feature* no. 972902 / RS (2007 / 0175882-0), decision of

law, it is not necessary to demonstrate it, since liability is objective. For this reason, there is no influence of principle in the interpretation of guilt. In relation to the damage (or potentiality of damage) and the causal link, both must be demonstrated in the case of environmental damages (LEITE; AYALA, 2014).

The precautionary principle provides both preventive and remedial action in environmental law. In both cases, the principle guides the intervention of the public power in case of concrete evidence of serious and irreversible risks. Concerning prevention[20], the principle is based on measures which may include temporary restrictions, decommitments[21] and the commitment to continue technical or scientific research on the subject. The reparatory role of the principle can also be observed in the hypotheses where the reversal of the burden of proof is determined. These two effects, namely the orientation of public authority and the possibility of reversal of the burden of proof, can be classified as procedural effects and generally regarded as the fundamental contributions of the precautionary principle arising from interpretations of national courts. This finding is based on a careful and cautious analysis of the national decisions of the superior courts, as well as a comparative and international analysis of the subject, an analysis that demonstrated the importance of the judge in delimiting and operationalizing the precautionary principle.

However, the implementation of the principle has limits related to the imprecise conceptual bases used by the Brazilian courts. Sometimes the principle is seen as a rule that can, without any objective criterion, be applied[22]. There is no interpretation in the sense of ensuring the balance between present interests. This can be seen because the decisions do not indicate which criteria were used for the application or not of the principle

25 August 2009; STJ, *Special Feature* no. 1,237,893 / SP, decision of September 24, 2013.

20 STJ, *Special Feature* no. 592,682 / RS, decision of December 6, 2005; STJ, *Special Feature* no. 1,172,553 / PR, decision of May 27, 2014.

21 TRF 1st Region, *Civil Appeal* n. 2001. 34. 00. 010329-1 / DF, decision of February 12, 2004.

22 STJ, *Regimental Appeal in Suspension of Appeal and Judgment* 1279 / PR, decision of March 16, 2011; STJ, *Regime in the Special Appeal Law no.* 431420 / MG, decision of February 6, 2014; STJ, *Special Feature* no. 1,115,555 / MG, decision of February 15, 2011; TRF 1 the Region, *Civil Appeal* n. 0000663-24. 2009. 4. 01. 3603 / MT, decision of February 15, 2016; TRF 1 the Region, *Civil Appeal* n. 0003234-29. 2009. 4. 01. 4100 / RO, decision of January 25, 2016, among others. More than 80 judgments were identified that invoked the principle in the text or in the writing of the vote, without using any objective criterion for its application.

in the concrete case[23] (NOVILLE, 2006). The importance of analyzing the interpretation of the precautionary principle by the Brazilian courts (1), however, is limited by the inaccuracies associated with the unclear conceptual bases of the principle (2).

1 THE INTERPRETATION OF THE PRECAUTIONARY PRINCIPLE BY THE BRAZILIAN COURTS

So that an analysis of the interpretation of the precautionary principle could be made[24], the judgments available in the computerized databases of several Brazilian Courts[25] which in their case-law systems presented a positive response[26] to the term "precautionary principle"[27] were collected. The choice of sample space, which is characterized by judgments primarily from federal courts, was due to the need to delimit the field of research, by its computerized system of jurisprudence[28] and the comprehensiveness of environmental issues.

The analysis of the Superior Court judgments was due to the special purpose of the special appeal"to maintain the uniformity of the federal law, that is, to ensure that it is interpreted in the same way in any State of the Federation or by any organ of the Judiciary Power."(NEGRÃO, 1997, p. 05), as well as an extraordinary appeal aimed at correcting an eventual"direct and frontal offense against the Federal Constitution and general repercussions of constitutional issues."(MORAES, 2014, p. 604).

Initially, considering all the research universe, more than 450 judgments were identified that responded positively to the defined

23 In order to have an appropriate level of protection for the environment, some criteria could be used: probability of occurrence of the damage, tolerability of damage, range of harmful damage consequences, decision based on expertise, analysis of alternatives or technologies available, adequacy to the technical norms, proportionality between the advantages and disadvantages of the activity.

24 Some jurisprudential analyzes of the application of the precautionary principle have already been made, without, however, conducting a more thorough examination of the judgments, analyzing them quantitatively and qualitatively (ANTUNES, 2007; CZYZESKI, 2010).

25 Federal Regional Courts 1 ª, 2 ª, 3 ª, 4 ª, and 5 ª Regions (TRF 1 ª Region, TRF 2 ª Region, TRF 3 ª Region, TRF 4 ª Region, TRF 5 ª Region), Superior Court of Justice (STJ) and Supreme Federal Court (STF).

26 A positive response was the identification of the judgment containing, either in its opinion and / or in its vote, the express reference to the term"precautionary principle".

27 The summary of the compiled data can be found in the Annex.

28 The absence of a computerized system in some state courts, the inaccuracy of these or difficulty in reading the reports and votes, meant that, generally, these courts were excluded from the selected sample space.

criterion. From this total were eliminated the judges who had no link with Environmental Law[29] , reaching a final number of 182 (one hundred and eighty-two) judgments[30], which were organized by major themes[31] , such as: fauna and flora, mining, conservation units, among others. The judgments were also separated according to a criterion of "correct application"[32] of the precautionary principle. The data were tabulated in an Excel worksheet, in order to make possible the interrelationship between them.

The survey attempted to cover as many judgments as possible, thus comprising a time window from 2007 to 2016. In this way, it was possible to conclude that the Brazilian courts interpret the precautionary principle in a preventive and remedial manner, since 43% of the judgments were identified as not having correctly applied the precautionary principle, that is, or invoked it ideologically, to justify a personal position of the judge, or did not make an analysis of the facts to justify their use, pointing out the existence of scientific uncertainty or other objective criteria.

One fact that caught the attention of the researchers was that 57% of the judgments were classified as not having correctly applied the precautionary principle[33]. Within this universe, 41% of them were judged without an analysis of merit[34]. In other words, it is possible to say that a case-law of procedural bases is being constructed that is not solid, because they are judged to be supported only by the concomitant identification of the precautionary elements and not by a deeper and more detailed analysis.

29 For example: TRF 1st Region, Civil Appeal n. 0006321-57. 2003. 4. 01. 3500 / GO, decision of February 26, 2016; TRF 1st Region, Appeal on writ of mandamus n. 0043939-06. 2007. 4. 01. 3400 / DF, decision of November 24, 2015.

30 06 judgments come from the Supreme Court or the equivalent of 3% of the total number of judgments selected; 45 of the STJ, or 25%; 117 of TRF 1 the Region, or 65%; 05 of TRF 2 the Region, or 3%; 07 of TRF 3 the Region, or 4%; 01 of the Federal Court of the 4th Region, and; 01 of the Federal Court of the 5th Region, totaling the sum of both approximately 1%.

31 The separation of the judgments into themes and sub-themes was the chosen form for the grouping of similar subjects.

32 In order to classify the judgments under this criterion, the researcher responsible for analyzing the wording of the vote and the text idealized whether the argument represented the application of the principle of prevention and / or whether there was a question of scientific uncertainty justifying the application precautionary principle. They were classified as incorrect application of the precautionary principle, the decisions that merely quoted it in the wording of the vote or in the documents transcribed in it, as well as those that even quoting it, did not take it into account for the conclusion of the vote. The criteria used by the rapporteur for invoking the application of the principle (correctly or otherwise) were also identified.

33 104 judgments were thus classified.

34 43 judgments.

It should be noted, therefore, that administrative bodies should take into account the precautionary principle in the application of measures to mitigate administrative infractions and criminal sanctions, as foreseen, for example, in article 54, third paragraph of Law 9605/1998, on administrative infractions and environmental crimes. Certain and uncertain risks are assessed by these means, sometimes resulting in the adoption of provisional risk assessment measures. In the reparatory sphere, one of the most relevant effects observed in the decisions is the possibility of reversing the burden of proof due to the direct application of the principle. The principle is effective both by means of measures to be taken in the context of administrative authorizations for potentially polluting activities (1) and by the possibility of reversing the burden of proof to repair damages (2).

1.1 THE INFLUENCE OF THE PRINCIPLE ON ADMINISTRATIVE AUTHORIZATIONS OF POTENTIALLY POLLUTING ACTIVITIES

The precautionary principle can be interpreted in the context of the administrative authorizations of the potentially polluting activities questioned before the Judiciary Power. The way in which the principle is interpreted can be verified in the questions related to the requirement of prior information in case of potential environmental damage, for example in the requirement of an environmental impact study and in the annulment of administrative authorizations granted without the requirement of necessary conditions for the proper prevention of damage. Before analyzing the impact of the principle on administrative measures it is important to indicate the relationship between the administrative and the judicial scope in applying the precautionary principle.

A first example of the implementation of the principle for the damage prevention hypothesis can be found in situations that require - as an obligation to do - environmental impact studies. The most characteristic example is a judgment related to the subject of genetically modified organisms (GMOs)[35] . A lawsuit was filed as a precaution by the Consumer Protection Agency in the Federal Court of the 1st Region. {/1The judge of first instance decided, in interpreting the application of the precautionary

35 TRF 1 the Region, 2000. 01. 00. 014661-1 / DF, decision of August 8, 2000. In the opposite direction: STJ, Resp nº 592. 682 / RS, decision of December 6, 2005.

principle, that the study should be carried out to demonstrate the possible impacts of the activity on health and the environment, even if there is no scientific certainty on the subject. On the other hand, on appeal, the Federal Court of the 1st Region did not apply the principle, as the Panel judges understood that both studies and specific rules had already been conducted on the issue of food security, trade and labeling[36] . This case had an interesting effect on the more specific normative production on the subject, which occurred after the decision of the first instance.

In another situation, a writ of mandamus was filed[37] against the act that did not release the plantation and trade of soybeans. The competent administrative body had not authorized the mentioned activities because it did not have precise information on the possible health and environmental consequences of the product under review. The judgment of the court upheld the administrative decision that the studies on the color of soybean yarn were still inconclusive as to their effects and that safety would therefore be denied. According to the judgment, from all that appears in the records, there is no alleged omission by the authority appointed as co-founder to justify the granting of the order. This is because the question regarding the analysis of seeds and cultivars requires studies, research and laboratory tests in order to create a regulatory rule on the release of soybean planting and marketing by the responsible organs of public administration.

It is interesting to note that in cases where scientific knowledge was considered by the court as more detailed, as in the case of modified maize, the precautionary principle was not applied and the activity could be carried out[38] .

The cancellation of administrative authorizations granted by institutions without due compliance with all procedures provided for by law is also an example of the effects of the implementation of the precautionary principle. An emblematic case on the subject was from experiments with bio-insecticidal plants presented by the Federal Public Ministry through a public civil action against the Union. Illegals were identified in the culture of GMOs that functioned as biological agents of pest control. For this situation, it was not required to register the activity (Special Temporary

36 For example, Decree No. 8. 971 / 2001 and Decree No. 4680/2003.

37 STJ, MS n. 16,074 / DF, decision of August 31, 2012.

38 TRF 4th Region, Civil Appeal n. 5020884 11. 2013. 404. 7000 / PR, decision of July 17, 2015.

Register - RET) of biotechnology companies[39] by the competent organization. As plants generated uncertain risks for a wide variety of insects, which were not necessarily harmful to plants, the precautionary principle was invoked to require further studies to learn more about the effects of the plant on the environment and health. The judges, both of first and second instance, decided in favor of adopting precautionary measures and suspended authorizations.

The principle was also interpreted in the same sense, that is, about the need to carry out studies, in the context of the judges who decided on the construction of dams[40] . A judgment pointed out that even where there are no rules on the requirement for impact assessments, it would be mandatory to submit the precautionary principle in order to apply the precautionary principle[41] .

Litigation relating to the emission of electromagnetic waves and the installation of antennas for the connections of mobile telephones can be cited in the same direction. There are first and second instance decisions based on the precautionary principle. Measures such as the interruption of the construction of transmission lines due to the risks to health and the environment were adopted, as well as decisions that allowed constructions[42] . All these actions were brought together in a single case in the Federal Supreme Court for a single decision[43] , which was taken in 2016. The main question was to determine the amount of electromagnetic waves before which the population could be submitted and if that amount could exceed the parameter established by the National Electric Energy Agency-ANEEL[44] . In 2015, STJ, in analyzing RE No. 627189 / SP, confirmed the decision of the second instance that in some cases studies could be made and standards adopted higher than those established by ANEEL[45] . However, in July 2016, the STF reformed several decisions favorable to

39 TRF 1st Region, Civil Appeal n. 2001. 34. 00. 010329-1 / DF, decision of February 12, 2004.

40 TRF 1st Region, Civil Appeal n. 0005591-31. 2007. 4. 01. 0000 / RR, decision of 27 April 2009; TRF 1st Region, Civil Appeal n. 0002955-06. 2001. 4. 01. 4300 / TO, decision of 12 July 2007; TRF 1st Region, Embargoes of declaration in the Civil Appeal n. 0000709-88. 2006. 4. 01. 3903 / PA, decision of 27 August 2012;

41 STJ, Resp n. 1. 172. 553 / PR, decision of May 27, 2014.

42 STJ, AgRg in Precautionary Measure No. 17. 449 / RJ, decision of September 22, 2011.

43 STF, General Repercussion in Rec. Extraord. n. 627,189 / SP, decision of September 22, 2011; STJ, AgRg in Precautionary Measure n. 17,449 / RJ, decision of September 22, 2011.

44 Second Law n. 11,934 / 2009 and, mainly, Normative Resolution n. 398/2010.

45 STJ, Special Appeal nº 1,437,979 / EC, decision on November 10, 2015.

the suspension of activities connected to the emission of electromagnetic waves in the sense that the limits adopted by ANEEL were sufficient and therefore, no other specific studies would be necessary on the standards to be adopted About the subject. The impact of the principle is observed in the interpretation of the applicable administrative measures, since there has been constant questioning of the administrative authorizations granted and suspended for the construction of transmission lines, which results in a clear lack of legal certainty for the activity[46] .

This reasoning can also be seen in the case of the exploitation of resources located on the continental shelf[47] . In a public civil action filed by the Federal Public Prosecutor's Office in detriment of Chevron do Brasil and Transocean Brasil, the judicial decision was in favor of the interruption of the oil exploration activity until: a) the companies established procedures related to the implementation of a Plan for abandoning the well, providing for a fine of five hundred million reais in case of failure to comply with the decision; b) more in-depth studies on the subject were made. Complementary studies have also been required in cases related to the construction of dams[48].

In the opposite direction - in which there is no annulment or suspension of administrative authorizations granted - there is a decision of the Superior Court of Justice[49] who stated that it was not reasonable and proportional to interrupt the construction of a dam. In this case, concerning the construction of a Dam on the Tibagi / PR (UHE Mauá, Municipality of Telêmaco Borba), the Court *of* First Instance had suspended the authorization due to uncertain risks that the activity could cause to the environment. The decision of the STJ on this suspension prevailed the understanding that the activity could not be suspended because authorizations had been granted based on specific requirements that were being fulfilled by the company. According to the court, the suspension of construction would have, on the one hand, economic, administrative and social effects and, on the other hand, the protection of the environment would have been subject to control. In the same sense, it was the decision of the STF in the case of electromagnetic fields in which the principle of proportionality was used

46 On the subject of electromagnetic fields see the specific judgments on the subject.

47 TRF 2 the Region, Appellate Offense n. 0004075-70. 2012. 4. 02. 0000, decision of July 31, 2012.

48 STJ, 1863 / PR, decision of February 18, 2009.

49 STJ, 1863 / PR, decision of February 18, 2009.

to justify the decision that the construction of transmission lines should not occur if the standards established by ANEEL had been complied with.

In summary, it is noted that administrative decommitments or suspensions have already taken place on the basis of the interpretation of the precautionary principle. However, there is no clarity as to the criteria used in making such decisions, which will be discussed at a later date in that article. In addition to this effect, the possibility of reversal of the burden of proof can also be cited as an impact of the interpretation of the principle.

1.2 THE INFLUENCE OF THE PRINCIPLE ON THE REVERSAL OF THE BURDEN OF PROOF

In the context of civil liability law, the precautionary principle has influenced the flexibility of the causal link[50] , for example, by reversing the burden of proof of damage[51] (MACHADO, 2015, pp. 117-118, MILARÉ, 2001, pp. 1499-1515). The cases of dam construction[52] and on oil exploration[53] may be mentioned as examples. The limits of this finding are again related to the lack of criteria that can guarantee this effect of the interpretation of the precautionary principle. It is important to present the normative conditions related to the reversal of the burden of proof in Brazil before demonstrating the effect of the precautionary principle in environmental cases.

The main arguments that justify the reversal of the burden of proof are provided for in the Public Civil Action Law, Article 21 (Law 7,347 / 1985) and the Consumer Code, Article 6, VIII[54] . It deals with exceptions to the general rule contained in the Code of Civil Procedure, Article 373, which provides that the author must bear the burden of proof of his right. The criteria according to which the inversion is possible, in the case of civil proceedings are: the normative forecast on this possibility and the condition of vulnerability of the applicant (insufficiency). After

50 STJ, Resp n. 769. 753 / SC, decision of September 9, 2009.

51 STJ, Resp n. 1330027 / SP, 3rd. class, decision of June 11, 2012; TRF 2, Infringement of instrument n. 0004075-70. 2012. 4. 02. 0000, 5th. class, decision of July 31, 2012.

52 STJ, Resp 1330027 / SP, 3rd. class, decision of June 11, 2012.

53 STJ, Resp 883656 / RS, decision of March 9, 2010.

54 There are authors who believe that there is no mechanism to reverse the burden of proof in environmental law. The device would exist only in consumer law. On the subject see: (MILARÉ, 2001, p. 1499).

the publication of Law no. 13. 105 / 2015, or the New Code of Civil Procedure, the reversal of the burden of proof was also made possible by the peculiarities of the case, related to the impossibility or excessive difficulty of fulfilling the burden. In this way, the magistrate has the power to distribute, dynamically, the burden of proof, provided that it does so by means of a reasoned decision. These criteria are fulfilled in some cases, for example in the confrontation between fishermen and companies responsible for the construction of dams. With regard to the second criterion, there is an interpretation that begins to be a majority, but it must be analyzed more precisely by the judges.

In a case about the construction of a dam[55] , the second criterion was interpreted as being fulfilled in the context of effects on both the aquatic fauna of the Paraná river and the activities of the fishermen of the region. The fishermen postulated the obtaining of compensation due to the economic damages suffered, related to the construction of the dam. In the first and second instance decisions, the case was terminated because of the lack of scientific evidence on the causal link between dam construction and impacts on aquatic fauna. However, the STJ, based on its own precedents[56] accepted that it was possible to process the demand so that the liability of the company could be established, and it was for the company to demonstrate that the construction of the dam would not have an impact on aquatic fauna and, consequently, on fishing. The STJ allowed the reversal of the burden of proof for the company to prove whether or not there was damage. The precautionary principle was one of the sources used to justify the reversal of the burden of proof in a way complementary to the arguments related to the case (normative forecast of the possibility and condition of the applicant's hypothesis). Without examining here whether it is the application of the principle of prevention or precaution, it is possible to verify that the principle impacted in the analysis of the subject and generating effects in the classic procedural criteria.

However, there were other decisions that interpreted the element of hyposufficiency in a way different from that of classical procedural law. In a STJ judgment[57], the application of the precautionary principle

55 STJ Resp nº 1. 330. 027 / SP, decision of June 11, 2012.

56 STJ, Resp nº 1,049,822 / RS, decision of April 23, 2009.

57 STJ, Ans. No. 972. 902 / RS, decision of August 25, 2009.

generated an effect of reversing the burden of proof in a lawsuit in which the plaintiff was the Public Prosecutor's Office and the defendant a private company. The defendant argued that the Public Prosecutor's Office did not comply with the condition of hyposufficiency in order for the reversal of the burden of proof to be applied. The STJ stated that the reversal of the burden of proof could occur because the company, when conducting potentially dangerous activities, must demonstrate that its services are safe and "that the public and collective character of the object of legal protection justifies the reversal of the burden of proof". Considering the Public Prosecutor's Office as the representative of society, the reversal of the burden of proof was founded on behalf of society and the object of protection. The precautionary principle has been interpreted in conjunction with other principles, such as the principle"*in dubio pro natura*"and the principle of good faith (BRYNER, 2015, pp. 245-258), in the sense that it is the company's burden to demonstrate that its activity integrates environmental protection.

It is possible to interpret, in the light of the above cases, that, in the context of environmental damage, the reversal of the burden of proof is justified by substantial and procedural arguments. The finding by the judge of the existence of a good or object of a collective nature, such as the environment, authorizes him to decide in favor of reversing the burden of proof. The most expensive part, in this context, is the company, represented by the Public Prosecution Service.

In the light of what has been analyzed, there is an opening for the interpretation of the principle in order to guarantee the prevention and reparation of environmental damages. However, there is still legal uncertainty arising from conceptual imprecision and the lack of objective criteria for the use of the principle in environmental demands.

2 THE INAPPROPRIATE IMPLEMENTATION OF THE PRINCIPLE DUE TO IMPRECISE CONCEPTUAL BASES

The precautionary principle is often not precisely conceptualized and applied in Brazilian jurisprudence[58]. The use of the principle was

58 As stated above, 57% of the judgments examined did not apply the precautionary principle on the basis of technical criteria or the existence of scientific uncertainty.

perceived as a"joker"that is launched in the face of complex situations that would require a greater caution in the legal analysis of the facts and the grounds, by the judges. One way of ensuring legal certainty in using the principle, as the legal basis for judicial decisions, would be to establish objective criteria which, once identified, would justify its application.

The lack of criteria, in most of the judicial texts analyzed in the research, increases legal uncertainty for activities that exploit natural resources. International law is an interesting parameter as regards the caution and care that international jurisdictions have in interpreting the principle that, at the national level, still lacks a solid conceptual basis.

The precautionary principle is developed along the typical path of environmental standards: first, the principle was enshrined in non-binding political statements; in a second moment, the principle began to form part of preambles of treaties[59]; and finally, the standard was fixed in operational devices[60] (DAILLIER et al, 2009, p 1453;.. HAUTEREAU-BOUTONNET et al, 2015;. KISS; BEURIER, 2010, p 156-158;. MALJEAN-DUBOIS, 2008, p 75-82; PRIEUR, 2014, p. 58-72; SANDS et al., 2012, p. 217-228), of specific environmental treatises (ELLIS, 2006, p 445). Despite this development and the adoption of the precautionary principle in various national, regional and international legal orders, its use is still controversial[61] (BIRNIE; BOYLE; REDGWELL, 2009, p. 155) The main argument for refusing an independent normativity to the precautionary principle is that of its vague definition, in view of the multiplication of interpretations and purposes connected to it[62].

The situation of the interpretation of the principle in Brazil is

59 Preamble to the Convention on Biological Diversity (CBD), for example.

60 The principle was formalized at the outset by the 1990 Bergen Declaration. After this first appearance the principle was formulated in successive conventions, for example the Bamako Convention of 1991 on the prohibition of import of hazardous waste in Africa (Article 4, §3); the Rio Declaration of 1992 (principle 15); the 1992 Framework Convention on Climate Change (Article 3, §3); the Convention on Biological Diversity (preamble); the 1994 Sofia Convention on the Protection of the Danube (Article 2 § 4).

61 As an example of the hesitation of the case-law on the precautionary principle, see ICJ, decision of 25 September 1997, Gabickovo-Nagymaros Project, p. 68, §114, and also ORD, special group, report of 29 September 2006, EC - Approbation et commercialisation des produits biotechnologiques, § 7. 88-7. 89.

62 The plurality of the objectives of the precautionary principle is evident from the analysis of the variety of matter in the conventions which enshrine it: the precautionary principle may be general, such as the Bergen or Rio Declaration, or specific, as in the cases of the Bamako Convention (hazardous waste), the UNFCCC (climate change), the Sofia Convention (protection of the Danube), the Cartagena Protocol (GMOs).

not different. However, contrary to international environmental law, there are no doubts about the existence of obligations linked to the precautionary principle. Due to the implicit prediction in the text of the Federal Constitution, specifically in article 225, paragraph one, V, and also of the forecast expressed in several national provisions[63], Brazilian judges use the precautionary principle as a rule of law, many faeces as the main source of argumentation - a kind of authority argument[64] - in the face of a large number of environmental legal problems, to a certain extent, to the detriment of legal certainty. Thus, the principle is sometimes understood as a rule that must be applied, unrelated to criteria and the legality normally required for the application of a principle.

Thus, it is important to analyze the absence of a defined legal regime for the principle (1), as well as the lack in the Brazilian legal system of objective criteria that justify the application of the principle.

2.1 THE INDEFINITE LEGAL REGIME OF THE PRINCIPLE IN BRAZIL

The precautionary principle does not have a legal regime defined in Brazil (MILARÉ, 2001). This finding can be made, mainly, from the ignorance of the judges, about the logic that contributed to the realization of the principle in international environmental law, ignorance that led to a confusion between the principle of precaution in the condition of principle and in the condition of rule legal basis. There is also a confusion between the content of the precautionary principle and the content of the principle of prevention[65]. In addition, there are occasions when the principle is applied as a reason for deciding, without due analysis as to the conformity of its

63 Art. 1 and Art. 5, X, Federal Decree No. 5,300 of December 7, 2004, which regulates Law No. 7. 661, of May 16, 1988, establishing the National Coastal Management Plan; Art. 1 of Federal Law 11. 105 of March 24, 2005, which establishes the safety and control standards for activities related to GMOs; Art. 3 of Federal Law No. 12,187 of December 29, 2009, which creates the National Climate Change Policy and Article 6, I, of Federal Law No. 12,305, of August 2, 2010, the National Solid Waste Policy.

64 In 89 judgments (out of a total of 182 analyzed), despite the existence of a reference to the precautionary principle (in the vote or in its agenda), it was not analyzed or merely quoted in its wording, without having influenced directly in its conclusion, that is, there was no subsumption of the facts the legal basis of the principle. This number of judges represents approximately 49% of all judgments surveyed.

65 There are authors who confirm that the precautionary principle should be analyzed in the same way as the precautionary principle.

application[66]. These are circumstances that result in the trivialization of the principle[67], that is, in the distance, in practice, from the principle of being of principle.

The precautionary principle is conceptually a general feature of preventing an environmental impact, but this principle differs from prevention by reason of the risk it must regulate. The application of the principle of prevention is done when the dangers resulting from an economic activity are known, even if a minimum uncertainty about the occurrence, severity, or extent of the damage exists (MACHADO, 2015, p. 99; PRIEUR, 2014, p. 60; SANDS et al., 2012, p. 218). There is a certainty that exposure to danger will lead to damage and the right to repair. In turn, the precautionary principle should be used when there is a risk that the exact impact of the activity on the environment or health is unknown. The principle has the function of limiting the risk of regulating it, since zero risk is impossible to avoid (NOIVILLE, 2006, p. 37). The scientific uncertainty about the consequences of each activity is the central element to differentiate the two principles (DAILLIER et al., 2009, p. 1453). For the precautionary principle to be used, the consequences of the risk must be supported by criteria such as the magnitude or seriousness of the risk[68] and irreversibility[69] (BIRNIE; BOYLE; REDGWELL, 2009, p. 153; HAUTEREAU-BOUTONNET et al., 2015, p. 110), which requires a complex and detailed analysis on the subsumption of the principle and the concrete case by the operator. This complexity is not yet part of the findings made by national court judgments which sometimes simplify and trivialize the application of the principle[70]. The *leading case* in the

66 For example, TRF 1st Region, Public Prosecution in Public Civil Action, n. 0031223-88. 2009. 4. 01. 0000 / BA, decision of February 08, 2013, and Remittance ex officio in writ of mandamus n. 0043161-04. 2010. 4. 01. 3700 / MA, decision of March 6, 2013.

67 See, for example, the following judgments: TRF 1st Region, Civil Appeal, n. 0000496-17. 2008. 4. 01. 3902 / PA, decision of 30 September 2015; TRF 1st Region, Civil Appeal, n. 0003450-21. 2008. 4. 01. 4101 / RO, decision of 18 February 2016; TRF 1st Region, Civil Appeal, n. 0004398-60. 2008. 4. 01. 4101 / RO, decision of 02 December 2016; TRF 1st Region, Civil Appeal, n. 0005186-84. 2011. 4. 01. 3902 / PA, decision of January 28, 2016;

68 STJ, Regime in the Suspension of injunction and sentence nº 1. 419 / DF, decision of January 08, 2013; STJ, Regime in the suspension of security n. 2,333 / EC, decision of 29 June 2010; TRF 1 the Region, Civil Appeal n. 0000066-05. 2007. 4. 01. 3804 / MG, decision of September 3, 2016; TRF 1 the Region, Civil Appeal n. 0000162-61. 2000. 4. 01. 3902 / PA, decision of 23 April 2007; TRF 1 the Region, Civil Appeal n. 0002955-06. 2001. 4. 01. 4300 / TO, decision of 14 November 2007; TRF 1 the Region, Civil Appeal n. 0005456-86. 2003. 4. 01. 4000 / PI, decision of May 3, 2008, among others.

69 Article 54, paragraph 3, of Law No. 9605/1998, the Environmental Crimes Act.

70 TRF 1 the Region, Appellate Offense n. 0018353-06. 2012. 4. 01. 0000 / MA, december 31, 2013 and TRF 1 the Region, Civil Appeal n. 0036559-29. 2006. 4. 01. 9199 / PI, decision of 10 September

delimitation of criteria is the Extraordinary Appeal[71] 627189, decided in 2016, regarding the possible impacts of electromagnetic fields on health and the environment. The criteria developed in this particular case will be subject to more detailed analysis in the second part of that article[72].

Some Brazilian judges, even in higher courts, apply the precautionary principle to situations that require the use of the principle of prevention. There are examples of this confusion, even in the framework of the FTS[73] and the STJ[74], both charged with harmonizing constitutional and infra-constitutional rules, respectively. A study[75] which examined the TRF judgments of the 1st Region, between the years 2013 and 2014, in which the principle was applied was carried out. It was found that out of a total of 57 (fifty-seven) judgments where the precautionary principle was mentioned, 57% (fifty-seven percent) of them did not use any criteria to justify their invocation, only 23 judged did an analysis the possibility of using the principle according to the specific criteria[76] connected to the severity or irreversibility of the damage[77].

Of the total number of judgments identified in the aforementioned study, 23 of them, or 43%, were delivered in preliminary injunctions/ injunctions, that is, in cases in which there was a superficial examination of the controversy. This finding, considering the construction of a jurisprudence without solid conceptual bases and formulated in situations in which there was no meritorious analysis, is an element that should be the subject of further studies by the academic community.

In this research, situations can be mentioned that invoked the principle as reason to decide, but without demonstrating the existence of a

2013.

71 STF, RE 627189, decision of June 8, 2016.

72 In addition, see the specific article on electromagnetic fields in this book.

73 STF, Regime in the Appellate Offense n. 781,547 / RS, decision of March 13, 2012;

74 STJ, Embargo de declaração no Resp n. 843. 978 / SP, decision of July 03, 2013.

75 FR FERREIRA. Research by Fabrício Ramos Ferreira in the Research Group on Natural Resources and Sustainability Law (GERN) of the Faculty of Law of the University of Brasília.

76 30% invoked the predictability of the damage; 9% removed the application of the precautionary principle; 2% referred to the magnitude and harmful consequences of the damage; 2% referred to the environmental tolerability of the expected impacts;

77 For example, TRF 1 the region, Civil Appeal n. 0002591-78. 2007. 4. 01. 3700 / MA, decision of November 19, 2014; TRF 1 region, in Appeal Injunction n. 0012724-23. 2009. 4. 01. 3600 / MT, decision of October 15, 2014; TRF 1 the region, Innominatory injunction n. 0070024-73. 2009. 4. 01. 0000 (1) / MT, decision of October 15, 2014.

scientific uncertainty, applying it as if it were preservation, such as to the operation of hydroelectric plants[78] or administrative infractions[79] as well as hypotheses where the principle has been expressly rejected[80], and it should be noted that, in the explanation of the vote, the use of clear criteria and the weighting of values and principles were used.

With regard to the STJ, the example of the judgment of case 1279 / PR[81]. The situation concerned concerned the installation of a landfill in an area of environmental protection near an aquifer. In this case, the hazards that can be committed by companies involved in this activity are known, a fact that leads to the need to adopt measures from the application of prevention. The fact that one does not know the exact size of the possible damage that will be caused by the activity does not justify the reference to the precautionary principle, a foundation used by the STJ to prohibit the completion of the construction in question. In other decisions, for example, the burning of sugarcane straw[82], an activity governed by Brazilian law due to its harmful effects on the environment - was subject to judicial regulation by the precautionary principle.

The STF situation is also serious because of the importance of the decisions taken by the Court. There have already been cases in which the Court upheld a decision by a court of second instance applying the precautionary principle in a case of confrontation between neighbors on the conformity of the level of noise produced by air conditioning under national law[83]. The lack of manifestation of the national congress, regarding the fact that works reached indigenous lands, was also object of invocation of the principle, although in a vote invoked by the divergence, that was

78 TRF 1 the Region, Civil Appeal n. 0000968-19. 2011. 4. 01. 3900 / PA, decision of January 14, 2014; TRF 1 the Region Regime in civil appeal n. 0000968-19. 2011. 4. 01. 3900 / PA, decision of January 14, 2014; TRF 1 the Region, Civil Appeal n. 0025999-75. 2010. 4. 01. 3900 / PA, decision of 22 April 2014.

79 TRF 1 the Region, Civil Appeal n. 0000914-26. 2006. 4. 01. 3901 / PA, decision of February 21, 2014; TRF 1 the Region, Civil Appeal n. 0043161-04. 2010. 4. 01. 3700 / MA, decision of March 13, 2013;

80 TRF 1 the Region, Civil Appeal n. 0000165-29. 2008. 4. 01. 4001 / PI, decision of March 1, 2013; TRF 1 the Region, Civil Appeal n. 0001317-69. 2009. 4. 01. 4101 / RO, decision of 13 February 2013; TRF 1 the Region, Civil Appeal n. 0001659-80. 2009. 4. 01. 4101 / RO, decision of 13 February 2013; TRF 1 the Region, Civil Appeal n. 0003468-42. 2008. 4. 01. 4101 / RO, decision of 1 March 2013; TRF 1 the Region, Appellate Offense n. 0073503-06. 2011. 4. 01. 0000 / RO, decision of 11 March 2013;

81 STJ, AgRg in the Suspension of Appeal and sentence, 1279 / PR, decision of March 16, 2011.

82 STJ, Special Appeal no. 965. 078 / SP, decision of 20 August 2009.

83 STF, Agravo Regimental, n. 781,547 / RS, decision of February 09, 2012.

defeated[84]. In another case[85], one of the ministers stated that it would be necessary to use the precautionary principle to justify the jurisdiction of the Brazilian Federal Court to try cases of illegal trade in wild animals. As the rapporteur stated:"according to this principle of international environmental law [precaution], people must establish mechanisms to prevent preventive action that threatens the sustainable use of ecosystems"[86].

Despite the criticisms presented above, it is recognized that the courts contributed to the implementation of the precautionary principle in Brazil. For example, in the case of the introduction of GMOs in the country, the courts played a central role in banning the planting and trade of GMOs without conducting more detailed studies of environmental effects (MACHADO, 2015, pp. 110-121). specifically using the environmental impact study as a tool to justify administrative authorizations[87].

The confusion surrounding the precautionary principle in Brazil, demonstrated in the previous paragraphs, is also the result of the absence of objective criteria to apply it. These criteria could be established by laws or jurisprudence, which initiated this process in some judgments.

2.2 THE ABSENCE OF OBJECTIVE CRITERIA FOR THE PREDICTABILITY OF THE USE OF THE PRINCIPLE

In Brazil, there are no standards establishing objective criteria to ensure legal certainty in the implementation of the precautionary principle[88]. In this context, it seems that the lack of objective criteria is one of the factors that contribute to a banal use[89], with no precise content

84 STF, Regime Injunction in the precautionary measure in the original civil action, n. 876 / BA, decision of 1 August 2008.

85 STF, Extraordinary Appeal n. 737. 977 / SP, decision of September 4, 2014.

86 STF, Extraordinary Appeal n. 737. 977 / SP, decision of September 4, 2014, p. 07.

87 Still on GMOs, the Brazilian judiciary will have the opportunity to judge a direct action of unconstitutionality that demands the annulment of the law governing the matter in Brazil, ADI 3526. One of the arguments proposed by the federal Parquet to invalidate some of the provisions of Law 11,105 is the observance of the precautionary principle.

88 The European Union, for example, has published a detailed list indicating the criteria to be followed by the Community authorities when applying the precautionary principle or not. The list is available at <http://eur-lex.europa.eu/legal-content/FR/TXT/?uri=URISERV:l32042>. Accessed July 2017.

89 57% of the judgments examined invoked the application of the precautionary principle without the use of specific criteria or did so without the existence of scientific uncertainty. Only in 30 judgments, that is, in approximately 16% of all the analyzed cases, there was a meritorious analysis of the discussion in situations that were considered as having correctly invoked the principle.

and no direction in Brazil. Faced with this gap, the need to synthesize the criteria that can be applied in a concrete case (i), as well as legal measures that may be an effect of its use (ii).

2.2.1 CRITERIA FOR APPLYING THE PRECAUTIONARY PRINCIPLE TO A SPECIFIC CASE

The interpretation of the precautionary principle could be more objective if the criteria linked to its application were used as a parameter. As indicated above, the *leading case* in the delimitation of criteria for the application of the principle in Brazil is the Extraordinary Appeal[90] 627189, decided in 2016, regarding the possible impacts of electromagnetic fields on health and the environment. Based on this concrete case and doctrinal contributions[91], mainly included in this book, the following criteria can be synthesized with respect to the possibility of applying the principle: a) scientific uncertainty; b) the severity of the risk; c) irreversibility of the damage; d) proportionality to the level of protection chosen; (e) the reasonableness of the measure

The precautionary principle can be applied as a legal source in cases where the risk is linked to scientific uncertainty. If the effects of the hazard are known by science, that is, if there is certainty about the impacts of the activity, the prevention principle should be applied (MACHADO, 2004). In addition, for the precautionary principle to be applied, it is also necessary that the risks of the activity be serious or irreversible, as provided for in the environmental crimes law (Law 9605/1998), article 54, paragraph 3. These criteria were also provided for in Article 15 of the Rio Declaration[92]. In view of the STF Judgment of 2016, it is argued that the standard adopted in Brazil for the application of the principle is soft, flexible, since it requires that the damage be serious and irreversible.

Two other relevant criteria, which will be more detailed in the analysis of the thematic areas, as in the case of electromagnetic fields, are

90 STF, RE 627189, decision of June 8, 2016.

91EUR-Lex. Precautionary principle. Available at: http://eur-lex.europa.eu/legal-content/PT/TXT/?uri=LEGISSUM:l32042. Accessed on: 25. 07. 2017.

92 Principle 15 of the Rio Declaration: "In order for the environment to be protected, preventive measures will be implemented by States according to their capabilities. Where there are threats of serious or irreversible risks, the lack of full scientific certainty will not be used as a reason for postponing cost-effective measures to avoid environmental degradation"

proportionality and reasonableness. It is known that both are constantly cited in jurisprudence, but there is still considerable uncertainty as to its operationalization[93]. It is understood that proportionality and reasonableness should be used to weigh the effects of the precautionary principle. However, more objective criteria should be established to assess whether a decision was proportionate or not, reasonable or not. The control of legality is one of the ways to evaluate proportionality, which was done by the STF Judgment of 2016 and in several others in the analysis of compliance with the rules of the Regulatory Agency. However, the lack of objective criteria can lead to completely contradictory and opposing conclusions of the principle of proportionality, as could be seen in the analysis of the vote of Minister Dias Toffoli and Minister Marco Aurélio in RE 627189[94].

The role of the judiciary, in applying the precautionary principle, is directly connected to the legality control of the activities regulated by the executive branch. Management has the technical capacity and competence to apply, in matters subject to regulation, risk management. The EU Commission's understanding of the issue helps to understand the step-by-step approach to risk management. As a first step, the precautionary principle applies when: it identifies potentially negative effects, evaluates available scientific data and assesses the extent of scientific uncertainty. From then on, if the risk is high, measures must be adopted by legal acts and research must be fostered for the constant improvement of knowledge in that risk. These are common guidelines for applying the principle: a scientific assessment of the degree of uncertainty, a risk assessment and potential consequences, and the involvement of stakeholders in the study of precautionary measures as soon as the results of the studies are demonstrated[95].

From the identification of these criteria, the legal interpretations for the application of the principle should have them based. In addition, the substantive and procedural measures used to implement the principle must also be based on objective criteria.

2. 2. 2 *CRITERIA LINKED TO LEGAL MEASURES BASED ON*

93 On the lack of criteria in the use of the principle see: (MASTRODI, 2014, p. 584).

94 See on the subject the judgments on electromagnetic fields.

95 EUR-Lex. Precautionary principle. Available at: http://eur-lex.europa.eu/legal-content/PT/TXT/?uri=LEGISSUM:l32042. Accessed on: 25. 07. 2017.

THE PRECAUTIONARY PRINCIPLE

The material and procedural legal measures applicable to reduce / eliminate risks should be based on criteria. They may contribute to the analysis of the proportionality and reasonableness of the measure. The following material measures may result from its application: the exploration of alternatives to actions, including non-action; the need for more conclusive studies on the subject through scientific review (precariousness of the measure) (HAUTEREAU-BOUTONNET et al., 2015, p. 11); the requirement of an environmental impact study; the adequacy of the measure to social and economic costs; the analysis of measures adopted in similar cases[96]; examination of the advantages and disadvantages resulting from the action[97].

As for procedural effects, the transfer of the burden of proof to its proponents, and not to victims or possible victims, may be cited; the use of democratic decision-making processes and follow-up of these actions, with emphasis on the subjective right to informed consent.

There are cases in Brazilian jurisprudence in which it is possible to find references to some criteria indicated above[98] mainly in RE 627189, but usually the reference to the criteria is made in a piecemeal and random manner, without a guiding line and a step-by-step way of subsuming the application of the principle to objective criteria. Each of these criteria will be detailed in the articles in the book. In spite of this detailed later approach, three main conclusions contradict these criteria: the limits of the control of legality done by the judiciary when evaluating administrative measures; the administrative and judicial control of social tolerance when it comes to risks; the need to adapt judicial and administrative measures to scientific innovations and developments.

96 STF, RE 627189, decision of June 8, 2016.

97 EUR-Lex. Precautionary principle. Available at: http://eur-lex.europa.eu/legal-content/PT/TXT/?uri=LEGISSUM:l32042. Accessed on: 25. 07. 2017.

98 STJ, Agravo Regimental, 1863 / PR, decision of February 18, 2009. In this case, the Court mentions the principle of proportionality as a criterion, in addition to the assessment of not having an important effect on the economy. Or the judgment handed down by the Federal Court of the 4th Region, civil Appeal n. 2003. 710401884-80 / RS, decision of 24 March 2010, to the contrary, invoking the principle of reasonableness as a limiting factor in the application of the precautionary principle, to justify the possibility of introducing exotic fish specimens (tilapia Nile and catfish) in the Uruguay River basin, given that the Judiciary could not forever implant the Administration, especially when there is scientific doubt and this can be overcome by the evolution of science.

With respect to the first conclusion, the case of the electromagnetic fields is emblematic, since it involved an analysis between the risks of the activity and the parameters normalized by the executive power. The analysis of legality was limited to the parameter defined by ANEEL for environmental risk, a parameter based on technical and scientific studies discussed in public hearings, the result of which is regulated by regulations. The use of scientific parameters approximates the precautionary principle of the principle of prevention. When there is, in the concrete case, compiling standards of parameters to be respected by a given activity, the applicable principle is the principle of prevention. The main difference in the application of the precautionary principle is linked to scientific uncertainty and the need to adapt more flexible and open measures to scientific innovations on the subject. Depending on the severity and the irreversibility of the risk, the measure may be different for each specific case.

Thus, the legal measure ordered by administrative or judicial power, in a context of risk, by the basis of the precautionary principle, must be proportional to the level of risk associated with a given economic activity. In view of this, judges should choose the option of regulation (prohibition, previous studies, stricter controls, among others) that is strictly necessary for the protection of health and the environment. The mere paralysis of activity is not at times compatible with the precautionary principle but with the principle of prevention. In addition, the legal measures applied must be economically viable. This logic is explicitly present in the formulation of the precautionary principle[99] of the Rio Declaration. The prohibition of the construction of an industry or fishing activity in a disadvantaged region of Brazil can have social consequences for the individuals who depend on that economic activity.

In Brazil, the disorderly use of the principle"*in dubio pro natura*"(BRYNER, 2015, pp. 245-258)[100] may not take into account relevant social issues. In this section can be mentioned the cases involving

99 Principle 15 of the Rio Declaration: "In order for the environment to be protected, preventive measures will be implemented by States according to their capabilities. Where there are threats of serious or irreversible risks, the lack of full scientific certainty will not be used as a reason for postponing cost-effective measures to avoid environmental degradation".

100 Brazilian jurisprudence, specifically the STJ broadly accepted the principle"in dubio pro natura", see: STJ, Special Appeal no. 1,198,727 / MG, decision of August 14, 2012 ; Ans n. 1,328,753 / MG, decision of May 28, 2013 ; Ans n. 1,367,923 / RJ, decision of August 27, 2013.

the importation of crustaceans wild game fruits in Argentina, given the possibility of introducing viral diseases in national shrimp farming[101] and the reduction of fishing production due to the construction of hydroelectric power plants[102]. In these situations, the fishing activity (industrial or artisanal) and tourism, fundamental for some regions, can be disproportionally affected[103]. Therefore, social participation and risk tolerance for some regions may be different from what is tolerated in another region, which should be taken into account in the case-by-case analysis.

There must be a constant reexamination of the facts before the updating of the scientific investigation, given the precariousness of the existing knowledge at the moment of delivery of the judicial measure. It means that the injunction or sentence should have a transitional character and be subject to periodic revisions. However, since this is not a characteristic of the Brazilian civil process, since it must move towards an outcome, its manifestation can not be understood by the Administration as final or definitive. A relevant point of the rapporteur's vote on the case on electromagnetic fields judged by the Supreme Court in 2016[104] was to indicate that the decision could subsequently be amended to the extent that scientific advances require such a change.

Once a judicial decision has been made, as in the abovementioned cases of GMOs or electromagnetic fields, it is the duty of the administration, either during the licensing process or in the monitoring phase, to incorporate scientific innovations, as guiding element of its actions. It is defended, then, the existence of administrative discretion mitigated by scientific evolution and constant monitoring of the mitigating and compensatory measures presented in the environmental impact study. This characteristic is necessary precisely because of the uncertainty and is closely related to the fact that science is always in development.

In the case of the electromagnetic fields in the STF, the updating of the scientific knowledge, result of public hearing and other studies that

101 TRF 1 the Region, Appellate Offense n. 0036457-12. 2013. 4. 01. 0000, decision of April 6, 2016;

102 STJ, Agravo regimental no Agravo in Special appeal no. 206,748, decision of February 27, 2013.

103 STJ, aggravated by the suspension of injunction and sentence n. 1. 302 / PE, decision of 03 November 2011.

104 STF, RE 627189, decision of June 8, 2016, p. 44.

were verified by the agency, brought new parameter of exposure[105]. Finally, it was assessed that"there are no factual or legal grounds to oblige electric energy concessionaires to reduce the electromagnetic field of electric power transmission lines below the legal threshold set by ANEEL"[106]. However, the rapporteur[107] said,"it is clear that in the future, if there are real and real scientific and / or political reasons for the review of what has been decided in the normative framework, the space for these debates and the taking of new decisions must be respected".

In sum, the identified criteria are approaches or techniques to deal with the risk of irreversible damage in decision making and become objects of evaluation in an analysis of the legality of the action possibly violating the right to health or environmental, under judicial examination. Thus, techniques based on the precautionary principle are based on material and procedural measures, such as: the exploration of alternatives to actions, including non-action; the requirement for more conclusive studies on the subject through scientific review (precariousness of the measure); the requirement of an environmental impact study; the adequacy of the measure to social and economic costs; the analysis of measures adopted in similar cases; the examination of the advantages and disadvantages resulting from the action; the transfer of the burden of proof to its proponents and not to the victims or potential victims; the use of democratic decision-making processes and follow-up of these actions, with emphasis on the subjective right to informed consent.

FINAL CONSIDERATIONS

The implementation of the precautionary principle in Brazil has repercussions on the prevention and remedying of environmental impacts, but there are limits to the accuracy of the legal nature of the principle and the criteria that should be used by administrative authorities and

105 This is Normative Resolution 616/2014 of the National Electric Energy Agency (ANEEL). On the amendment, n the terms of the decision:"The new regulations resulted not only from the conclusions drawn from the public hearing conducted by ANEEL (nº 97) in the year 2013, instituted with a view to collecting subsidies and additional information for the improvement of the previous Resolution Regulation 398/2010, but also took into account the new reference levels for magnetic fields in 60 Hz, which, at the end of 2010, went from 83. 33 μT (microteslas) to 200 μT (microteslas) to the general public, and from 416. 67 μT (microteslas) to 1000 μT (microteslas) for the relevant workers, according to the values established in the official ICNIRP document". STF, RE 627189, decision of June 8, 2016, p. 29.

106 STF, RE 627189, decision of June 8, 2016, p. 36.

107 STF, RE 627189, decision of June 8, 2016, p. 44.

judges. Three central conclusions can be considered: (1) administrative authorizations for potentially polluting activities can be modified by implementing the principle; (2) the reversal of the burden of proof is an effect in the context of easing the causal link of civil liability; 3) there are limits to the interpretation of the precautionary principle, linked to the precision of its legal nature and to the provision of more objective criteria for its application.

Administrative authorizations for activities involving a risk to the environment and health can be modified on the basis of the interpretation of the precautionary principle. Modifications can be synthesized in the following manner: 1) temporary constraints; 2) cancellation of authorizations; 3) commitments with the continuation of technical or scientific researches on the matter. Other measures such as the demand for intervention of an expert could be subject to legal action. The reasons that are usually the subject of these decisions are the lack of an impact study and the need for further studies. An interesting effect in this case was the elaboration of more concrete norms on the use and the commercialization of GMOs, as an effect of the actions against this activity.

With regard to the measures relating to compensation for damage, the reversal of the burden of proof has been the subject of decisions favorable to its application in the context of environmental damage, which is innovative in this respect. The criticisms that may be made are linked to the conditions for their implementation, given the need for legal certainty for parties who must know precisely when the burden of proof is incumbent on them.

Regarding the limits to the implementation of the principle in Brazil, the article demonstrated that the reality of its application is opposite to the context of international environmental law. In this context, judges and legal practitioners are hesitant to apply the measures that may arise from the precautionary principle, since it is not recognized as a general principle of international law. In contrast, in the context of Brazilian law, judges use the principle as a rule of law. This application, however, is done in a confusing, superficial manner and without academic rigor.

In order for these limits to be overcome, the article summarized

the criteria that could be applied by the administrative authorities and the judges in interpreting the principle. When the judge must apply the principle he must verify whether the risks associated with an activity are scientifically unknown and thus whether the resulting damages are serious or irreversible. In the event of an affirmative answer to these questions, a legality check must be made, based on the existing infraconstitutional norms or the scientific parameters foreseen and the social tolerability related to the actors actively and passively involved in the risks. In addition, proportionate and reasonable measures must be taken to the severity of the risk and the economic and social conditions of the implementation of the prevention or repair of the damage. These measures should be reviewed periodically because scientific knowledge is not static.

REFERENCES

ANTUNES, P. DE B. *Princípio da precaução : breve análise de sua aplicação pelo Tribunal Regional Federal da 1ª região*. maio 2007.

BIRNIE, P. W.; BOYLE, A. E.; REDGWELL, C. *International law and the environment.* 3rd ed ed. Oxford ; New York: Oxford University Press, 2009.

BRYNER, N. S. In dubio pro natura: a principle for strengthening environmental rule of law = In dubio pro natura: um princípio para o fortalecimento do estado de direito ambiental. 2015.

CZYZESKI, P. J. V. Análise jurisprudêncial dos princípios da prevenção e da precaução. **Âmbito Jurídico**, v. XIII, abr. 2010.

DAILLIER, P. et al. *Droit international public: formation du droit, sujets, relations diplomatiques et consulaires, responsabilité, règlement des différends, maintien de la paix, espaces internationaux, relations économiques, environnement.* 8e édition ed. Paris: L.G.D.J., Lextenso éditions, 2009.

ELLIS, J. Overexploitation of a Valuable Resource? New Literature on the

Precautionary Principle. *European Journal of International Law*, v. 17, n. 2, p. 445–462, 1 abr. 2006.

HAUTEREAU-BOUTONNET, M. *Le principe de précaution en droit de la responsabilité civile.* Paris: L.G.D.J, 2005.

HAUTEREAU-BOUTONNET, M. et al. *L'influence du principe de précaution en droit de la responsabilité civile et pénale: regards franco-québécois.* [s.l: s.n.].

KISS, A. C.; BEURIER, J.-P. *Droit international de l'environnement.* 4. éd ed. Paris: Pedone, 2010.

LEITE, J. R. M.; AYALA, P. DE A. *Dano ambiental: do individual ao coletivo extrapatrimonial: teoria e prática.* 6. ed., atual. e ampl. ed. São Paulo, SP, Brasil: Revista dos Tribunais, 2014.

MACHADO, P. A. L. Princípio da precaução no direito brasileiro e no direito internacional e comparado. In: VARELLA, M. D.; PLATIAU, A. F. B.; KISS, A. C. (Eds.). . *Princípio da precaução.* Coleção Direito ambiental em debate. Belo Horizonte: ESMPU : Del Rey, 2004.

MACHADO, P. A. L. *Direito ambiental brasileiro*. São Paulo, SP: Malheiros Editores, 2015.

MALJEAN-DUBOIS, S. *Quel droit pour l'environnement ?* [s.l.] Hachette, 2008.

MASTRODI, J. Ponderação de direitos e proporcionalidade das decisões judiciais = On balancing rights and proportionality of judicial decisions. *Revista Direito GV*, v. 10, n. 2, p. 577–596, dez. 2014.

MILARÉ, E. *Direito do ambiente: doutrina, prática, jurisprudência, glossário.* [s.l.] Editora Revista dos Tribunais, 2001.

MORAES, A. DE. *Direito constitucional*. São Paulo: Atlas, 2014.

NEGRÃO, P. G. *Recurso especial: doutrina, jurisprudência, prática e*

legislação. São Paulo: Saraiva, 1997.

NOIVILLE, C. Ciência, Decisão, Ação: três observações em torno do princípio da precaução. In: VARELLA, M. D.; REDE LATINO-AMERICANA - EUROPÉIA SOBRE GOVERNO DOS RISCOS (Eds.). . *Direito, sociedade e riscos: a sociedade contemporânea vista a partir da idéia de risco.* Brasília: UNICEUB, 2006. p. 32–45.

PRIEUR, M. *Droit de l'environnement, droit durable.* Bruxelles: Bruylant, 2014.

SANDS, P. et al. *Principles of international environmental law.* Fourth edition ed. Cambridge ; New York: Cambridge University Press, 2012.