MISIÓN JURÍDICA

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DOI: https://doi.org/ 10.25058/1794600X.2467

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O princípio *in dubio pro natura* à luz das evidências científicas: responsabilidade do Estado

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Fecha de recepción: 3 de diciembre de 2023
Fecha de revisión: 5 de junio de 2024
Fecha de aceptación: 26 de septiembre de 2024

DOI: https://doi.org/ 10.25058/1794600X.2467

Para citar este artículo:
Sanabria-Rangel, A. (2024). *The in dubio pro natura* principle in the light of scientific evidence: state responsibility. *Revista Misión Jurídica, 17* (27), 207-221.

ABSTRACT

The *In Dubio Pro Natura* has evolved as a separate principle from the precaution principle under environmental law. This article aims to analyse both the *In Dubio Pro Natura* principle and the precaution principle in the light of scientific evidence and state responsibility. The precaution principle applies as a general rule in cases in which there are potential risks of serious environmental damage irrespective of the existence of scientific certainty over the said risks. On the other hand, the *In Dubio Pro Natura* principle offers a higher degree of protection to the environment and their interests than the obligation to act with precaution since it is the basis for preferring the interpretation of norms that grants the highest degree of protection to the environment. The author of this article, argues that in scenarios in which state authorities have a higher degree of responsibility over the handling of a situation and could control the adverse effects of a threat to the environment, public health or sustainability, for instance in extractivist projects, the use of the *In Dubio Pro Natura* principle should be preferred. Conversely, this article examines the global fight against climate change and the setting of global goals in one hand and the potential risks new technologies may have over biodiversity on the other as two examples where the *In Dubio Pro Natura* principle cannot be applied. In the first case, there is scientific consensus over the urgency to address climate change. However, in spite of global commitments, the individual state responsibility and control over this course of action is weak. In the second scenario, the author refers to the

** Artículo de reflexión.*

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regulation to the use of new technologies where national authorities exercise a higher degree of control in cases where there is not enough certainty over the risks posed to the environment or public health. In these cases, the precaution principle is preferred.

KEYWORDS

In Dubio Pro Natura, Precaution principle, environmental law, human rights, right to live in a healthy environment, scientific evidence, scientific certainty, environmental state responsibility, extractivism, climate change.

RESUMEN

El principio *In Dubio Pro Natura* ha evolucionado como un principio separado del principio de precaución de acuerdo con el derecho ambiental. El objetivo de este artículo es analizar tanto el principio *In Dubio Pro Natura* como el principio de precaución bajo la luz de la evidencia científica y la responsabilidad estatal. El principio de precaución es aplicable como regla general en casos en que hay riesgos potenciales de un daño grave al ambiente independientemente de la existencia de certeza científica respecto a tales riesgos. Por otra parte, el principio *In Dubio Pro Natura* resulta más garantista para el medio ambiente y sus intereses que la obligación de actuar con precaución ya que este es el fundamento para preferir la interpretación de las normas que ofrezca el mayor grado de protección al ambiente. El autor de este artículo sostiene que en escenarios en los que las autoridades estatales tienen un mayor grado de responsabilidad respecto al manejo de una situación y puedan controlar los efectos negativos de una amenaza al ambiente, la salud pública o la sostenibilidad, por ejemplo, en el caso de proyectos extractivistas, el uso del principio *In Dubio Pro Natura* debe preferirse. Por el contrario, este artículo examina la lucha contra el cambio climático y el establecimiento de metas globales, por una parte, así como los riesgos potenciales que las nuevas tecnologías pueden tener sobre la biodiversidad, como dos ejemplos en los que el principio *In Dubio Pro Natura* no puede ser aplicado. En el primer caso, existe consenso científico sobre la urgencia de combatir el cambio climático. Sin embargo, pese a los compromisos globales, la responsabilidad estatal individual y el control sobre la línea de acción es débil. En el segundo escenario, el autor hace referencia a la regulación del uso de nuevas tecnologías sobre la cual existe un mayor control de las autoridades nacionales en casos en que no existe suficiente certeza respecto a los riesgos ambientales o a la salud pública que estas plantean. En estos casos se debe preferir el principio de precaución.

PALABRAS CLAVE

In Dubio Pro Natura; Principio de precaución; derecho ambiental; derechos humanos; derecho a vivir en un ambiente sano; evidencia científica; certeza científica; responsabilidad estatal ambiental; extractivismo; cambio climático.

RESUMO

O princípio in dubio pro natura evoluiu como um princípio autônomo em relação ao princípio da precaução no direito ambiental. Este artigo visa analisar ambos os princípios sob a ótica das evidências científicas e da responsabilidade estatal. O princípio da precaução aplica-se como regra geral em casos onde há riscos potenciais de danos ambientais graves, independentemente da existência de certeza científica sobre tais riscos. Por outro lado, o princípio in dubio pro natura oferece um nível mais elevado de proteção ao meio ambiente, privilegiando a interpretação de normas que concedam a maior proteção possível aos interesses ambientais. O artigo argumenta que, em cenários onde as autoridades estatais têm maior responsabilidade na gestão de uma situação e podem controlar os efeitos adversos de uma ameaça ao meio ambiente, saúde pública ou sustentabilidade — como em projetos extrativistas —, o princípio in dubio pro natura deve ser priorizado. Por outro lado, o artigo examina dois exemplos em que esse princípio não pode ser aplicado: a luta global contra as mudanças climáticas e os riscos potenciais de novas tecnologias à biodiversidade. No primeiro caso, há consenso científico sobre a urgência de abordar a mudança climática, mas a responsabilidade e o controle individuais dos estados sobre as ações necessárias são fracos. No segundo caso, envolvendo a regulamentação do uso de novas tecnologias, as autoridades nacionais exercem maior controle, mas sem suficiente certeza sobre os riscos ao meio ambiente ou à saúde pública. Nesses casos é preferido o princípio da precaução..

PALAVRAS CHAVE

In Dubio Pro Natura; Principio de precaución; derecho ambiental; derechos humanos; derecho a vivir en un ambiente sano; evidencia científica; certeza científica; responsabilidad estatal ambiental; extractivismo; cambio climático.

METHODOLOGY

This study is a critical review of existing principles under environmental law which are acknowledged in international and domestic decisions namely, the precaution and the *In Dubio Pro Natura* principles. The author has reviewed both judicial decisions and international instruments together with scientific articles. The aim of this interdisciplinary analysis is to have a better understanding on how the concept of precaution and the obligation to prevent environmental damage would operate and in which cases the scope of the definition of the *In Dubio Pro Natura* principle fits better with the environmental challenges presented. This analysis focuses on the case study of climate change, in particular how scientific researchers attempted to translate environmental obligations into specific goals to combat climate change. Following this, the article examines the case of potential risks to health and biodiversity caused by electromagnetic radiation. In this case it is observed a potential gap between scientific research and the existing legal frameworks as well as the limitations of the precaution principle.

1. INTRODUCTION

Scientific evidence has an important role in the legal determination of environmental rights, in particular the right to live in a healthy environment. It is henceforth reasonable to assume that executive and judicial decisions concerning environmental rights will be based on science. However, interpretation of scientific evidence is not always a clear-cut issue. For instance, scientific evidence can assess certain risks associated to human activities but at the same, the set of actions needed to address the said risks could fall under a spectrum. Consequently, the discussion would evolve to ask based on this information, which goals are attainable and which actions are feasible for state actors to take in order to protect environmental rights.

In other occasions, environmental risks are well-established. However, the link between the responsibility of individual states could be more diffuse when environmental damage is caused by the collective action of mankind, in particular by the world dominant vision of growth and development. In these cases, global environmental challenges need to be addressed by the joined efforts of the international community. What would be the state responsibility to protect and prevent further environmental damage in the light of scientific evidence? This article aims to examine this question bearing in mind the precautionary and the "*In Dubio Pro Natura*" (When in doubt in favour of nature) principles.

The precautionary principle is defined by the European Environmental Agency as a legal justification to act in order to avoid or limit potential threats to health or the environment. Accordingly, in situations in which there is scientific evidence pointing out to the aforementioned negative consequences, state actors should take precautionary measures in order to avoid these harmful effects in spite of the complexity of the information or if the risk assessment is inconclusive[1]. In a similar fashion, the European Commission stated that precaution should be taken when there is reasonable evidence pointing out to potential risks to the environment, human, animal or plant health[2]. The United Nations Framework Convention on Climate Change states that precautionary measures in relation to the fight against climate change should aim to "anticipate, prevent or minimize" its causes and "mitigate its adverse effects"[3]. Furthermore, the 1992 Rio Declaration defines this principle as a set of cost-effective measures that should be taken by states according to their capabilities in order to prevent serious and irreparable environmental damage[4].

The *In Dubio Pro Natura* is a further development of the Precaution Principle. Analogous to the In Dubio Pro Reo principle in

1. EUROPEAN ENVIRONMENT AGENCY (2013), Late lessons from early warnings II: science, precaution and innovation report 1/2013.

2. Communication from the European Commission on the precautionary principle (COM(2000) 1 final, 02 February, 2000.

3. United Nations Framework Convention on Climate Change, 09 May 1992, Art. 3.

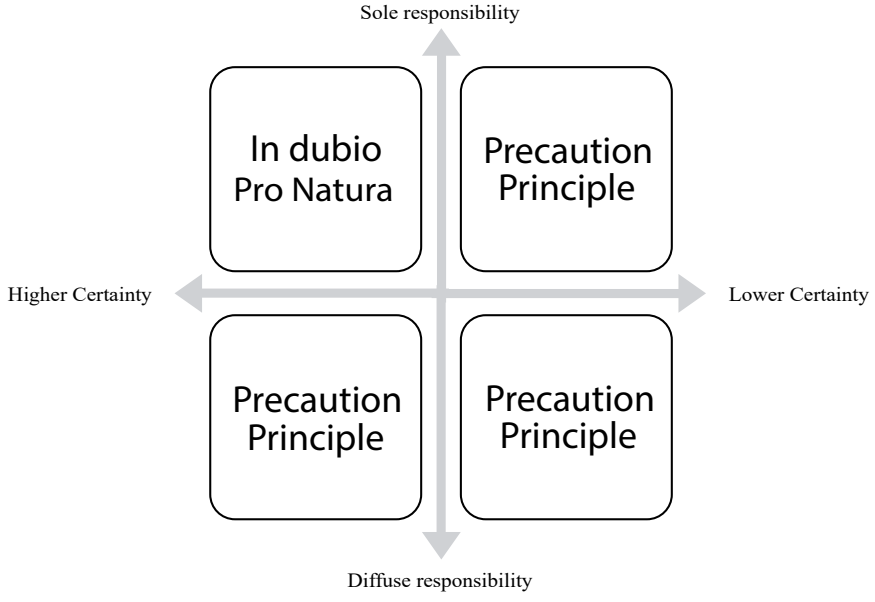
4. Rio Declaration on Environment and Development, 14 June 1992.

criminal law, the *In Dubio Pro Natura* principle requires in case of a lack of clarity or ambiguity in the interpretation of applicable laws to solve the issue in the most favourable manner for the preservation of the environment[5]. Following this definition, the *In Dubio Pro Natura* would require a higher degree of protection than the Precaution Principle because the latter is applicable when scientific information on the risks posed to the environment are not fully clear but the lack of action could potentially cause negative consequences on the environment or to health. Conversely, the *In Dubio Pro Natura* principle could be invoked in cases where there are two conflicting legal interpretations, one that offers a higher environmental protection which would be the one preferred. In this scenario, it is not necessary to exist an ambiguity around scientific evidence or the risk of environmental degradation.

Baldin argues that the *In Dubio Pro Natura* principle is a well-developed regional custom in Latin America since it has been invoked in the jurisprudence of different countries in the region and this principle has been constitutionalized in different countries. Baldin further states that, following the conclusions of the International Law Commission, the *In Dubio Pro Natura* can be considered a general principle of international law. This conclusion is reached taking into account the acknowledgment process of the right to a healthy environment by a majority of states in their constitutions.[6]

Accordingly, the premise of this article is that both the precautionary and the *In Dubio Pro Natura* principles require states to base their decisions on the available scientific evidence pointing out to potential risks to the environment or to health. However, the degree of responsibility to act varies depending of the degree of certainty based on scientific evidence in first place, as well as if the state as an actor could bear the sole responsibility to protect the right to a healthy environment or if this responsibility is diffuse to the point that members still have a responsibility to act with precaution individually but in order to tackle this issue, coordinated global action by states is required. The figure below illustrates the relation between these two variables:

Figura 1



5. ROBINSON, N. (2014), Fundamental Principles of Law for the Anthropocene? in Environmental. Policy & Law, 44, 2014.

6. BALDIN, S. et. al (2022), The In Dubio Pro Natura Principle: an attempt of a comprehensive legal reconstruction, Revista General de Derecho Público Comparado 32/2022, pp. 168-199.

The present article will examine the role of scientific evidence in the definition of the scope of the right to live in a healthy environment with particular emphasis on the responsibility to prevent environmental and health damages. Following this sub-chapter, the article will focus on two different case studies in which scientific certainty and state responsibility need to be taken into account. Firstly, global warming and set goals by states to mitigate and reverse the impact of this threat to the environment. Secondly, threats to human health posed by both human activities as well as unforeseeable risks derived from the use of new technologies. Thirdly, the article will examine what the *In Dubio Pro Natura* principle entails and why the author of this article considers that the application of this principle would contribute to a higher protection of the environment, public health and sustainability in cases related to extractivist projects. Finally, a summary of the relevant conclusions will follow.

2. SCIENTIFIC EVIDENCE: DEFINING THE SCOPE OF ENVIRONMENTAL RIGHTS AND THE PRECAUTION PRINCIPLE

Scientific evidence plays a main role in the understanding of the right to a healthy environment. For instance, the European Court of Human Rights examined in *Tătar vs. Romania* among other arguments, the lack of a proper consideration to the scientific evidence on the serious negative consequences human activities could cause over the health and wellbeing of the plaintiffs in this case[7]. Notwithstanding that this case centred around a violation to the right to private life, the Court found that the state failed to conduct studies before authorizing a mining project and to examine the already existing ones. As a consequence of not properly evaluating the potential risks associated with the extractivist activity and informing the community of the risks, Romania did not act with precaution. Therefore, there was a link between the inaction of the state and the environmental accident at the Baiae Mare gold mine, the pollution liberated and the damage to the health of the victims in this case. Conversely, the role of the state in similar cases should be, not only to acknowledge the existing scientific evidence on the risks associated with certain human activities, but also to proactively take actions to prevent any potential violations to the rights of the individuals that may be affected should a damage to the environment is caused. In the presented scenario, the degree of certainty regarding the risks associated with the mining operations outweighs other considerations. Furthermore, the degree of responsibility should be higher for a state in a scenario in which potential harm to the environment or to human health would be under their control should the authorities take the appropriate measures. I would argue that in these scenarios in which the responsibility lies solely in the state and scientific evidence points out to a high degree of certainty over the risks to health or the environment, it is mandatory to act following the *In Dubio Pro Natura* principle, that is using the highest degree of precaution required. This would go beyond the mere obligation to act with precaution that was found out by the European Court of Human Rights in the case cited above.

On the other hand, there could be scenarios in which a risk to the environment or to health is certain according to scientific evidence but the responsibility to minimize or avoid these risks do not depend on the actions of a single state. Under these circumstances, the responsibility to protect the right to health and to live in a healthy environment is limited to an obligation to act with precaution. This precaution is assumed to be linked to what the existing scientific information guides the authorities to act. For instance, at the beginning of the Covid-19 pandemic, the World Health Organization summarized in one of its initial statements some of the measures states should take into consideration in their health policies to prevent the spread of the virus. These measures included the implementation of six criteria to assess whether restrictions on gathering and movement could be lifted or not based on the number of transmissions, the capabilities of the health system, the outbreak risks, the implementation of preventive measures, the manageability of importation risks and asserting that communities were informed, fully educated and engaged to adjust to the "new norm".[8] It is thus reasonable in this scenario to expect from

7. Tătar vs. Romania, European Court of Human Rights, no. 67021/01, January 27, 2009, paras 98-125

8. WORLD HEALTH ORGANIZATION (2020), WHO Director-General's opening remarks at the media briefing on COVID-19 - 13 April 2020, World Health Organization, 13 April, 2020 <https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19--13-april-2020 >, accessed 30 August, 2023.

health authorities to take the necessary measures to protect human and animal health after the outbreak of a pandemic to the furthest extent possible based on the available information. This would require to impose or lift restrictions based on clear criteria and to take preventive measures to limit the spread of the virus. The imperative for the authorities aligns more with the definition of the precaution principle than the *In Dubio Pro Natura*. Firstly, because the aforementioned efforts which were expected from states were aimed at mitigating the impact of the health crisis by limiting the spread of the virus, empowering the population giving them enough information and increasing health capabilities. Secondly, because in situations in which the joint effort of the international community is required to address environmental or health challenges, state responsibility is diluted. Thirdly, because in cases in which the *In Dubio Pro Natura* would be applicable it is expected for states to go above and beyond making the interpretation of the existing laws and policies that would be most favourable for the protection of the environment. Conversely, acting with precaution would require to make a balance among the different interests in contention, protect and prevent a further violation to the right to public health in this case according to the means available.

3. ENVIRONMENTAL CHALLENGES: BETWEEN SCIENTIFIC CONSENSUS AND DIFFUSED RESPONSIBILITY THE FIGHT AGAINST CLIMATE CHANGE: SET GOALS

In the discussions surrounding the fight against climate change it is often cited scientific consensus around the topic and its co-relation with human activities that have aggravated this phenomenon for centuries, in particular since the starting of industrial revolution[9]. In contrast, it is often highlighted the disconnection between the measures implemented by states or the lack of action with the real threat climate change poses to societies. Notwithstanding, this consensus surrounding the consequences climate change will have over the environment, human health and the sustainability of different environments, the way environmental policies should address these questions, particularly when it comes to translate them to long-term commitments is a more complex topic to discuss.[10]

The discussion can be summarized in the following terms: there is a broad agreement related to the imminent danger to the environment and to human life, in particular of the communities that would be most impacted by climate change. However, disagreements persist when it comes to the question of how to act in accordance with scientific evidence in this topic. This state of affairs is observed in some judicial decisions on the topic. The Human Rights Committee decision in *Ione Teiota* exemplifies the difficulty to assess future consequences of phenomena such as climate change. Firstly, in this decision the Committee acknowledges climate change as one of the most pressing and serious threats to people's lives which could be relevant to assess an asylum request. However, this decision fell short of concluding that not properly addressing the future actions (or inaction) to tackle climate change and their humanitarian consequences amounted to a denial of justice in this case[11].

In this order of ideas, the adoption of the 1.5°C objective from the 2015 Paris Agreement as the maximum acceptable limit for global warming could be regarded as one concrete effort to build the bridge between the scientific certainty around the challenge posed by climate change and concrete state responsibility to address this challenge[12]. However, this aspirational target has been questioned for diverse reasons. From a scientific perspective, the 1.5°C target relies on the concept of political calibration. The concept proposed by van Beek et al. is "a process of iterative adjustment between modelers and policymakers, in which the fit and focus of the model analysis and the requirements of the policy community are negotiated."[13] Moreover, Guillemot and Cointe found out that, in this

9. ORESKES, N. (2005), Beyond the Ivory Tower: The Scientific Consensus on Climate Change, in Science (New York, N.Y, vol. 306), 1686.

10. WATSON, RT et al. (2001), Global Climate Change- the latest assessment: Does global warming warrant a health warning?, in Global Change and Human Health, Volume 2, No. 1, 2001, p. 69.

11. Human Rights Committee, no. 2728/2016, October 24, 2019, paras. 9.3-9.5, 9.12.

12. Paris Agreement to the United Nations Framework Convention on Climate Change, Art.2, December 12, 2015.

13. VAN BEEK, L., ET AL (2022). Navigating the political: An analysis of political calibration of integrated assessment modelling in light of the 1.5C goal. Environmental Science and Policy, 133, 193–202, p. 198. <https://doi.org/10.1016/j.envsci.2022.03.024>.

process of translating scientific modeling of future scenarios to fight climate change linked to actions to mitigate its impact, modelers need to make generous assumptions "stretching models to their limits" using strong assumptions in order to achieve the 1.5°C target[14]. Following this reasoning, some authors considered the 1.5°C as a mere "global ambition" designed to meet the demand of poor and vulnerable nations and its feasibility a less significant topic[15]. In short, the discussion surrounding climate change and how it is translated in state responsibilities becomes a discourse that intends to match obligations to the scientific consensus on the current threat to nature and human life. However, the final agreements and goals set still end up becoming symbolic measures. In this order of ideas, the current state of affairs points out to a disconnection between scientific certainty surrounding the imminence of the risks to human life, the environment and sustainability and individualized responsibility. Consequently, the precaution principle plays a role to fill this gap on how states should act.

Article 3 of the 1992 United Nations Framework lists as a guiding principle in the efforts to combat climate change in principle 3 the obligation for signatory states to take precautionary measures "to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects" while at the same time acknowledging that the individual efforts by states to prevent irreversible damage of the environment are insufficient and international cooperation is fundamental[16]. The Inter-American Commission on Human Rights mentioned on its 2019 report on business and human rights how it considers the precaution principle operates in relation with the fight against climate change. According to the Commission, in this context acting with precaution requires for states to regulate businesses to prevent that their actions worsen climate change. In addition to this, state actions should be guided by current scientific evidence, following the precaution principle. At the same time, it is expected that states work together with private companies to take measures allowing environmentally-sustainable forms of production and consumption[17]. In a report about the application of the Precautionary Principle in cases related to energy transition to net zero emissions, global warming and climate change the OECD reviews the application of this principle in decision-making processes. Some of the conclusions are that, the precautionary principle requires decision-making bodies to base their decisions on the evidence to assess risks involved. In addition to this, the report mentions the importance of participation mechanisms and public involvement to evaluate the risks posed by new technologies. On the other hand, it stressed that the precautionary principle should be reviewed when new evidence becomes available in order to draw lessons learned from the implementation of the precautionary measures taken. The report suggests that a continuous process of learning from experimentation and adaptation should be conducted. As information and technology develops, scientific uncertainty would decrease to potentially the moment in which precaution is not needed[18]. This is important taking into consideration that in order to transition from a fossil-fuel based to a greener economy, new technology is needed. Therefore, when the precautionary principle operates the potential benefits that new technologies would bring are weighed against the potential harm they could cause to the ecosystem and the people. Precaution is exercised to avert scenarios in which negative consequences are irreversible by the time strong evidence becomes available if precaution is not employed[19].

4. THE PRECAUTION PRINCIPLE BEFORE SCIENTIFIC UNCERTAINTY

Balancing technological advancement and potential risks to human and animal health

Potential harms to human or animal health caused by new technologies require states and intervening parties to follow the precaution

14. COINTE, B. et al (2023), A history of the 1.5°C target. WIREs Climate Change, 14(3), p. 7 e824. <https://doi.org/10.1002/wcc.824>

15. TSCHAKERT, P (2015), 1.5C or 2C: A conduit's view from the science-policy interface at COP20 in Lima, Peru. Climate Change Responses, 2, 3.<https://doi.org/10.1186/s40665-015-0010-z>

16. 1992 United Nations Framework Convention on Climate Change, Article 3 (3)

17. Inter-American Commission of Human Rights (2019), Businesses and Human Rights: Inter-American Standards" report, adopted by the Inter-American Commission of Human Rights, November 01, 2019, para. 246.

18. OECD (2023), Understanding and Applying the Precautionary Principle in the Energy Transition, OECD Publishing, Paris, <https://doi.org/10.1787/5b14362c-en>, pp. 15-17.

19. Supra 2

principle. However, the nature of this imperative to act with precaution has a different origin from the expected precaution that should be taken in the context of the risks posed by climate change. Risks to health could be better addressed by states in their jurisdictions notwithstanding the collective efforts to fight pandemics and health risks that go beyond the borders of one country. Therefore, in cases in which uncertainty over the risks that a policy, practice or inaction could have over public health, the urgency to act as individual state parties is stronger. Conversely, in the case of the challenge posed by climate change scientific uncertainty is in many cases lower to inexistent compared to risks associated to health hazards. However, the difficulty to link scientific certainty to concrete, enforceable obligations weaken individualized obligations to the precaution principle. This in spite of climate change being one of the most urgent threats to life and the survival of future generations.

As it was mentioned above, the obligation to act with precaution is founded on the existence of a degree of uncertainty in every human decision. Environmental and health decisions should balance the benefits associated to new technologies or economic projects for instance over potential risks. In some cases, the mere existence of uncertainty and the potential of irreparable damage makes the burden of scientific uncertainty incompatible with human rights protection. According to Korthals, actors in charge of taking decisions to protect the right to live in a healthy environment should decide which are important, major uncertainties and which are minor unimportant ones and act accordingly[20]. Consequently, public and private parties play a fundamental role identifying potential risks to human health and the environment in scenarios which, in some cases there is not firm evidence that allow to discard this risk or the evidence is insufficient. Institutions have a fundamental role to bring a degree of certainty in cases in which scientific evidence is inconclusive on the risks to human or animal health[21]. However the decision process of choosing between major uncertainties and unimportant ones should not be arbitrary. In these cases, the role of the policymaker or judge is to review the available scientific evidence over the safety or potential risks in contention and ponder the weight of the arguments in both directions as well as to take into consideration if a disregard to the evidence pointing out to health risks could lead to serious, irreversible damage.

For instance, in the 2000s the potential adverse effects from exposure to electromagnetic fields from cell phones and base stations was a cause of concern in many countries. The concern originated in the 90s after the starting in popularization of mobile phones[22]. Following media report on the alleged risks to health in the United Kingdom people organized, demanding that phone masts would not be installed in certain areas of concern[23]. In 2000 the Independent Expert Group on Mobile Phones concluded that there was not enough evidence pointing out to risks to health caused by the exposure to radio frequency radiation. However, at that stage it recommended the use of "a precautionary approach to the use of mobile phone technologies"[24]. As a consequence of the existing uncertainty, countries addressed the issue imposing rules on the selection of base station and the levels of acceptable exposure to electromagnetic fields in different European countries[25]. This case exemplifies how the precautionary principle could be triggered by reasonable doubts from the public surrounding the potential harm that a new technology may have which could be addressed by the actions of the state reinforcing the importance of acting pre-emptively. Nevertheless, if the application of the precaution principle relies heavily on the public perception of risk it could become a double-edged sword. In one hand, it has been documented that the application of precautionary measures could increase the perception of dealing with a real risk related to new technologies instead of communicating the message that institutions adopted a precaution approach (because of the

20. KORTHALS, M. (2011), "Ethics of environmental health", The SAGE handbook of health care ethics: Core and emerging issues, 2011, 413-426, p. 424.

21. DOUGLAS, M. (2001), "Dealing with uncertainty", Ethical perspectives (vol. 8 no. 3), 145-155, p. 148

22. BURGESS, A. (2004), Cellular phones, public fears, and culture of precaution. Cambridge: Cambridge University Press, pp. 75-97

23. LAW, A. and MCNEISH, W. (2007), Contesting the new irrational actor model: a case study of mobile phone mast protest. Sociology, 41 (3), 439-456.

24. IEGMP, (2000), Mobile Phones and Health. Chilton, UK:Independent Expert Group on Mobile Phones, National Radiological Protection Board, p. 3.

25. WIEDEMANN, P. and SCHÜTZ, H. (2005), The Precautionary Principle and Risk Perception: Experimental Studies in the EMF Area, Environmental Health Perspectives 113:4 CID, p. 402, <https://doi.org/10.1289/ehp.7538>

ISSN 1794-600X Número 27 • Julio - Diciembre de 2024

existing uncertainty) to protect public health[26]. On the other hand, it must be acknowledged that public perception of risks could decrease with time as people get more used to new technologies.

As a consequence, if public pressure decreases, there is the risk that precautionary measures are circumvented by enforcing authorities without pondering whether the precautionary approach is still necessary or not. For instance, on the aforementioned example, as new communication technologies have become widespread and the public concern decreased, policymakers have tended to emphasize on the economic benefits and potential, linking them to development goals. In 2020, the Council of the European Union published its "Shaping Europe's digital future" conclusions report. These conclusions included a recommendation to financially support the investment of 5G network and service solutions and to incentivise the development of technology capacities in 6G[27]. In order to promote these goals, the conclusions put the focus on the economic benefits and potential of 5G and 6G capabilities over potential concerns giving the impression that they have been fully addressed. Nevertheless, there is evidence that electromagnetic radiation could be a complimentary driver for the decline in insects[28]. A recent research review also documents the impact that electromagnetic radiation has over wildlife's migration, reproduction, mating and longevity cycles[29]. Moreover, according to Gandhi, safety tests for cell phones underestimate real exposure levels that go beyond the accepted safety limits for real life exposure to radiofrequency when phones are closely held to the body[30]. These findings has led to the conclusion that due to the appeal of 5G technologies, governments have failed to act with precaution, ignoring research reports on the harmful effects from radiofrequency radiation to human health and biodiversity[31].

This is precisely one of the weakest aspects to the obligation to act with precaution. In a scenario in which scientific uncertainty persists but the sense of emergency has faded, the precautionary measures could gradually weaken. The strength of the precautionary principle resides in part, in a proper communication of risks to human and environmental health and at the same time, that judicial review gives proper consideration to scientific evidence in this topic. Jansen discussed the different stages of scientific uncertainty surrounding environmental health risks and the role of communication. In his review, Jansen considered four different levels of scientific uncertainty. In the first case, there is a total uncertainty regarding the probability of negative consequences to human life and the environment. In the second case, there is an identified risk. Nevertheless, at this stage it is not possible to conclude how serious in nature or degree this risk is. Therefore, further research is needed to understand the short- and long-term consequences a given risk could have over environmental health. Thirdly, there could be uncertainty over the nature of the risks. This means that a threat to human health has been identified but it is still debated if there is an "acceptable degree of exposure" that would not be detrimental to human health. Finally, Jansen makes reference to scenarios in which a co-relation between a factor and adverse effects to human health or adverse effects to the environment are suspected but not yet proven[32]. In all the hypothetical situations presented the application of the precautionary principle is fundamental.

This assertion is of particular importance in the third scenario described above in which the discussion centres around finding an acceptable level in which a policy or practice could take

26. Ibid, p. 404.

27. COUNCIL OF THE EUROPEAN UNION (2020), Council conclusions on shaping Europe's digital future. Brussels, para 35, <https://www.consilium.europa.eu/media/44389/st08711-en20.pdf>.

28. BALMORI, A. (2021), Electromagnetic radiation as an emerging driver factor for the decline of insects, Sci Total Environ 2021;767: 144913, <https://doi.org/10.1016/j.scitotenv.2020.144913>.

29. LEVITT, BB, LAI, HC, MANVILLE, AM. (2021), Effects of non-ionizing electromagnetic fields on flora and fauna, part 1. Rising ambient EMF levels in the environment, Rev Environ Health 2021;37:81–122. <https://doi.org/10.1515/reveh-2021-0050>.

30. GANDHI, OP. (2019), Microwave emissions from cell phones exceed safety limits in Europe and the US when touching the body, IEEE Access 2019.

31. NYBERG, N., MCCREDDEN, J., WELLER, S. & HARDELL, L. (2022), The European Union prioritises economics over health in the rollout of radiofrequency technologies, Reviews on Environmental Health, <https://doi.org/10.1515/reveh-2022-0106>

32. JANSEN, T. et al. (2017), Breaking Down Uncertain Risks for Risk Communication: A Conceptual Review of the Environmental Health Literature, Risk, Hazards & Crisis in Public Policy vol. 9, Wiley Periodicals, 4-38, pp. 20-21

place while protecting the environment as well as human and animal life. In this case, the precautionary principle should prevail, in general, in the process of deciding where to trace the red line between protecting the environment and health and promoting innovation and economic interests. This would imply not to fall into the misconception of interpreting risks as mere probabilities. Furthermore, it must be stressed that probabilistic projections as an instrument should not lead to construct environmental or health risks as abstract probabilities. On the opposite, scientific research quantifying risk factors should be interpreted to further protect basic human rights principles including human dignity which would not be protected if the associated risks are seen as a mere statistic[33].

In contrast, Aven proposes to focus on how health risks are handled as a more decisive element to evaluate whether authorities are acting with precaution or not[34]. In practice, this would imply that authorities should have a more proactive role, acknowledging the continuous existence of a risk in certain activities which will remain even if these risks fall under a level deemed acceptable by the authorities. Similarly, in his study around the responses to the Covid-19 pandemic Brown further elaborated what a proactive response by institutions should comprise in activities in which there will always be an implicit level of risk to health. Accordingly, in these cases institutions have the responsibility to develop strategies, narratives and practices to respond to risk uncertainties[35]. The development of inclusive narratives is an important precautionary factor linked to access to information related to health and environment protection.

5. THE *IN DUBIO PRO NATURA* PRINCIPLE: WHEN SCIENTIFIC CERTITUDE AND STATE RESPONSIBILITY MEET

In this article I have agreed with the assumption that the *In Dubio Pro Natura*, which is accepted as a principle in environmental law in different jurisdictions in spite of some divergences on its definition and scope, is a progression to the obligation to act with precaution. This article has proposed a boundary between the precaution and the *In Dubio Pro Natura* principles based in both scientific certainty and the clarity over the state responsibility and control over the potential environmental or health outcome which could occur should the state authorities decide not to act. Accordingly, the higher scientific certainty over the negative impact that human actions or a lack of acting would have, paired with clear state responsibilities and control over the situation should oblige states to offer the highest degree of environmental protection possible. This would lead us to the *In Dubio Pro Natura* principle which not only requires to act with precaution in case of uncertainty, but to decide in favour of the legal interpretation that would offer the highest level of protection to the right to live in a healthy environment.

This conclusion could be reached from the scope of the precaution principle in environmental law. According to different international instruments referencing the precaution principle, the 1992 Rio Declaration being one of the most relevant in this respect[36], there are three required criteria to trigger the precautionary principle. Firstly, there should be a serious or irreversible environmental damage that is foreseen. Secondly, there is scientific uncertainty surrounding this risk. Finally, there must be a proportionality between the adopted measures taken to avoid the potential damage[37]. Conversely, the *In Dubio Pro Natura* principle would not require the existence of a serious or irreversible damage or scientific doubt surrounding a potential environmental damage which would impact the environment. On the contrary, as Bryner indicates, when the *In Dubio Pro Natura* principle is invoked, there is a preference for decisions which would grant the highest protection or less impact to biodiversity, habitat, ecosystem processes, air and water quality among other interests[38]. This would

33. BROWN, P. (2020), Studying COVID-19 in light of critical approaches to risk and uncertainty: research pathways, conceptual tools, and some magic from Mary Douglas, Health, Risk & Society vol. 22, 1-14.

34. AVEN, T. (2013), The concepts of risk and probability: An editorial", Health, Risk & Society vol. 15 no. 2, 117–122

35. Supra 34.

36. Supra 5, Principle 15.

37. MORAGA, P. (2015), Análisis de la aplicación principio precautorio en el marco jurídico chileno, Moraga, Pilar et al., El principio precautorio en el derecho comparado, Santiago de Chile, LOM, 2015, pp. 15-16.

38. BRYNER, N. (2015), Aplicación del principio In Dubio Pro Natura para el cumplimiento de la legislación ambiental, Congreso Interamericano de Derecho Ambiental, Washington, Organization of American States' General Secretary, pp. 166-168.

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affect the interpretation of laws, policies and norms as well as other aspects of state behaviour. Following this interpretation, this article will focus in one economic activity in which it would be easier to assess its risks to the environment and at the same time, in which state parties usually have a higher degree of control over the application of environmental regulations in place as well as the power to grant licences to operate to private actors and monitor the fulfilment of environmental norms.

Extractivist activities as an example of the *In Dubio Pro Natura* principle in action

This article has previously discussed two instances in which the precaution principle is preferred based on both the lack of scientific certainty and the state responsibility over the measures that are proposed to be adopted in order to prevent the serious or irreversible damage that is foreseen. These elements that were put into consideration mirrors two of the criteria that define the precautionary principle in environmental law mentioned above. The first example that opened this discussion was the fight for climate change and climate change goals in general. In this case, there is a high degree of scientific consensus over the risks that climate change posed to humanity and the need to act. However, it was also pointed out the discrepancies over the feasibility of the set goals by international conventions to prevent the potentially irreversible effects of climate change. At the same time, since these goals are global in nature and their implementation requires joint efforts of the international community, state control and responsibility over these measures would be less clear-cut than in other cases. This would lead us to conclude that, in spite of the pressing topic in question, states are obliged to act following precaution but this obligation has not reached to an obligation to follow the *In Dubio Pro Natura* principle. In a similar fashion, there are scenarios in which there is scientific uncertainty surrounding the alleged negative effects linked to certain human activities which are performed in the jurisdiction of a state. In these cases, states have a higher degree of control over the effects laws, policies and norms may have to limit hypothetical potential adverse effects. However, in this second scenario since there is an ongoing scientific discussion on whether a technology or practice is harmful or not, acting with precaution should suffice to protect the right to live in a healthy environment.

In contrast, there are cases in which scientific certitude over the risks associated conflates with the sole, direct responsibility of the state to protect the environment and public health. In these cases, it would be preferrable to grant a more extensive protection to these rights via the *In Dubio Pro Natura* principle. Extractivist projects are a case in which there is space for the applicability of this principle. As it was previously mentioned, when *In Dubio Pro Natura* is invoked, it is not necessary that the potential risks to the environment reach to a level in which they are deemed serious or irreversible. By contrast, *in Dubio Pro Natura* becomes a guiding criterion in a context where societies have developed a new vision regarding their relations with the environment. This criterion would be independent of acknowledging a set of rights to nature or the recognition of the right to live in a healthy environment. Instead, the *In Dubio Pro Natura* principle offers a deference to environmental interests when they are affected by other rights such as economic rights and conflicting visions of development[39]. Therefore, the use of the *In Dubio Pro Natura* principle as an interpreting principle is a useful tool that could be used to find the best alternative for the protection and preservation of the environment and to put a focus to environmental sustainability in mining conflicts.

In this case, state authorities do not only have the possibility to intervene at the moment it grants licenses to exploit non-renewable resources. State authorities can also protect the rights of local communities to participate in a meaningful manner during the adjudication of mining licenses and to supervise the fulfilling of environmental regulations taking in consideration the most favourable interpretation for environmental protection and sustainability. It is also important to mention that non-state parties also play a role in relation to the obligation to protect human rights, which would also be affected as a direct consequence of a lack of protection to environmental rights. The concept of corporate responsibility to respect human rights worths mentioning. The United Nations Guiding Principles on Business and Human Rights (UNGPs) includes on its set of principles

39. Ibid, p. 168.

an obligation for companies to respect human rights. This responsibility is independent of the state's obligations to prevent or minimise long-term environmental damage. Accordingly, private companies should act with due diligence when they perform their activities[40]. In this order of ideas, there should be a continuous dialogue between private parties and public regulators as well as other authorities to assess if all actors act with due diligence to avoid negative consequences over the environment. The author considers that the best way to perform this assessment is by evaluating whether companies follow in their operations safety and health protocols in order not to cause environmental harm. The bodies in charge of making this interpretation of the said regulations should thus prefer the outcome that offers the highest protection to the environment in accordance with the existing scientific knowledge on this area of expertise.

Notwithstanding that regarding human rights obligations, it is generally accepted that private individuals only have an obligation to refrain from taking actions that cause harm to the rights of others, there are circumstances in which third parties are put in a "quasi-state" position which would require from them to show restraint in their operations. One of these scenarios takes place in extractivist projects. The effects that a mining project may have over the livelihoods of a local community and the negative impact it could cause over local biodiversity is reason enough to render this issue high priority. This could be achieved by invoking the *In Dubio Pro Natura* principle when evaluating if parties have adopted all reasonable measures to safeguard the environment.

6. CONCLUDING REMARKS

The *In Dubio Pro Natura* has evolved as a separate principle under environmental law from the precaution principle. The acknowledgment of this principle is a useful interpretative tool for norms and regulations related to environmental and health protection since it would offer a higher degree of consideration to these interests and rights than the general obligation to act with precaution in situations in which serious environmental harms are foreseen. Scientific certainty over the negative consequences human actions may have over the environment, health or sustainability, as well as the degree of control and responsibility over the situation are two factors that should be taken into consideration in decisions regarding the application of this principle.

As a general rule, precaution should always be taken to avoid environmental damage irrespective of whether there is scientific certainty over the said consequences, or if the responsibility and control of the situation lies in one state or the international community. This would apply in cases in which state authorities have a high degree of responsibility over the situation and could control the potential negative effects of the perceived threat but there is not enough scientific certainty surrounding the risks. Furthermore, the precaution principle also operates in the opposite situation, i.e., those cases where there is scientific certainty over the potential threats posed to the environment or public health but these risks could not be tackled by the authorities of one state weakening responsibility of all parties involved.

In contrast there are situations in which state authorities have a higher degree of control over activities taking place under their jurisdiction and there is also scientific certainty over the risks associated to the development of these activities to the environment. Mining and extractivist projects in general can illustrate this scenario. In this case, there is a higher responsibility for the states to regulate these activities under their jurisdiction and ascertain if all parties involved act with due diligence. Consequently, invoking the *In Dubio Pro Natura* principle could be more useful to regulators, policy makers and judicial bodies in their decision-making processes as it offers a broader interpretation of environmental rights. This conclusion is reached in particular in view of the limitation that the general precaution principle has in cases in which the "foreseen serious or irreversible environmental damage" threshold is not met.

40. RUGGIE, J. (2008), Protect, Respect & Remedy: A Framework for Business and Human Rights", Innovations: Technology, Governance, Globalization vol. 3, issue 2, 189-212.

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BIBLIOGRAPHY

- AVEN, T. (2013), The concepts of risk and probability: An editorial", Health, Risk & Society vol. 15 no. 2, 117–122.
- BALDIN, S. et. al (2022), The *In Dubio Pro Natura* Principle: an attempt of a comprehensive legal reconstruction, *Revista General de Derecho Público Comparado* 32/2022, pp. 168-199.
- BALMORI, A. (2021), Electromagnetic radiation as an emerging driver factor for the decline of insects, Sci Total Environ 2021;767: 144913, <https://doi.org/10.1016/j.scitotenv.2020.144913>
- BROWN, P. (2020), Studying COVID-19 in light of critical approaches to risk and uncertainty: research pathways, conceptual tools, and some magic from Mary Douglas, Health, Risk & Society vol. 22, 1-14.
- BRYNER, N. (2015), Aplicación del principio *In Dubio Pro Natura* para el cumplimiento de la legislación ambiental, Congreso Interamericano de Derecho Ambiental, Washington, Organization of American States' General Secretary
- BURGESS, A. (2004), Cellular phones, public fears, and culture of precaution. Cambridge: Cambridge University Press.
- Communication from the European Commission on the precautionary principle (COM(2000) 1 final, 02 February, 2000.
- COUNCIL OF THE EUROPEAN UNION (2020), Council conclusions on shaping Europe's digital future. Brussels; <https://www.consilium.europa.eu/media/44389/st08711-en20.pdf>.
- COINTE, B. et al (2023), A history of the 1.5°C target. *WIREs Climate Change*, 14(3), e824. <https://doi.org/10.1002/wcc.824>
- DOUGLAS, M. (2001), "Dealing with uncertainty", Ethical perspectives (vol. 8 no. 3), 145-155
- EUROPEAN ENVIRONMENT AGENCY (2013), Late lessons from early warnings II: science, precaution and innovation report 1/2013.
- GANDHI, OP. (2019), Microwave emissions from cell phones exceed safety limits in Europe and the US when touching the body, IEEE Access 2019.
- Human Rights Committee, no. 2728/2016, October 24, 2019.
- Inter-American Commission of Human Rights (2019), Businesses and Human Rights: Inter-American Standards" report, adopted by the Inter-American Commission of Human Rights, November 01, 2019.
- IEGMP, (2000), Mobile Phones and Health. Chilton, UK: Independent Expert Group on Mobile Phones, National Radiological Protection Board
- JANSEN, T. et al. (2017), Breaking Down Uncertain Risks for Risk Communication: A Conceptual Review of the Environmental Health Literature, Risk, Hazards & Crisis in Public Policy vol. 9, Wiley Periodicals, 4-38
- LAW, A. and MCNEISH, W. (2007), Contesting the new irrational actor model: a case study of mobile phone mast protest. Sociology, 41 (3), 439-456.
- LEVITT, BB, LAI, HC, MANVILLE, AM. (2021), Effects of non-ionizing electromagnetic fields on flora and fauna, part 1. Rising ambient EMF levels in the environment, Rev Environ Health 2021;37:81–122. <https://doi.org/10.1515/reveh-2021-0050>.
- KORTHALS, M. (2011), "Ethics of environmental health", *The SAGE handbook of health care ethics: Core and emerging issues*, 2011, 413-426
- MORAGA, P. (2015), Análisis de la aplicación principio precautorio en el marco jurídico chileno, Moraga, Pilar et al., El principio precautorio en el derecho comparado, Santiago de Chile, LOM, 2015.

- NYBERG, N., MCCREDDEN, J., WELLER, S. & HARDELL, L. (2022), The European Union prioritises economics over health in the rollout of radiofrequency technologies, Reviews on Environmental Health, <https://doi.org/10.1515/reveh-2022-0106>
- OECD (2023), Understanding and Applying the Precautionary Principle in the Energy Transition, OECD Publishing, Paris, <https://doi.org/10.1787/5b14362c-en>
- ORESKES, N. (2005), "Beyond the Ivory Tower: The Scientific Consensus on Climate Change", in Science (New York, N.Y, vol. 306), 1686.
- Paris Agreement to the United Nations Framework Convention on Climate Change, December 12, 2015.
- ROBINSON, N. (2014), Fundamental Principles of Law for the Anthropocene? in Environmental. Policy & Law, 44, 2014.
- Rio Declaration on Environment and Development, 14 June 1992.
- RUGGIE, J. (2008), Protect, Respect & Remedy: A Framework for Business and Human Rights", Innovations: Technology, Governance, Globalization vol. 3, issue 2, 189-212.
- Tătar vs. Romania, European Court of Human Rights, no. 67021/01, January 27, 2009.
- United Nations Framework Convention on Climate Change, 09 May 1992.
- VAN BEEK, L., ET AL (2022). Navigating the political: An analysis of political calibration of integrated assessment modelling in light of the 1.5C goal. Environmental Science and Policy, 133, 193–202 <https://doi.org/10.1016/j.envsci. 2022.03.024>.
- WATSON, RT et al. (2001), Global Climate Change- the latest assessment: Does global warming warrant a health warning? in *Global Change and Human Health*, Volume 2, No. 1, 2001
- WIEDEMANN, P. and SCHÜTZ, H. (2005), The Precautionary Principle and Risk Perception: Experimental Studies in the EMF Area, Environmental Health Perspectives 113:4 CID, <https://doi.org/10.1289/ehp.7538>
- WORLD HEALTH ORGANIZATION (2020), WHO Director-General's opening remarks at the media briefing on COVID-19 - 13 April 2020, World Health Organization, 13 April, 2020 <https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19--13-april-2020 >, accessed 30 August, 2023.