

CONTEMPORARY INTERNATIONAL ENVIRONMENTAL LAW: THE PRECAUTIONARY PRINCIPLE AND REVERSAL OF THE BURDEN OF PROOF

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ABSTRACT

Assessing the burden of proof concerning the safety of human activities for both health and the environment presents a nuanced and intricate challenge. This paper delves into the evolving standards of burden of proof, examining the application and consequences within international environmental law. It addresses the issue of the allocation of the burden of proving harmlessness between developers and those impacted by activities. Employing a doctrinal research approach, this paper observes a shift in the allocation of the burden of proof in contemporary international environmental law. The paper synthesises that debate over the burden of proof is primarily bifurcated into two perspectives: traditional or treaty and judicial or contemporary approaches. The former posits that the responsibility to prove harmlessness rests with the developer be it private entities or the state to ensure that activities conducted within their jurisdiction do not harm the environment. Conversely, the latter marks a shift where opponents of an activity bear the obligation to furnish evidence of the harmful implications of an activity to be halted.

Keywords: environmental law, precautionary principle, burden of proof, sustainable development

INTRODUCTION

Generally, the allocation of burden of proof is based on three justifications. First, the party wanting a change from the status quo should bear the burden of proof. Secondly, the party with the best access to relevant information or knowledge should bear the burden of proof. Finally, equity considerations, such as resources

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and power, should determine which party bears the burden of proof.¹ Therefore, allocation of the burden of proof in treaty and judicial institutions differs in that the treaty-based approach or traditional model has always requested the developer be it private entities or the state to ensure that activities conducted within their jurisdiction do not harm the environment. Conversely, the latter marks a shift where opponents of an activity bear the obligation to furnish evidence of the harmful implications of an activity to be halted. This means opponents or those who aim to gain environmental protection by opposing potentially harmful activities to provide evidence of the harmful nature of the activities.² In terms of the obligation assumed by states and the onus of proof of harmlessness, it is largely accepted that the burden of proof of harmlessness in traditional environmental laws rests upon the state party which aims to gain environmental protection by opposing potentially harmful activities. This is reflected by the attribution to the state of responsibility for protection of the environment. That is, a state must ensure that any given activity conducted within its territory, whether by a public or a private entity, does not endanger nature and the environment.³

A state's obligation to protect and ensure respect for the environment in international law implies a state's duty to refrain from carrying out activities that will endanger nature, and to ensure that private actions or activities do not cause damage and are harmless to human health, the environment and natural resources within and outside the state's borders.⁴ Because of the various legal bases, objectives, and the fact that the precautionary principle has evolved as a customary

¹ Dayna Nadine Scott, 'Shifting the BOP: The Precautionary Principle and its Potential for the Democratization of Risk' in Law Commission of Canada (ed), *Law & Risk* (UBC Press and Les Presses de L'Université Laval, 2005) 50.

² Arie Trouwborst, *Precautionary Rights and Duties of States* (Martinus Nijhoff Publishers, 2006), 193.

³ States responsibilities under international environmental law. Principle 2 of the Rio Declaration: 'States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources under their own environmental and developmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or areas beyond the limits of national jurisdiction'.

⁴ *Social Economic Rights Action Centre (SERAC) v Nigeria* [2001]155/96 ACHPR 43 [2001]. The decision of the African Commission on Human Rights in the complaint concerned the consequences of environmental degradation in Ogoniland, (2001) AHRLR 60 (ACHPR 2001) 175. See also UN GA Resolution 60/147 A/RES/60/147 'Basic principles and guidelines on the rights to a remedy and reparation for victims of gross violations of international human rights law and serious violations of international humanitarian law' 21 March 2006.

international law principle, the allocation of burden of proof, and the level of the standard of proof becomes a complex matter in environmental cases and difficult to apply for authorities and states. This creates the need for a reversal of the burden of proof, which justifies the obligation of the party with the best access to the relevant information or knowledge, resources, and power to bear that burden. In this context, the allocation of burden of proof aims at providing an integrated analysis of the complex interactions between people who must come forward with proof and must establish certain conclusions of fact by the weight or convincing nature of such proof or proofs. Therefore, it is now clear that the contemporary use of the principle of precautionary has caused a shift in the burden of proof: as the proponents of potentially harmful activities or actors intend to carry out environmentally sensitive activities, it falls on them to demonstrate that these activities shall have or not a harmful effect.⁵

Against this background, this article makes a case on the factors influencing the reversal of the onus of proof of harmlessness from the opponents to the proponents of environmental activities. Previous studies are acquainted with the shift and have established that increasing awareness of the unpredictability, severity, and potential irreversibility of environmental effects of human activities has caused the shift of burden of proof of harmlessness.⁶ Unlike the argument from previous studies, which is based on external factors to the precautionary principle, this article offers two overlapping arguments based on the application of the precautionary principle in contemporary environmental law. These arguments are advanced to support the conclusion as a foreseeable outcome in justifying the reversal of the burden of proof. The legal evolution and application of the principle of precautionary have changed the character of the obligation that lies with burden of proof.

Since the principle is now recognised as a customary international law principle, the nature and content of its *jus cogens* status and obligations *erga omnes* mean that the obligations arising from the principle are “compelling law” and “flowing to all”. In simpler words, it means that all parties, including the opponent and proponent, must comply with the obligations arising therein. Further, equity considerations, such as scientific innovation (resources and power, the use of new technologies and economic costs) always justify the need for the party with such economic resources and power to provide evidence of

⁵ Adriana Fabra, ‘The LOSC and the Implementation of the Precautionary Principle’ (1999) 10 *Yearbook of International Environmental Law* 15.

⁶ Barney Dickson, ‘Fairness and the Costs and Benefits of Precautionary Action’ in Rosie Cooney and Barney Dickson (eds), *Biodiversity & The Precautionary Principle: Risk and Uncertainty in Conversation and Sustainable Use* (Earthscan, 2007).

harmlessness. The justification behind this argument is that those who create danger with their actions are those in the best position to evaluate pros and cons of the action in connection with the environment.⁷ Therefore, society has a right to expect them to assume the cost of risk assessment. Hence this article proceeds in three parts, namely the theoretical framework, the legal evolution of the principle of precautionary, and the impacts of new technologies and resources in the attribution of the burden of proof.

THEORETICAL FRAMEWORK – BURDEN OF PROOF IN ENVIRONMENTAL LAW

According to traditional standards in environmental law, the burden of proof of harmlessness lies with those who oppose potentially harmful activities.⁸ This approach follows the well-known principle of criminal law “innocent until proven guilty”, in that, any economic activity is presumed environmentally friendly until evidence is brought to demonstrate its harmful character. This approach is also borrowed by the judiciary. The presumption of harmlessness and provides a green line for the development of economic activities. In this case, any economic activity is allowed unless it causes harm. The parties opposing an activity or claiming to be affected by the environmental impacts must provide evidence of the harmful effect or damage caused or to be caused. Thus, the core of the traditional approach is that clear and convincing evidence is required from the victims of any environmental harm. This is supported in the *Trail Smelter case* between the US and Canada before the Arbitral Tribunal placed a high evidentiary burden upon Canada as the complainant.⁹

The way the burden of proof is allocated in traditional environmental law hence is compared to criminal law, where many legal systems recognise the fundamental principle of presumption of innocence, the right to remain silent, not to be compelled to give self-incriminating evidence, and not to testify during proceedings.¹⁰ The reasoning behind this system is that incriminating innocents

⁷ Roberto Andorno, ‘The Precautionary Principle: A New Legal Standard for A Technological Age’ (2004) JIBL vol 01 i 11, The Precautionary Principle: A New Legal Standard for a Technological Age (degruyter.com) (accessed 1 September 2024).

⁸ Arie Trouwborst (n2) 193.

⁹ *United States v Canada* [1938 and 1941] 3 RIAA 1905. In the 1938/1941 *Trail Smelter case* the Arbitral Tribunal placed the burden to meet this high evidential standard on Canada, the victim of air pollution from a US smelter: *Trail smelter case* (United States, Canada), 3 UNRIAA, p. 1905, 1952 | Trans-Lex.org (accessed 1 September 2024).

¹⁰ Constitution of South Africa, Act 108 of 1996 Section 35 (3, h).

must be avoided, even if it may cost guilty people to go free. Accordingly, the prosecutor bears a heavy burden of proof to prove beyond reasonable doubt the guilt of a defendant. Such has been the practice under the law of evidence, where the person alleging a fact must bring evidence of the alleged facts. The approach in criminal law echoed the presumption of harmlessness in traditional environmental law. Principle 2 of the Rio Declaration explicitly underscores the content of the presumption of harmlessness. It recognises states' sovereign rights to exploit their own resources in accordance with their environmental and development policies and their duties to ensure these activities have no damage implications or do not cause damage to the environment. It simply provides a green line for development activities until proven otherwise. The parallelism between criminal law and environmental law in use of the precautionary principle reinforces the argument on how the burden of proof has been allocated in traditional environmental law.

However, the approach has been criticised because it creates obstacles for those who object to harmful actions or substances, by requiring them to show considerable scientific evidence, which may not be available or attainable, to prove the alleged risk of damage.¹¹ It may be assumed because of the challenges to provide evidence that such an obligation rests upon states only. If not contended, then traditional environmental laws which recognise states' freedom of exploitation or 'sovereign rights' to exploit their own natural resources anchored their obligation and responsibility to provide evidence.¹² This argument may also be supported by judicial authority. In several decisions of the European Court of Human Rights (ECtHR), the Court ruled that Article 8 ECHR lays down a positive obligation for member states to inform the public about potential environmental risks and, on the basis of a prior risk assessment, to take those measures that are reasonably necessary to prevent serious damage to the environment and the private and family life of citizens.¹³ What is clear is that, as noted, traditional environmental law requires those wanting a change from the status quo should bear the burden of proof. Nevertheless, increasing awareness of the unpredictability, severity, and potential irreversibility of environmental effects caused by human activities has caused a shift of the burden of proof to proponents of potentially harmful

¹¹ Judith Jones and Simon Bronitt, 'The Burden and Standard of Proof in Environmental Regulation: The Precautionary Principle in an Australian Context' in Elizabeth Fisher, Judith Jones and Rene von Schomberg (eds), *Implementing the Precautionary Principle: Perspectives and Prospects* (Edward Elgar, 2006).

¹² Principle 2 Rio (n3).

¹³ *Tătar v Romania* [2009] 67021/10 (ECtHR, 27 January 2009).

activities.¹⁴ Unlike the traditional model, modern environmental laws require those actors intending to carry out environmentally sensitive activities to demonstrate that these activities shall not have a harmful effect.¹⁵

Legal scholars differ on this. Wiener is one who dissents, claiming that such a reversal will change the well-known principle of criminal law ‘innocent until proven guilty’ to ‘guilty until proven innocent’ in an environmental context.¹⁶ Nonetheless, the justification behind the reversal is good enough to support the argument. One justification is the proposition that the party with the best access to the relevant information or knowledge should bear the burden of proof. A second justification is that equity considerations, such as resources and power, should determine which party bears the burden of proof. More than ever before, it is clear that those creating danger by their actions are those who will benefit from these actions. Therefore, they are in the best position to evaluate the pros and cons of the action in connection with the environment, and society has a right to expect them to assume the cost of risk assessment.¹⁷ Nowadays, whether modern environmental laws have caused a shift in the burden of proof from the opponents of an activity or product to the proponents is not as controversial as the principle itself. Because the reversal of the burden of proof has been incorporated explicitly or implicitly in several international environmental treaties and supported in judicial decisions.¹⁸ The reversal of the burden of proof is apparent in the fields of the conservation of nature and pollution control in particular.¹⁹

Article 11(2) of the 1982 World Charter for Nature involves an explicit example of allocation of the burden of proof. It requires a thorough investigation of the potential impact of activities likely to cause irreversible harm to nature before those activities take place. The Charter requires that the proponents of the activities demonstrate that expected benefits outweigh the potential damage to nature and that the activities should be discontinued where potential adverse effects are not fully understood. Likewise, article 4 of the 1988 Convention on the Regulation of

¹⁴ Barney Dickson (n6) 275.

¹⁵ Adriana Fabra (n5) 66.

¹⁶ Jonathan B. Wiener, ‘Precaution’ in Daniel Bodansky, Jutta Brunnee and Ellen Hey (eds), *International Environmental Law*, (OUP, 2007).

¹⁷ Andorno (n7).

¹⁸ Patricia Birnie, Alan Boyle and Catherine Redgwell, *International Law and the Environment* (3rd edn., OUP 2009), 163.

¹⁹ Mehmet Suat Kayıkçı, ‘The Burden of Proof within the Scope of the Precautionary Principle: International and European Perspectives’(2012) *SSRN 2101613*, The Burden of Proof within the Scope of the Precautionary Principle: International and European Perspectives by Mehmet Suat Kayıkci: SSRN accessed 1 September 2024.

Antarctic Mineral Resource Activities (CRAMRA) requires entities intending to engage in mining activities in the Antarctic to conduct a compulsory environmental impact assessment (EIA) for their activities. Thus, eco-mining activities are forbidden until proven as not causing harm to the Antarctic environment or dependent on ecosystems, and not having significant adverse effects to regional climate or weather patterns.

In addition, the reversal of the burden of proof is supported by international judicial decisions. Apart from the International Court of Justice (ICJ),²⁰ Judge Wolfrum of the International Tribunal for the Law of the Sea affirmed in a separate opinion that according to the general agreement, the reversal of the burden of proof regarding harmful activities is a consequence of the precautionary principle.²¹ The controversial character of the burden of proof and its reversal is further illustrated by debates relating to the nature of the activities engaged in, including the unpredictability, severity, and potential irreversibility of environmental effects they may cause, and equity considerations, including resources, power, and development. These conclusions are concrete enough for states, policymakers, courts, and scholars to provide a basis for their decisions. Likewise, there is an econ-centric point of view of the positive trend in the reversal of the burden of proof, its normative character, and its formulation in modern environmental instruments. Thus, the growing trend is toward the affirmation that the use of the principle of precautionary in modern environmental law²² embodies a norm on

²⁰ *Australia v France* (1973) Australia & New Zealand and France before the ICJ regarding nuclear tests (the First Nuclear Test Case, Nuclear Tests (Australia v. France) (icj-cij.org) (accessed 1 September 2024); *Australia and Aotearoa/New Zealand v France* ICJ, 22 June 1973), Nuclear Tests (Australia v. France), Judgment, 20 Dec 1974 (jsumundi.com) (accessed 1 September 2024). Twenty years later, Judge Weeramantry stated: ‘Where a party complains to the Court of possible environmental damage of an irreversible nature which another party is committing or threatening to commit, the proof or disproof of the matter alleged may present difficulty to the claimant as the necessary information may largely be in the hands of the party causing or threatening the damage. The law cannot function in the protection of the environment unless a legal principle is evolved to meet this evidentiary difficulty, and environmental law has responded with what has come to be described as the precautionary principle ...’

²¹ *Ireland v United Kingdom* (2001) MOX Plant Case between Ireland and UK (2001), International Tribunal for the Law of the Sea (ITLOS), The MOX Plant Case, Provisional Measures (itlos.org) (accessed 1 September 2024).

²² P Sands, J Peel, with A Fabra, R MacKenzie, *Principles of International Environmental Law* (CUP, 2018) put it as follows – the precautionary principle is ‘sufficiently well established to provide the basis for an international cause of action; that is to say, to reflect an international customary legal obligation the violation of which would give rise to a

the shift or reversal of the burden of proof, but the same is lacking in determining how and what caused the shift of the burden of proof.

LEGAL EVOLUTION OF THE PRECAUTIONARY PRINCIPLE AND THE REVERSAL OF THE BURDEN OF PROOF

As to the legal evolution of the principle of precautionary as a customary international law principle, the main question to consider is whether the evolution of the principle of precautionary brought a shift in the nature and content of its obligation, or was it a mere ‘cosmetic exercise’, taking part in the same movement towards the pole of obligation. However, before addressing this question, it is helpful to scrutinise the legal evolution of norms under international law. Debates on the legal evolution of international norms generally engage philosophical and methodological perspectives considering the sources, the content, the evidentiary elements, and the value-oriented goals of international norms. Doctrinal views assume that certain norms that affect the interests of the world community as a whole and threaten the peace and security of humankind, shocking the conscience of humanity, are part of *jus cogens* norms. This means that an international norm having or creating a positive capacity or universally accepted and aimed at the preservation of fundamental human rights can be taken as ascended at the level of a *jus cogens* norm. Such views lack a scholarly accepted agreement as several factors need to be considered. These include the methods by which to ascertain the existence of a peremptory norm or to assess its significance, and to determine the elements as well as what might give a norm priority over other competing or conflicting norms or principles of international law.²³ A scholarly agreement must determine not only the principles of legal evolution of a legal norm or how a given norm ascends at the level of *jus cogens* but also, perhaps, to determine the implications and consequences of its application.

Despite the lack of scholarly agreement, the doctrinal outset on the legal evolution of international norms may reasonably explain the evolution of principles related to sustainable development which are not yet recognised or have been

free-standing legal remedy’. See also M Haritz, *An Inconvenient Deliberation: The precautionary principle’s contribution to the uncertainties surrounding climate change policy* (Wolters Kluwer Law& Business, 2011).

²³ J Crawford, *Brownlie’s Principles of Public International Law* (8th edn, OUP, 2012). At the same time, inquiry into the relationship between peremptory norms and the sources and functions of international law has been virtually non-existent. This is indeed surprising, given the recent substantial interest in these areas as part of a larger ‘theoretical explosion’ in international legal studies.

recognised simply as rules of customary international law. This is because they have emerged widely in both national and international legal instruments and are made operational in binding international treaties of an environmental, economic, and social character. The acknowledgment by judicial institutions both at the international and national levels and their acceptance as global objectives²⁴ has also generated rights and obligations, including the obligation to provide evidence on the harmlessness of economic activities,²⁵ thus forming part of international law and policy in the field of sustainable development.²⁶ Likewise, these principles play a significant role in the interpretation and application of international law as they guide the development of laws and policies toward social, environmental, and economic objectives.²⁷ Based on doctrinal views, the trend observed is that principles of sustainable development generate international obligations, for which states may be liable for their breach.²⁸ Thus, because of the international pronouncement supporting these views, principles of sustainable development set out a solid footing for the induction of legal obligations of states for international wrongful acts and serve a useful purpose in claiming reparation under international law.

In search of such a pattern, due regard must be placed on treaties and national legislation as they contribute to the formulation of customs and laying down

²⁴ Declaration on Establishment of the Arctic Council, 35 ILM 1382 (1996), [ottawa_decl_1996-3..pdf](https://arcticportal.org/decl_1996-3.pdf) (arcticportal.org) accessed 1 September 2024); Yaoundé Declaration on the Conservation and Sustainable Management of Forests, 38 ILM 783 (1999); Agreement on Co-operation for the Sustainable Development of Mekong River Basin, 34 ILM 864 (1995); and Revised Protocol on Shared Watercourses in the Southern African Development Community, 40 ILM (2001).

²⁵ M.-C Cordonier Seggar and A Khalfan (eds), *Sustainable Development Law: Principles, practices, and prospects* (OUP, 2004).

²⁶ The New Delhi Declaration of Principles of International Law Relating to Sustainable Development. International Law Association (2002), [New Delhi Declaration | PDF | Sustainability | United Nations Framework Convention On Climate Change](#) (scribd.com) (accessed 12 February 2024).

²⁷ When it comes to customary norms and treaty law related to sustainable development, international law, especially the 1969 Vienna Convention on the Law of Treaties (art 30), helps to resolve overlaps. See P Sands, 'International law and Sustainable Development' in R Revez, P Sands, and R Stewart, *Environmental Law, The Economy, and Sustainable Development* (OUP, 2000) 101.

²⁸ Articles 2 & 31 Draft articles on Responsibility of States for Internationally Wrongful Acts adopted by the International Law Commission at its fifty-third session, Official Records of General Assembly, Fifty-sixth session, Supplement N0 10(A/56/10), Chp IV.E.1.

specific ways of applying existing customs or providing for the application of legal regimes between the parties in case of violation. Thus, the normative character of principles related to sustainable development has generated obligations and rights which state parties must respect and ensure respect.²⁹ Certainly, a feature of a norm of *jus cogens* needs to coincide with the ‘essential’ nature, in general, attaching to peremptory law, since it is a technical notion intended to regulate certain relations among treaties. The character of the norm protecting customary international law entails a different nature and content, and the precautionary principle is not exempted. This is because it cannot be denied that the category of international obligations admitting of no derogation is much broader than the category of international obligations the breach of which is necessarily an international crime.³⁰ It can be argued that the burden of proof features this category of obligation and the new status of the precautionary principle as a customary international law changes the character of the burden of proof.

The core understanding in dealing with these norms is that they aim at reinforcing international legality, particularly through a collective intervention based on the idea of states’ legal interests whenever a serious breach of a peremptory norm of general international law occurs.³¹ In the event of a ‘serious breach’, all states have a recognized legal interest, as members of the international community, in defending legality.³² The important point here is that the obligation has been extended to all parties in the case of aggravated responsibility. That the response to serious breaches of peremptory norms should not be left to the sovereign discretion of states instead of being dealt with collectively, especially a *jus cogens* status and *erga omnes* obligation mean that the obligations arising from these norms are ‘compelling law’ and ‘flowing to all’. Article 53 of the Vienna Convention is applied in the context of a breach of an essential obligation for the

²⁹ *Nicaragua v United Nations* [1986] ICJ Rep14 par 99–101, concerning military and paramilitary activities.

³⁰ Giorgio Gaja, ‘Obligations Erga Omnes, International Crimes and Jus Cogens: A Tentative Analysis of Three Related Concepts’ in JHH Weiler, A Cassese and M Spinedi (eds), *International Crimes of States: A Critical Analysis of the ILC’s Draft Article 19 on State Responsibility* (European University Institute: Series A 10, 1989) 273.

³¹ Eric Wyler, ‘From “State Crime” to Responsibility for “Serious Breaches of Obligations under Peremptory Norms of General International Law”’ (2018) *European Journal of International Law*, vol. 13, no 5, pp 1147–1160.

³² Linos Alexander Sicilianos, ‘The Classification of Obligations and the Multilateral Dimension of the Relations of International Responsibility’, (2002), 13 *EJIL* Issue 5, pp. 1147–1160, Classification of Obligations and the Multilateral Dimension of the Relations of International Responsibility | European Journal of International Law | Oxford Academic (oup.com) (accessed 1 September 2024).

international community and empowered any state to ‘assert the responsibility’ of the actor state.³³ Putting this in the context of the burden of proof, the argument is that it has become a collective responsibility of the international community. It means that all parties must comply with the obligations arising therein and such an obligation constitutes an essential obligation for the protection of the fundamental interests of the international community. The first engaged obligation is the recognition of the highest status of such norms under international law. The second engaged obligation and perhaps more significant is that no derogation is allowed.

EQUITY CONSIDERATIONS - POWER AND RESOURCES AND SCIENTIFIC INNOVATION

The second argument is based on the inability of states due to limited technological, economic, and financial capacity to evaluate the full spectrum of impacts that sensitive ecosystems will face, and thus contribute to the design of measures to sustainably explore these ecosystems. For example, in recent years deep-sea mining has been considered an economically viable and appealing solution to obtain raw materials.³⁴ Although promising, much of these mineral resources are in the vicinity of sensitive ecosystems, and effort is required to compile available studies, given that early studies date back to the 1970s.³⁵ This limited set of data clearly shows that additional approaches are needed to understand the large-scale deep-sea physical oceanographic processes. In this context, the unique development and accessibility of deep-sea ecosystems will critically require the integrated development of technological solutions, particularly underwater navigation, including new robotic technologies and solutions, novel radio wireless communications enabling high bandwidth and real-time underwater communications, and underwater wireless power transfer. These technological developments are vital to validate the responsible and sustainable exploitation of deep-sea mineral resources, based on the precautionary principle.

³³ Wyler (n31).

³⁴ E Ramirez-Llodra, *et al.*, ‘Man, and the last great wilderness: human impact on the deep sea’ (2011) *PLoS One* 6 (8), e22588, Man and the Last Great Wilderness: Human Impact on the Deep Sea | PLOS ONE (accessed 1 September 2024).

³⁵ Santos M.M. *et al.*, ‘The last frontier: Coupling technological developments with scientific challenges to improve hazard assessment of deep-sea mining’(2018) *Science of the Total Environment* 627 pp 1505–1514.

According to Article 4 of the Convention on the Regulation of Antarctic Mineral Resource Activities (adopted in June 1988),³⁶ entities intending to engage in mining activities in the Antarctic were obliged to conduct a compulsory environmental impact assessment (EIA) for their activities. Such activities were outlawed until it was proven with the results of EIA that they would not cause harm to the Antarctic environment or dependent and associated ecosystems and have significant adverse effects on regional climate or weather patterns. The state's inability or lack of resources to carry out these processes requires the state to rely on the developer of the technologies. What is clear here is the swiftness of the evidentiary obligation which traditionally rests upon the state to or not issue an environmental certificate only after an assessment or having ascertained that activities undertaken within its jurisdiction are or not harmful to the environment. New environmental policies also tend to rely on the developer of economic and development activities to take responsibility and ensure the environmental sustainability of their projects. For example, the EU Directives on the promotion of the use of energy from renewable sources require producers to provide evidence of the environmental sustainability of their activities.³⁷ As stated above, the rationale behind this approach is that those who create danger with their actions are the ones in the best position to evaluate the pros and cons of the action in connection with the environment. As a result, society has a right to expect them to assume the cost of risk assessment. There are claims that the reversal of the burden of proof does not impede rather it fosters scientific innovation.³⁸ This can be considered in the context of the requirement to subject some products to a pre-market screening for their harmlessness. In the processes, the producers of certain products are asked to show enough evidence that their products would not cause harm so that the products can be licensed. Unlike the previous claims, the core understanding of scientific innovation is that states 'have agreed an activity will be impermissible unless it can be shown that it will not cause harm to the environment'.³⁹

³⁶ Convention on the Regulation of Antarctic Mineral Resource Activities | New Zealand Ministry of Foreign Affairs and Trade (mfat.govt.nz) (accessed 1 September 2024).

³⁷ Renewable Energy Directive (europa.eu) (accessed 1 September 2024).

³⁸ Dayna Nadine Scott, 'Shifting the BOP: The Precautionary Principle and its Potential for the Democratization of Risk' in Law Commission of Canada (ed.) *Law & Risk* (UBC Press and Les Presses de L'Université Laval, 2005) 50.

³⁹ Patricia Birnie, Alan Boyle and Catherine Redgwell, *International Law and the Environment* (3rd edn, OUP, 2009), 163.

CONCLUSION

Whether a legal or a moral concept, at the most general level the precautionary principle emphasises that states or people, when undertaking or taking decisions on activities that may have adverse impacts on the environment or human health, have an obligation to act carefully and with foresight. Such an obligation has become part of customary international law obligations. This generates debate about the reversal of the burden of proof in modern environmental law and what issues underlie or arise in that debate. One is the recent expansion of the precautionary principle as a customary international norm. The deliberation in question is thus even more complex now than before, giving rise to considerations of human health, natural resources, and environmental safety, the legal evolution, and scientific innovations which have created a pressing need for ‘true ethic for the future’. Thus, a need for greater precision in dealing with issues such as the allocation of the burden or onus of proof.

What seems to support the rationale for a reverse onus of the burden of proof is the content and nature of the legal obligation and scientific innovation (the development of new technologies). Generally, because of resources, access to information, and corporate or state power, arguably the burden should lie on the party seeking to engage in development destined to impact on the environment rather than the party seeking to stop the development to protect the environment from harm. This trend seems to be born out of the wide spectrum of potential uncertainties from the legal status of the precautionary principle to financial constraints and new technologies, as many simply do not have an insight into whether “something” might be harmful or not. Since one should remain on the safe side, the burden of proof is assigned accordingly to the (scientist) knowledge deviating from the null hypothesis. That is the hypothesis that whoever says there is no harm must demonstrate such harmlessness and provide a guarantee of safety throughout the activity. This means that a reverse onus may be more likely than not to satisfy the obligation of the state or private enterprise engaged in development to prove harmlessness – that is, to bear the burden of proof.

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