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Proving Environmental Harm in Inter-State Litigation: Challenges and Evolving Strategies

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Abstract

The purpose of the work is to systematize the discipline of the proof of environmental harm in inter-State litigation, examining, in light of the practice of international courts and tribunals, the following five aspects: (i) definition of the actionable 'environmental damage'; (ii) burden of proof and presentation of evidence; (iii) means and methods of proof; (iv) standard of proof; and (v) evaluation of the damage. The analysis takes into account the most relevant case law and doctrinal studies in the field, reconstructing a general framework, whilst taking into account specificities that might derive from specific applicable regimes. The main aim of the work is to assess whether the challenges in proving environmental harm are fostering – or have already led to – the creation of a different set of applicable rules on evidence.

Keywords

environmental harm – inter-State litigation – evidence – international courts and tribunals – expert evidence – transboundary environmental damage

1 Introduction

When litigating an environmental dispute at the inter-State level, a critical issue to address is that of proving the environmental damage. Indeed, an international court may be called upon to intervene in environmental disputes

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when there are activities under the jurisdiction of a State that endanger the environment or pose a threat to natural resources situated in another State. Usually, litigation concerns the responsibility of a State for the failure to prevent and/or for the causation of environmental damages.

Although States have generally expressed a preference for alternative environmental dispute settlement mechanisms,[1] including non-compliance mechanisms provided for in most recent multilateral environmental treaties, an increase in the number of claims brought before international courts or tribunals ("ICTs") can be noted, so much so that, as early as in 1993, the International Court of Justice ("ICJ") created a Chamber for Environmental Matters under the procedure of Article 26 of its Statute.[2]

The present work aims at systematizing the discipline of the evidence of environmental harm in inter-State litigation, inquiring over the following five aspects: (i) definition of the actionable environmental damage; (ii) burden of proof and presentation of evidence; (iii) means and methods of proof; (iv) evaluation and standard of proof; and (v) assessment of the damage. Analyzing the difference in points of evidence between the practice of ICTs in dealing with environmental harm cases and other general matters, conclusions will be drawn on whether such claims, for being characterized by an abundance of facts to be proven and the massive introduction of scientific data and expert evidence, require and apply different standards than other categories of claims. As a point of reference, the work analyzes the discipline of evidence in the light of the general international legal regime that governs the responsibility of States for wrongful acts, insofar as the obligation to prevent transboundary harm requires – as it will be shown – actual harm.

First of all, it is necessary to define the scope of the work. Litigation on environmental matters refers to the approach traditionally elaborated by Bilder, encompassing all claims that refer to "the alteration, through human intervention, of natural environmental systems", and therefore issues of air, land and sea pollution; climate change; the conservation of natural resources, biodiversity, various ecosystems, and, in general, of natural heritage.[3] The

1 See TREVES et al. (eds.), *Non-compliance Procedures and Mechanisms and the Effectiveness of International Environmental Agreements*, Den Haag, 2009.

2 CHARTIER, "Chamber for Environmental Matters: International Court of Justice (ICJ)" in RUIZ FABRI (ed.), *Max Planck Encyclopedia of International Procedural Law*, Oxford, 2018. The Chamber was dissolved in 2006 due to the lack of applications before it.

3 CILDER, "The Settlement of Disputes in the Field of International Law of the Environment", RCADI, 1975, Vol. 144, p. 140 ff., p. 153. See also, *ex multis*: SANDS, "Litigating Environmental Disputes: Courts, Tribunals and the Progressive Development of International Environmental Law", in NDIAYE and WOLFRUM (eds.), *Law of the Sea, Environmental Law and Settlement of Disputes*, Den Haag, 2007, p. 313 ff.; BIRNIE, BOYLE and REDGWELL, *International Law and the Environment*, 3rd ed., Oxford, 2009, pp. 1–6.

present analysis will thus have particular regard to the procedural rules and jurisprudence of the ICJ, the International Tribunal for the Law of the Sea ("ITLOS") and the dispute settlement bodies of the World Trade Organization ("WTO"). The analysis is thus limited to such bodies that share a similar *rationae personae* and *materiae* jurisdiction and have settled environmental disputes in the past decades. Occasionally, specific references to arbitral awards of relevance are presented.

2 What is Environmental Damage?

Before proceeding with the analysis of elements of proof, environmental damage actionable before ICTs has to be defined. Taking the example of an air pollution case, to successfully litigate a case, the actor will first have to prove that the pollution has occurred and, secondly, that the defendant is to be held liable for it.

Since 1949 with the affirmation in *Corfu Channel* of the principle "every State has an obligation not to knowingly allow its territory to be used for acts contrary to the rights of other States", the ICJ has been seized with claims involving transboundary liability issues.[4] The principle, which has its roots in Roman law, had already been affirmed in the *Trail Smelter* arbitration, when the United States were compensated for damages caused by a Canadian smelter. The tribunal held that:

> [N]o State has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another or the properties or persons therein, when the case is of serious consequence and the injury is established by clear and convincing evidence.[5]

The ICJ went on to clarify in *Legality of Nuclear Weapons* that a "general obligation of States to ensure that activities within their jurisdiction and control respect the environment of other States or areas beyond national

4 *Corfu Channel* (*United Kingdom v. Albania*), Merits, Judgment of 9 April 1949, ICJ Reports, 1949, p. 4 ff., p. 22.

5 *Trail Smelter Arbitral Tribunal* (*United States of America v. Canada*), Decision of 11 March 1941, in *American Journal of International Law*, 1941, p. 684 ff., p. 716 (emphasis added). The principle, applied here for the first time in environmental matters, has its basis in the *Alabama Claims Arbitration* of 1872, where it was more generically stated that a State owes at all times a duty to protect other States against injurious acts by individuals from within its jurisdiction.

control" exists and that therefore it follows that "a general obligation to protect the natural environment against widespread, long-term and severe environmental damage".[6]

Limiting the present analysis to what appears useful in dealing with the proof of environmental damage, it can be said that there are four cases in which a State may incur in liability, namely: (i) for having caused transboundary environmental damage; (ii) when it has failed to cooperate in the mitigation of transboundary environmental damage; (iii) when it has failed to comply with the *due diligence* standards required by international law or for the risk of environmental damage resulting from its failure to regulate and/or control hazardous activities, even if such activities are not prohibited; and (iv) when it has violated any treaty provision concerning the protection of the environment.[7] As to the manifestation of the damage, it may be direct (suffered directly by the State as a legal entity) or indirect (affecting natural or legal persons enjoying the diplomatic protection of a certain State); physical, economic or immaterial.

The fundamental issue is to understand when the responsibility arises, since the conduct and the occurrence of the damage or the interference tend to be situated in two distinct – and sometimes distant – temporal moments, with all the consequences in terms of evidence that it entails.

ICTs have decided to limit their jurisdiction, specifying that the actionable damage is only that which is *actual* and reaches the threshold of *significant*. Minimal effects, including environmental interferences, are considered irrelevant.[8]

In *Certain Activities,* the ICJ had been requested by Nicaragua to decide whether the increasing concentration of sediment in the San Juan River following the construction of a road by Costa Rica had created harm to certain species of fish, macro-invertebrates, and families of algae.[9] The Court

6 *Legality of the Threat or Use of Nuclear weapons*, Advisory Opinion of 8 July 1996, ICJ Reports, 1996, p. 225 ff., paras. 29, 31.

7 BIRNIE, BOYLE and REDGWELL *cit. supra* note 3, p. 137. See also International Law Commission, *Draft articles on Prevention of Transboundary Harm from Hazardous Activities, with commentaries*, 2001, pp. 43–365; on the concept of international wrongdoing, see International Law Commission, *Responsibility of States for Internationally Wrongful Acts, with commentaries*, 2001, pp. 31–143.

8 LEFEBER, "Responsibility not to Cause Transboundary Environmental Harm", in KRÄMER and ORLANDO (eds.), *Elgar Encyclopedia of Environmental Law*, Vol. 6, Rotterdam, 2018, p. 92 ff., p. 97.

9 *Certain Activities Carried Out by Nicaragua in the Border Area* (*Costa Rica v. Nicaragua*) *and Construction of a Road in Costa Rica along the San Juan River* (*Nicaragua v. Costa Rica*), Merits, Judgment of 16 December 2015, ICJ Reports, 2015, p. 665 ff.

concluded that there was insufficient evidence to show it had created "real and significant harm" to the ecosystem, noticing that Nicaragua had not presented "any evidence of *actual* harm" and had not indicated "with precision which species of fish have allegedly been harmed".[10] This principle had already been previously crystallized by the ICJ in *Pulp Mills*, where the Court established in general terms that a State is "obliged to use all the means at its disposal in order to avoid activities which take place in its territory, or in any area under its jurisdiction, causing *significant* damage to the environment of another State".[11]

What is to be considered *significant* was authoritatively clarified by the International Law Commission ("ILC") in the Draft Articles on the prevention of transboundary harm, that specified that the it entails harm "more than '*detectable*'", but that further qualifications of "seriousness" or "substantiality" are not necessary.[12] The ILC had also specified that the harm must result in a "real detrimental effect on matters such as [...] human health, industry, property, environment or agriculture" in the territory of another State that must be measurable by factual and objective standards.[13] If the standards are provided for in the applicable law, it will rest on the competent authority to decide in accordance. For example, Argentina and Uruguay had established through a treaty a Commission which in a delegated act had set certain general limitations on the emissions of hydrocarbons, sediments, oils and fats that could be released into the Uruguay River and that, after prior notification and consultations with the other party, private companies would be granted authorizations to operate.[14] Taking into consideration the data presented by the parties, the ICJ in *Pulp Mills*, tasked to decide over claims of environmental harm caused by an Uruguayan mill, concluded that the emissions had not exceeded the established limit and that therefore there was no responsibility of Uruguay.[15]

Proving the existence of significant harm is not sufficient as it is necessary to demonstrate the existence of a causal nexus between the wrongful act and the injury suffered.[16] This general principle relates to the element of causality,

10 *Ibid.*, paras. 211–213 (emphasis added).

11 *Pulp Mills on the River Uruguay* (*Argentina v. Uruguay*), Merits, Judgment of 20 April 2010, ICJ Reports, 2010, p. 14 ff., para. 101 (emphasis added).

12 Draft articles on Prevention of Transboundary Harm from Hazardous Activities, with commentaries, commentary on Art. 4.

13 *Ibid.*

14 See for all the details: Treaty concerning the boundary constituted by the River Uruguay, Montevideo on 7 April 1961.

15 See *Pulp Mills on the River Uruguay* case, *cit. supra* note 11.

16 *Ahmadou Sadio Diallo* (*Republic of Guinea v. Democratic Republic of the Congo*), Compensation, Judgment of 19 June 2012, ICJ Reports, 2012, p. 324 ff., para. 14.

which is the means by which to ascertain the link between the occurrence of an event relevant to the legal system and a State.[17] What characteristics it should have, however, is more difficult to determine. Coherently with the ILC position, the ICJ has specified that "it may vary depending on the primary rule violated and the nature and extent of the injury".[18] In some cases, which – for the author – include environmental matters, the Court ruled that a "sufficiently direct and certain casual nexus" was required.[19] This is closely related to the concept of "proximate cause", which aims to avoid liability for damages that were only indirectly caused by the conduct of the defendant or for events temporally situated particularly prior to the occurrence of the damage.[20] Moreover, issues may arise with respect to the existence of damage and causation in light of the fact that environmental damage generally has multiple origins and "the state of science regarding the causal link between the wrongful act and the damage may be uncertain", leaving to the Court the ultimate analysis over the evidence presented.[21]

Against this backdrop, the various phases of the life of evidence are examined in order to understand if environmental matters, for their specificities, require the application of a different set of rules.

3 Burden of Proof and Presentation of the Evidence

The allocation of the burden of proof is a procedural issue of primary importance as it indicates which party should present to the Court the elements necessary to support a given statement over the facts and, thus, the relevant rule and its applicability to the concrete case.[22] The systematic function of the

17 See OLLINO and PUMA, "La causalità e il suo ruolo nella determinazione dell'illecito internazionale", *Rivista di Diritto Internazionale*, 2022, p. 313 ff., p. 314.

18 *Armed Activities on the Territory of the Congo* (*Democratic Republic of the Congo v. Uganda*), Reparations, Judgment of 9 February 2022, para. 93. For further references see OLLINO and PUMA, *cit. supra* note 17.

19 See *Armed Activities on the Territory of the Congo* case, cit. *supra note* 18, para. 32 and *Ahmadou Sadio Diallo* case, *cit. supra* note 16, para. 14. See also *infra*, para. 5.

20 PARKHOMENKO et al., "Proving Environmental Harm before International Courts and Tribunals", in SOBENES et al. (eds.), *The Environment Through the Lens of International Courts and Tribunals*, Den Haag, 2022, p. 483 ff., p. 494.

21 See *Armed Activities on the Territory of the Congo* case, cit. *supra note* 18, para. 34.

22 ROSENNE, *The Law and Practice of the International Court 1920–2005*, 4th ed., Den Haag, 2006, p. 1040. See also, *ex multis*, KAZAZI, *Burden of Proof and Related Issues: A Study on Evidence before International Tribunals*, Den Haag, 1996 and BROWN, *A Common Law of International Adjudication*, Oxford, 2007, p. 92.

evidentiary burden lies in the need to inform the parties in advance of their respective duties to present all those elements necessary for the court to reach an informed decision.[23]

ICTs have mostly employed the general principle *actori incumbit probatio*, according to which it is incumbent on the applicant to enclose to its application all the elements of proof that support its position. Therefore, the failure to present them or their insufficiency, will lead the adjudicating body to reject the claim.[24] The principle is a well-established principle of national law, being present in almost the totality of nation systems, and, as such, a source of international law in accordance with article 38 of the ICJ Statute.[25] Applying the equality of arms principle, the *actori incumbit probatio* is also extended to one who presents an exception, a defense, or when there are opposing claims.[26] In international case law, the clearest formulation of the burden of proof can be found in *Nicaragua v. United States,* with the Court specifying that ultimately "it is the litigant seeking to establish a fact who bears the burden of proving it; and in cases where evidence may not be forthcoming, a submission may in the judgment be rejected as unproved".[27]

Generally speaking, the ICJ – and other international tribunals on the same line – have developed a pragmatic and effective approach to the problems correlated with the burden of proof, avoiding the mere reliance on the traditional dichotomy applicant/respondent but considering the substantial status of the parties on the specific issue at stake.[28] Although the ICJ has been consistent in the application of the above reconstructed principles, difficulties may arise, leading in certain cases to outcomes that can be considered at odds

23 THAYER, *A Preliminary Treatise on Evidence at the Common Law*, Boston, 1898, pp. 354, 364.

24 FOSTER, "Burden of Proof in International Courts and Tribunals", *Australian Yearbook of International Law*, 2008, p. 27 ff, p. 28. See also: LE MOLI, VISHVANATHAN and AERI, "Whither the Proof? The Progressive Reversal of the Burden of Proof in Environmental Cases before International Courts and Tribunals", *Journal of International Dispute Settlement*, 2017, p. 644 ff., 646.

25 On this, see RIDDEL and PLANT, *Evidence before the International Court of Justice*, London, 2009, p. 87; KAZAZI, *cit. supra* note 22, p. 222.

26 In numerous cases, the PCIJ and the ICJ have crystallized its applicability. See, *ex multis*: *Case Concerning the Temple of Preah Vihear* (*Cambodia v Thailand*), Merits, Judgment of 15 June 1962, ICJ Reports, 1962, p. 6 ff., p. 16.

27 *Military and Paramilitary Activities in und against Nicaragua* (*Nicaragua v. United States of America*), Merits, Judgment of 27 June 1986, ICJ Reports, 1986, p. 14 ff., para. 101.

28 See, *ex multis*, *Case concerning rights of Nationals of the United States of America* (*France v. USA*), Judgment of 27 August 1952, ICJ Reports, 1952, p. 176 ff., paras. 200–202 and 212–213.. For a detailed analysis see RIDDEL and PLANT, *cit. supra* note 25, p. 89 ff.

with the idea of justice.[29] Other courts, although fundamentally referring to the principle of *onus probandi incumbit actori* as a general rule, have developed different parameters in particular circumstances. For instance, the concept of the existence of the *prima facie* case was elaborated in the Appellate Body of the WTO since *US-Shirts and Blouses*, requiring that "the initial burden lies on the complaining party, which must establish a *prima facie* case", before shifting "to the defending party, which must in turn counter or refute the claimed inconsistency".[30]

To conclude, the principle of *onus probandi incumbit actori* remains the general rule but it is possible that the circumstances of the case or the provisions of the applicable law allow for a different allocation of the burden of proof based on specific liability regimes.

As in environmental matters the precautionary principle generally applies, it is necessary to examine whether and how it may alter the burden of proof. Indeed, it would be legitimate to expect that in cases where the precautionary principle is applied, the burden of proof would be reversed on the party performing the dangerous activity that would therefore have to prove that it took all the necessary precautions to avoid the materialization of the damage.[31] In *Pulp Mills,* Argentina argued that in light of the inclusion of the precautionary approach in the 1975 Statute on the River of Uruguay, "the burden of proof will be placed on Uruguay for it to establish that the [...] mill will not cause significant damage to the environment". If such an interpretation was to be rejected, it added that "the burden of proof should not be placed on Argentina alone [...] because [...] the 1975 Statute imposes an equal *onus* to persuade – for the one that the plant is harmless and for the other that it is harmful".[32] The Court rejected such an approach, arguing in general that "while a precautionary approach may be relevant in the interpretation and application of the provisions of the Statute, it does not follow that it operates as a reversal of the burden of proof".[33] The Court also addressed the question of

29 For instance, *Oil Platforms* (*Islamic Republic of Iran v. United States of America*), Merits, Judgment of 6 November 2003, ICJ Reports, 2003, p. 161 ff., Separate Opinion of Judge Owada, para. 57. On the issue see also: LAUTERPACHT, *The development of International Law by the International Court,* New York, 1958, p. 360 ff.; RIDDEL and PLANT, *cit. supra* note 25, p. 87 ff.

30 *European Communities – Measures Concerning Meat and Meat Products* (*Hormones*), Appellate Body Report, 16 January 1998, paras. 97–109.

31 On this line see for example SANDS and PEEL, *Principles of International Environmental Law*, Cambridge, 2018, p. 233 ff.

32 See *Pulp Mills on the River Uruguay* case, *cit. supra* note 11, para. 160.

33 *Ibid.*, para. 164.

whether indeed the Statute, as an applicable *lex specialis*, contained a reversal of the burden of proof exception, but concluded in the negative.[34]

The same approach was upheld in EC – *Beef Hormones*, where the appellate body had to consider whether the applicable treaty could lead to a reversal of the burden of proof, concluding that no such exception existed and that in any case, as a general rule, the precautionary principle, although applicable to the case, does not entail such a reversal.[35] However, environmental treaties that contain an express reversal of the burden of proof exist, including– by way of example – the 1972 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter and the 1992 OSPAR Convention.[36]

From the analysis, it clearly follows that, in the absence of an express exception, the precautionary principle does not entail any reversal of the burden of proof. The ICJ specified, however, that this does not mean that the defendant "should not cooperate in the provision of such evidence as may be in its possession that could assist the Court in resolving the dispute submitted to it".[37] As pointed out by Graziani, this statement is intended to supplement and re-balance the *onus probandi* rule whenever there are possible unreasonable consequences.[38]

4 Admissibility and Means and Methods of Proof

Moving to the substance of the evidence, a State may prove its claim through the use of different means and methods of proof. Article 43 of the ICJ Statute divides the trial into a written and an oral phase, specifying that in the first, together with pleadings, the parties may file papers and documents in support of their arguments, while in the second witnesses and experts may be heard.[39] The ITLOS Rules of Procedure, modeled on the practice of the ICJ, also divide the evidence into written and oral (the latter including both testimony and experts).[40]

34 *Ibid.*
35 See *European Communities – Measures Concerning Meat and Meat Products* (*Hormones*), *cit. supra* note 30, para. 124.
36 For more information see PARKHOMENKO et al., *cit. supra* note 20.
37 See *Pulp Mills on the River Uruguay* case, *cit. supra* note 11, para. 164.
38 GRAZIANI, *Giudice e amministrazione della prova nel contenzioso internazionale*, Napoli, 2020, p. 208.
39 ICJ Statute, Art. 43.
40 ITLOS Rules of Procedure, Art. 44.

In accordance with the general practice of ICTs, there is no formal rule restricting the types of evidence presented by the parties, that should automatically be admitted. Moreover, the court should not be limited in its assessment by the submissions of the parties, as it may also investigate and gather evidence of its own, if of relevance.[41]

In addition, it must be borne in mind that there is no pre-established hierarchy of means of proof and therefore the judge has the exclusive power to appreciate in a discretionary manner the effectiveness of each investigative element and is free to choose from the various sources of evidence the one that, on the basis of free conviction implemented through a reasoned critical judgment, seems the most convincing.[42]

Moving to environmental matters, it is immediately evident that the topic involves heavy fact-finding and highly technical expertise. Issues of documentary evidence and evidence obtained through the use of expert witnesses are therefore hereby discussed.

4.1 *Documentary Evidence*

Documentary evidence is undoubtedly the main category of evidence presented before ICTs and in the light of the new ICJ guidelines and the ITLOS RoP, may be presented by the parties in the form they deem most appropriate, i.e. by means of typed documents, maps, PowerPoint presentations, computer media, photographs, tables or diagrams.[43]

Although the evidentiary value of individual elements is assessed on a case-by-case basis, it is nevertheless possible to draw some general guidelines. First of all, evidence will certainly carry particular weight if it constitutes admissions against one's own interest, including documents, declarations or court orders acknowledging facts unfavorable to the State from which they emanate. In *South China Sea*, the Tribunal in reaching the conclusion that Chinese vessels were involved in fishing endangered species and had used dynamite and cyanide in disputed areas of the South China Sea, relied mostly on reports of naval and coastal authorities and diplomatic notes, disregarding all those incidents involving vessels whose origin was uncertain and not supported by official reports, photographs or inventories carrying certain dating.[44]

41 ICJ Rules of Procedure, Art. 62(1); *Nuclear Tests Case* (*Australia v. France*), Judgment of 20 December 1974, ICJ Reports, 1974, p. 253 ff., p. 257.

42 GRAZIANI, *cit. supra* note 38, p. 281.

43 ICJ Guidelines for the Parties on the Organization of Hearings by Videolink, Art. 13.

44 *South China Sea Arbitration* (*Philippines v. China*), Arbitral Award of 12 July 2016, PCA Case No 2013–19, paras. 950 and 968–969.

Material from international organizations or NGOs that has been collected in the context of fact-finding missions carried out in compliance with the principles of neutrality, impartiality and independence are generally highly regarded means of proof. For instance, in *Pulp Mills* the ICJ had considered the reports and the environmental impact assessment of the *International Financial Corporation* annexed by Uruguay as particularly useful.[45] Maps, photographs, satellite images or other visual material may be of particular importance, provided that their dating is certain.[46] Any other element of uncertain origins or reliability does not possess probative value *per se*, but may contribute to the formation of the judge's conviction.[47]

4.2 *Expert and Scientific Evidence*

If in the vast majority of cases, the preponderance of evidence is presented in a documentary form, in environmental matters courts have to decide on technical and scientific issues that, to an untrained ear, may be convincingly argued in a competing manner. It is therefore necessary to involve experts who can help the bench to establish the relevant facts, assess them and their implications.[48]

Experts tend to intervene in support of the party that appoints them and either deposit an affidavit with their opinions or testify at hearings. Articles 57 and 64 of the ICJ Rules briefly regulate the collection of expert evidence. In particular, Rule 64, in indicating a different wording of the statement to be presented at the hearing by the witness and the expert, draws a differentiation between the two roles, implicitly attributing a higher evidentiary value to the expert's words.

The examination of an expert witness follows the tripartite system of examination-in-chief, cross-examination, and re-examination; a new cross-examination is only possible if new evidence has been presented.[49] Judges have the power to put questions and have the opportunity of appointing

45 See *Pulp Mills on the River Uruguay* case, *cit. supra* note 11, para. 226.

46 See *Certain Activities Carried Out by Nicaragua in the Border Area* and *Construction of a Road in Costa Rica along the San Juan River* cases, *cit. supra* note 9, paras. 202–206.

47 An example in this respect is the aforementioned *South China Sea* arbitration, in which newspaper articles and investigations by the BBC and the New York Times were used to substantiate and corroborate other evidence (see *South China Sea Arbitration* case, *cit. supra* note 44, paras. 848 and 968).

48 PARKHOMENKO et al., *cit. supra* note 20, p. 503.

49 WOLFRUM, *Taking and Assessing Evidence in International Adjudication*, in NDIAYE and WOLFRUM (eds.), *Law of the Sea, Environmental Law and the Settlement of Disputes*, Brill, 2007, p. 351.

ex curia experts as well.[50] UNCLOS provides that, *motu proprio* or at the request of one of the parties, and after consultation with them, the court or tribunal may appoint no less than two experts to sit with them but without the right to vote.[51] Outside the application of Article 289, in any case, after hearing the parties, the Court has the right to appoint experts. Moreover, ITLOS has developed a *voir dire* practice, consisting of a preliminary examination of the experts in order to assess their competence.

In the WTO context, the only provision allowing the involvement of experts is Article 13 of the DSU, which contains a general provision on the possibility for panels to obtain information from persons with expertise, leaving a very wide discretion to panels. In the SPS, it is specified in Article 13 that in disputes "involving scientific or technical issues, a panel should seek advice from experts chosen by the panel in consultation with the parties". In *EC – Hormones*, for instance, the parties were allowed to comment on who should be appointed by the Panel, nominate party experts and be consulted in the preparation of the questions.[52] ITLOS, in *Land Claims,* had envisaged a *sui generis* and hybrid approach in using experts through the creation of a panel of experts; similarly the *Iron Rhine Railway* arbitration tribunal ruled that such "issues are appropriately left to technical experts".[53] Others, first and foremost the ICJ, however, have been in the past reluctant in nominating *ex curiae* experts.[54]

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50 For further references see, *ex multis*: RAGNI, *Science, Law and International Justice*, Milano, 2020, p. 153; DEVANEY, *Fact-Finding before the International Court of Justice*, Cambridge, 2016, p. 78 ff; FOSTER, "New Cloths for the Emperor? Consultations of Experts by the International Court of Justice", *Journal of International Dispute Settlement*, 2013, p. 139 ff.; ZIMMERMANN et al. (eds.), *The Statute of the International Court of Justice: A Commentary*, 2nd ed., Oxford, 2012.

51 Of particular interest are the PCA Optional Rules for Arbitration of Disputes Related to Natural Resources and the Environment, which provide that the appointment of experts must take place following consultations with the parties (Art. 27(1)) and provide that the experts present their opinions by way of reports and/or be heard at hearing (Art. 27(3)-(4)). For further information see: MELILLO, "Forms of Evidence", in RUIZ FABRI (ed.), *Max Planck Encyclopedia of International Procedural Law*, Oxford, 2021, paras. 17–30.

52 See *European Communities – Measures Concerning Meat and Meat Products* (*Hormones*), *cit. supra* note 29, para. VI.3.

53 *Land Reclamation by Singapore in and around the Straits of Johor* (*Malaysia v. Singapore*), Provisional Measures, Order of 8 October 2003, ITLOS Report 2003, p. 10 ff., para. 76; *Iron Rhine Railway* (*Belgium/Netherlands*), Award of the Arbitral Tribunal of 24 May 2005, para. 235.

54 For a detailed analysis see: ROMANIN JACUR, "Remarks on the Role of Ex Curia Scientific Experts in International Environmental Disputes", in BOSCHIERO et al. (eds.), *International Courts and the Development of International Law*, Den Haag, 2013, p. 441 ss., p. 450.

Looking chronologically at the case law of the ICJ, it can be affirmed that the Court is trying to "get it right", fixing distortions that had appeared in early cases. In both *Gabćikovo-Nagymaros* and *Pulp Mills* some experts had acted as counsel for the parties at the hearings, avoiding in this way counter-examination. The ICJ strongly criticized this approach, pointing out that those who provide evidence before the Court based on their scientific or technical knowledge should testify before the Court as experts, rather than counsel, so that they may be submitted to questioning by the other party as well as by the Court.[55]

Precisely to remedy the problems that had previously arisen, in *Whaling in the Antarctic* the parties' experts were questioned and cross-examined by counsels according to procedures and modalities timely defined by the President.[56] In *Certain Activities,* the Court provided even more detailed instructions, recommending, for example, that the parties provided guidance as to how the experts should be examined and that the authors of the reports should be called as expert witnesses so that the opponent could proceed to cross-examination.[57] At last, in *Silala*, the Court clearly relies on experts' opinions in the reconstruction of the pertinent facts.[58]

However, the relationship between science and the ICJ has always been a contentious one and the reluctance can be traced back to the judges' fear of somehow losing control over the judgment, especially through the appointment of *ex curiae* experts.[59] Judge Yusuf addressed the topic in *Pulp Mills*, stating however that "it is not for the expert to weigh the probative value of the facts, but to elucidate them and to clarify the scientific validity of the methods used to establish certain facts or to collect data".[60] Moreover, the Court should not rely on the presentation of the facts elaborated by the experts in "a wholesale manner", but it should in a first phase identify the "areas in

55 See *Pulp Mills on the River Uruguay* case, *cit. supra* note 11, para. 167. See also Separate Opinion of Judge Greenwood, para. 27.

56 *Whaling in the Antarctic* (*Australia v. Japan: New Zealand Intervening*), Pleadings, CR 2013/7, 27 June 2013, p. 38.

57 *Certain Activities Carried Out by Nicaragua in the Border Area* (*Costa Rica v. Nicaragua*) *and Construction of a Road in Costa Rica along the San Juan River* (*Nicaragua v. Costa Rica*), Pleadings, Oral Arguments, CR 2015/9, 20 April 2015, para. 30. For an in-depth analysis see: RAGNI, *cit. supra* note 50, p. 170.

58 *Dispute over the Status and Use of the Waters of the Silala* (*Chile v. Bolivia*), Merits, 1 December 2022, paras. 15–20; 53 and 94.

59 FOSTER, *Science and the Precautionary Principle in International Courts and Tribunals*, Cambridge, 2011, p. 136; RIDDEL and PLANT, *Evidence before the International Court of Justice*, London, 2009, p. 353.

60 See *Pulp Mills on the River Uruguay* case, *cit. supra* note 11, Statement of Judge Yusuf, para. 10.

which further fact-finding or elucidation of facts is necessary" and later, on that specific issues, "resorting to the assistance of experts".[61] In the same case, in their dissenting opinion, Judges Al-Khasawneh and Simma, clearly contested the methodology employed by the Court, stressing the need to nominate and entrust experts on point of facts, as in fact-intensive disputes the insights to make sound legal decisions necessarily emanate from experts consulted by the Court.[62]

These fears are thus to be considered unfounded, since the ascertainment of the scientific fact, which cannot disregard the intervention of experts in almost all cases, always remains subordinate to the judge's control over the method, a judge who will ultimately always be competent to establish whether the scientifically ascertained facts meet the requirements for the application of the rule of law.

Different and varying approaches therefore can be witnessed in different jurisdictions, and in fact-intensive and highly technical fields – including environmental disputes – innovative and more detailed guidelines are to be looked upon with particular favor, in a view of fostering the independence and impartiality of the expert and, as a consequence, permit the courts to reach a more informed decision.

5 Evaluation of the Evidence and Standard of Proof

The general lack of formalized procedural rules on the admission and evaluation of evidence allows the courts to operate with greater flexibility, and thus to adapt more easily to the needs of the particular case. Nonetheless, it risks creating a certain unevenness in the proceedings.[63] An international court thus freely considers all the evidence before it, assesses its admissibility, its relevance, credibility and weights the single elements to form its conviction.[64]

The reluctance to offer more guidance as to the strength to be attributed to individual pieces of evidence has been widely criticized in doctrine, which has deemed the court's freedom to be "arbitraire en raison de l'absence d'une

61 *Ibid.*

62 See *Pulp Mills on the River Uruguay* case, *cit. supra* note 11, Dissenting opinion of Judges Al-Khasawneh and Simma, para. 12.

63 On this point see: WOLFRUM and MOLDNER, "International Courts and Tribunals", in RUIZ FABRI (ed.), *Max Planck Encyclopedia of International Procedural Law*, Oxford, 2013.

64 PARKHOMENKO et al., *cit. supra* note 20, p. 498.

méthode d'évaluation précise et de motivation des choix",[65] or has held that "its assessment of evidence is incoherent, inconsistent, arbitrary and capricious".[66] At times, criticism was also raised by members of the adjudicative panels themselves: Higgins had clearly criticized the Court's approach, arguing that "there is no attempt by the Court to sift or differentiate or otherwise examine this evidence".[67]

The strength of an evidentiary element will thus depend on several circumstances such as, in Graziani's reconstruction: (i) what the evidence is intended to prove; (ii) its technical quality; and (iii) its credibility.[68] Courts may infer relevant information from any element produced at trial, authorizing them to consider the facts as proven before moving to the consideration of legal implications. As to the quality, there must be no doubt on the authenticity and the technical quality must be sufficiently high. Finally, the subject from which a given piece of evidence emanates will contribute to the court's assessment, taking into account criteria of objectivity, impartiality, plausibility, non-contradictoriness and logical consistency.

With reference instead to the evaluation of the overall evidentiary material presented before the court, the concept of the standard of proof indicates the degree of certainty necessary for the court to consider the burden of proof discharged. The rules of ICTs give no indication on the matter and the ICJ itself has on several occasions avoided referring to a specific standard, sometimes even adopting different criteria within the same judgment.[69] Thus, as the claim and circumstances of the case vary, "all depends on the norms at stake" and, as sustained by Justice Shahabuddeen, "the standard of proof varies with the character of the particular issue of fact", rendering particularly difficult to anticipate a certain outcome.[70]

In environmental damage claims, the standards most frequently adopted by the courts have been that of "sufficient" or "convincing" evidence, or that the evidence presented led *overwhelmingly* to the conclusion that one party's claim prevailed over the other's. In *Pulp Mills*, the ICJ had concluded that it

65 KAMTO, "Les moyens de prevue devant la Cour internationale de justice", *German Yearbook of International Law*, 2006, p. 259 ff., p. 263.

66 See RIDDEL and PLANT, *cit. supra* note 25, p. 186.

67 See *Oil Platforms* case, *cit. supra* note 29, Separate Opinion of Judge Higgins, paras. 37–38.

68 GRAZIANI, *cit. supra* note 38, pp. 282–300.

69 *Ibid.*, p. 320. For example, in *Corfu Channel* the Court uses "without doubts"; "decisive evidence" and "conclusive evidence".

70 KOLB, *General Principles of Procedural Law*, in ZIMMERMANN (ed.), *cit. supra* note 50, p. 839; ICJ, *Maritime delimitation and territorial questions between Qatar and Bahrain* (*Qatar v. Bahrain*), Jurisdiction and Admissibility, Judgment of 15 February 1995, ICJ Reports, 1995, p. 6 ff., Dissenting opinion of Judge Shahabuddeen, p. 63.

had been "convinced" by the evidence; that Argentina had not "convincingly" proved its claims; and that it had not been established "to the satisfaction of the Court" that there was a link between the damage and the mill's activity.[71] The evidence was therefore deemed "insufficient" and no "clear evidence" had been presented, leading the Court to find that there was no "conclusive evidence" of the actor's claim.[72] Likewise, in *Certain Activities* the Court refers equivalently to the standards of "convincing evidence" and "sufficient evidence".[73] The only international court that in environmental matters explicitly defined the applicable standard of proof was the *Eritrea-Ethiopia Commission,* which crystallized the standard of "clear and convincing evidence".[74]

In the WTO context, on the other hand, the existence of a *prima facie* case was recognized as a sufficient basis for ruling in favor of the claimant. In *EC – Hormones*, however, the Appellate Body clarified that "precisely how much and precisely what kind of evidence will be required to establish such a presumption will necessarily vary from measure to measure, provision to provision, and case to case".[75] Some panels have applied the "more likely than not" test, making therefore a prognostic judgment.[76]

In conclusion, it is particularly difficult to envisage a common standard of proof in inter-state litigation in general, but also specifically in environmental claims, as well as it is almost impossible to determine *ex ante* which standard the court may decide to adopt in a case. However, it seems possible to conclude that at least "sufficient", if not "convincing", evidence must be presented in order to win a claim for environmental harm.

6 Estimation of the Damage and Compensation

Moving to the last issues at stake, it is a principle of general international law that a corollary of an international wrongdoing is the obligation of the responsible

71 See *Pulp Mills on the River Uruguay* case, *cit. supra* note 11, paras. 210; 221–228 and 250.

72 *Ibid.*, paras. 254, 259 and 265.

73 *Certain Activities Carried Out by Nicaragua in the Border Area* (*Costa Rica v. Nicaragua*) *and Construction of a Road in Costa Rica along the San Juan River* (*Nicaragua v. Costa Rica*), Compensation, Judgment of 2 February 2018, ICJ Reports, 2018, p. 15 ff., paras. 119; 192 and 206.

74 *Eritrea-Ethiopia Claims Commission*, Final Award on Eritrea's Damages Claims of 17 August 2009. See WOLFRUM and MOLDNER, *cit. supra* note 63, para. 75.

75 *European Communities – Measures Concerning Meat and Meat Products* (*Hormones*), *cit. supra* note 29, para. 104.

76 *European Communities – Measures Affecting Asbestos and Asbestos-Containing Products*, Appellate Body Report, 12 March 2001, paras. 8.193–8.194.

State to repair the consequences. Therefore, in dealing with environmental harm, "compensation is due for damage caused to the environment, in and of itself, in addition to expenses incurred by an injured State as a consequence of such damage".[77] Compensation may also include reimbursement for losses of goods or services occurring during the restoration of the *ex ante* situation, such as clean-ups and subsequent monitoring.[78]

As argued by Boyle, the need for clear standards for the definition and estimation of environmental damage arises precisely when States decide to bring their claims before an international court, trying to obtain compensation for the damage they claim to have suffered and in situations where reparation of the tort through *restitutio in integrum* is not possible.[79] It is necessary to specify, however, that it is well established that "the absence of adequate evidence as to the extent of material damage will not, in all situations, preclude an award of compensation for that damage".[80] This principle was already highlighted in *Trail Smelter*, when the Tribunal held that "it would be a perversion of fundamental principles of justice to deny all relief to the injured person" and that it "will be enough if the evidence show the extent of the damages as a matter of just and reasonable inference, although the result be only approximate".[81]

Determining the value of the damage is always rather complex, but in environmental cases it might be of particular difficulty. International law does not prescribe any specific method of evaluation for the purposes of compensation for environmental damage, depending on the circumstances ruling in the case.[82] The ARSIWA Commentary to Article 36 provides an overview of the parameters to employ to evaluate the compensation to be awarded, including all costs incurred in preventing and clean-up procedures, aspects of biodiversity and 'non-use' values.[83]

77 See *Certain Activities Carried Out by Nicaragua in the Border Area* and *Construction of a Road in Costa Rica along the San Juan River* cases, *cit. supra* note 73, para. 41.

78 *Ibid.,* para. 42.

79 BOYLE, "Reparation for Environmental Damage in International Law: Some Preliminary Problems", in BOWMAN and BOYLE (eds.), *Environmental damage in international and comparative law*, Oxford, 2002, p. 17 ff., p. 23.

80 See *Certain Activities Carried Out by Nicaragua in the Border Area* and *Construction of a Road in Costa Rica along the San Juan River* cases, *cit. supra* note 73, para. 35; *Armed Activities on the Territory of the Congo* case, *cit. supra* note 18, para. 360.

81 See *Trail Smelter Arbitral Tribunal* case, *cit. supra* note 5, p. 1920.

82 *Ibid.*, para. 52.

83 International Law Commission, *Responsibility of States for Internationally Wrongful Acts, with commentaries*, 2001, p. 101.

In the application of such principles, in *Certain Activities*, the ICJ held that it was appropriate to estimate damage from the perspective of the entire eco-system "by adopting an overall assessment of the impairment or loss of environmental goods and services prior to recovery, rather than attributing values to specific categories".[84] It follows therefore that the Court proceeded in two stages, firstly identifying the primary damage and later the secondary damage – their direct consequences.[85]

The discipline reconstructed can be deemed to be applicable to compensation for damage in general, and not to be restricted to environmental harm. However, different kinds of harm might give rise to different ways in which to calculate compensation: for instance, in *Diallo*, equitable considerations were drawn upon to determine the amount of *compensatio*, that nonetheless was quantified in specific damage categories.[86] In recent cases however, as in *Certain Activities* and *DRC v. Uganda*, when it was considered particularly difficult to evaluate the presented evidence, the Court opted for the award of a "global sum". By softening the rules of causation, compensation is therefore based on the range of possibilities indicated by the evidence and considerations of fairness and equity, taking into consideration the gravity and the extent of the harm caused. However, what should be appreciated is that in the emerging practice, ICTs manage to reflect a full picture of the environmental damage, making reference to modern techniques that, although still lacking from a methodological elaboration that might endanger the outcome, permits to fit into the picture fairness and equity.

7 Conclusions

If compared to other fields, to effectively deal with environmental harm disputes, characterized by an abundance of facts and the massive introduction of scientific data, ICTs have tried to develop specific features, on occasion departing from generally applied rules of evidence. On one hand such difficulties raise the question of whether inter-state litigation is the most appropriate avenue for the consideration of matters of inter-state environmental damage. However, ways to deal with some of the shortcomings reconstructed in the work can already be found in emerging practice, and the increasing number of disputes has undoubtedly led to the progressive development of new

84 *Ibid.*, para. 78.
85 *Ibid.*, para. 79.
86 See *Ahmadou Sadio Diallo* case, *cit. supra* note 16, paras. 33 and 56.

strategies. This is clearly shown, for instance, in the growing use of experts by ICTs in assessing the evidence of environmental harm and, potentially, in the evaluation of the environmental damage as well. Moreover, other possible avenues to address such difficulties might be found in the possibility to allow for the submission of *amicus curiae* briefs from reputable sources, as well as borrow best practices from other international quasi-judicial or non-judicial mechanisms, including United Nations commissions, that dealt with similar issues.[87]

It is to be hoped that with the proliferation of new claims, international courts and tribunals will become increasingly aware of their role and thus able to assess the growing environmental challenges as effectively as possible.

87 RUDALL, *Compensation for Environmental Damage under International Law*, Oxon, 2020, p. 40.