1

Methodology and Sources

This chapter outlines the methodology and sources employed for this book. In launching this discourse, it is important to underscore that this book is grounded in the framework of legal positivism.[1] According to the school of thought of legal positivism, '[L]aw is a matter of social fact alone, and all law is posited – positive – law'.[2] As such, the book applies the selected methodology and tools in the framework of a doctrinal analysis. This approach, commonly known as the black-letter method, analyses the language of the law in primary and secondary sources, while sidestepping considerations of policy and historical context. Nonetheless, policy, historical factors and other academic disciplines are cursorily acknowledged, serving to enrich the overarching comprehension of the legal landscape. This approach ultimately aims to unify and clarify what may initially appear to be a fragmented set of rules. This harmonisation is accomplished by studying the relevant sources to identify the underlying principles and interests upon which rights are based.[3]

1.1 Methodology

Human rights are intentionally phrased in a generic and open-ended manner to allow for dynamic interpretation suited to current times (see Section 1.2.2.4). However, achieving a certain degree of consensus and

[1] On this topic, see, for example, Simma, 'Sources of International Human Rights Law: Human Rights Treaties', in S. Besson and J. d'Aspremont (eds.), *The Oxford Handbook of the Sources of International Law* vol. 1 (2018); Of a different view is Besson, 'Sources of International Human Rights Law: How General Is General International Law?', in S. Besson and J. d'Aspremont (eds.), *The Oxford Handbook of the Sources of International Law* vol. 1 (2018).

[2] Etkin, 'Legal Positivism', in C. Binder et al. (eds.), *Elgar Encyclopedia of Human Rights* vol. 3 (2022).

[3] Dobinson and Johns, 'Qualitative Legal Research', in M. McConville and W. H. Chui (eds.), *Research Methods for Law* (2007), at 18 ff.

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clarity on normative content is essential for the material justiciability of human rights. As such, the aim of this book is to establish the normative content of the right to science to render it justiciable. To elucidate this normative content, this book employs the methodology of treaty interpretation in accordance with the Vienna Convention on the Law of Treaties (VCLT), which can be combined with other methodologies elaborated by scholarship and practice. This book further adopts the violations approach, scrutinising concrete instances of non-compliance to clarify and delimit the justiciable normative content.

1.1.1 *Treaty Interpretation under the VCLT and ICESCR*

The methods for treaty interpretation detailed in Art. 31–33 VCLT hold the status of customary international law.[4] The ICESCR, adopted before the VCLT entered into force, accordingly embeds equivalent interpretative rules within its own text. Art. 5(1) ICESCR notably underscores that no provision of the Covenant should be interpreted as implying for any state, group or person any right to engage in any activity or to perform any act aimed at the destruction of any of the rights or freedoms recognised therein or at their limitation to a greater extent than provided for in the present Covenant. Meanwhile, Art. 5(2) ICESCR clarifies that the rights outlined in the Covenant cannot be used to limit any human rights guaranteed by national law or other treaties. In other words, they are considered the minimum standards and cannot be used to justify limiting other human rights. Additionally, specific interpretation rules appear in Art. 24 and 25 ICESCR, which state that the Covenant must not be interpreted in a way that would undermine the UN Charter or the

[4] International Law Commission (ILC), *Draft Conclusions on Subsequent Agreement and Subsequent Practice in Relation to the Interpretation of Treaties, with Commentaries, Adopted by ILC at Its 70th Session*, A/73/10 (2018), at Conclusion 2(1); the method of treaty interpretation is applicable in human rights law as human rights treaties fit within the definition of a treaty as given in the VCLT (Art. 2[1][a] VCLT). It is important to note that both human rights Covenants came into effect in 1976, before the VCLT, which entered into force in 1980. Although the VCLT contains a non-retroactivity provision (Art. 4 of the VCLT) – generally implying it should only apply to treaties concluded after its adoption – the methods of the VCLT remain pertinent to the ICESCR. This is due to the customary status of the VCLT's rules of interpretation. See O. Ammann, *Domestic Courts and the Interpretation of International Law: Methods and Reasoning Based on the Swiss Example* (2020), at 193, and see the references cited therein in footnote 1191; Fitzmaurice, 'Interpretation of Human Rights Treaties', in D. Shelton (ed.), *The Oxford Handbook of International Human Rights Law* (2013), at 7.

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rights of people to fully utilise their natural resources. Finally, Art. 31(1) ICESCR requires that versions of the Covenant in all languages be considered equally authentic.

As argued by Moeckli, Art. 5, 24 and 25 ICESCR, in relation to the interpretation of the Covenant, are a thorough explanation of the teleological interpretation method (see Section 1.1.2.3). Moreover, Art. 31(1) very much aligns with the principle of textual interpretation outlined in Art. 33 VCLT (see Section 1.1.2.1). In summary, the rules of interpretation in the ICESCR do not in fact differ from those in the VCLT and have no significant impact on the practice of the interpretation of the Covenant by the CESCR or other parties.[5] As such, the ICESCR's methods of interpretation cannot be categorised as *lex specialis*: they do not extend beyond the VCLT's established framework. In line with this, the interpretive methods employed in the ICESCR are consistent with Art. 31–33 VCLT, which is why this book focuses on the Vienna rules for treaty interpretation.

1.1.2 The Four Interpretation Methods under the VCLT

The Vienna rules of treaty interpretation entail four distinct methods of interpretation: textual, systematic, teleological and historical. These interpretative methods lack any hierarchical order, underscoring their equal significance in the practice of treaty interpretation.[6] All four methods are deployed in this book in a pluralistic manner. It is worth highlighting key points concerning each approach as they relate to establishing the justiciable normative content of the right to science.

1.1.2.1 Textual Interpretation

The first step in the interpretation of a treaty is textual, or grammatical, interpretation (Art. 31(1) and (4) VCLT). If a treaty has been authenticated in several languages, Art. 33 VCLT rules that, in the event of difficulties in interpreting the text, each version of the treaty should be

[5] Moeckli, 'Interpretation of the ICESCR', in D. Moeckli and H. Keller (eds.), *The Human Rights Covenants at 50: Their Past, Present, and Future*, 1st ed. (2018), at 52; see also Christoffersen, 'Impact on General Principles of Treaty Interpretation', in M. T. Kamminga and M. Scheinin (eds.), *The Impact of Human Rights Law on General International Law* (2009) 37.

[6] International Law Commission (ILC), 'Draft Articles on the Law of Treaties with Commentaries', II *Yearbook of the International Law Commission* (1966), at 220.

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regarded as equally authentic and authoritative.[7] The human rights understanding thus gains clarity when its formulation in each authentic language version is compared, thereby capturing its full textual background.

1.1.2.2 Systematic Interpretation

Systematic, or contextual, interpretation requires that a treaty be understood in its context (Art. 31(1) VCLT), which includes the text of the treaty itself and any preambles or annexes (Art. 31(2) VCLT).[8] The systematic interpretation method also reflects the human rights principles of indivisibility, interdependence and interrelatedness anchored in the Vienna Declaration and Programme of Action (see Section 4.1).[9] Such contextualisation is especially valuable when analysing the right to science alongside other interdependent human rights.

1.1.2.3 Teleological Interpretation

The teleological interpretation method holds that a treaty must be understood in its object and purpose (Art. 31(1) VCLT) and subsequent practice, which considers changing circumstances (Art. 31(3)(b) VCLT). Teleological interpretation allows an evolutive interpretation, meaning that evolving social needs and circumstances must be considered.[10] It could be argued that the justification for dynamic interpretation lies in the claim that it aligns with the original intention of the drafters, who even then understood that prevailing conditions would change over time. As such, they recognised the fallacy of limiting the applicability of human rights treaties to solely the circumstances existing at the time of their adoption.[11] As early as 1951, Judge Álvarez of the International Court of

[7] The relevant language versions of the ICESCR are Chinese, English, French Russian and Spanish (Art. 31 (1) ICESCR).

[8] The systematic method of interpretation is based on the principle of common sense and good faith, see International Law Commission (ILC), *supra* note 6, at 221; Furthermore, systematic interpretation aims to prevent contradictory applications of the law and actions by one state that have not been accepted by a sufficient number of other states. See Ammann, *supra* note 4, at 206 f. However, according to Ammann, this interpretation method can leave plenty of room for vagueness and cherry-picking.

[9] UN General Assembly, Vienna Declaration and Programme of Action, A/CONF.157/23, 25 June 1993, para. Part I, 5.

[10] See also International Law Commission (ILC), *supra* note 4, at Conclusion 8.

[11] Schabas, 'Study of the Right to Enjoy the Benefits of Scientific and Technological Progress and Its Applications', in Y. Donders and V. Volodin (eds.), *Human Rights in Education, Science and Culture: Legal Developments and Challenges* (2007), at 283.

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Justice (ICJ) stressed that human rights treaties 'must be interpreted without regard to the past, and only with regard to the future'.[12] In his view, human rights treaties 'have acquired a life of their own; they can be compared to ships which leave the yards in which they have been built, and sail away independently, no longer attached to the dockyard'.[13]

Furthermore, the overarching object in and purpose of human rights law is the protection of people and their rights. Accordingly, human rights treaties require interpretations that unequivocally favour the effective protection of these rights holders.[14] Such an approach is particularly fitting given this book's emphasis on the beneficiaries of the right to science. Judicial bodies such as the European and Inter-American human rights courts, and to a lesser extent the ICJ, have embraced what is commonly referred to as a *pro homine* approach which stresses that the option most favourable to the human being should be chosen.[15] In addition, as living instruments, human rights treaties should be interpreted in light of contemporary conditions and standards. While the HRC explicitly interprets the ICCPR in an evolutive or dynamic manner, the CESCR also does so, albeit less directly.[16] As Moeckli notes, although the Committee has not yet explicitly invoked the 'living instrument' character of the Covenant,[17] it has made it 'abundantly clear', for

[12] International Court of Justice (ICJ), *Reservations to the Convention on the Prevention and Punishment of the Crime of Genocide (Advisory Opinion) (Dissenting Opinion of Judge Álvarez)* (1951), at 53.

[13] Ibid.

[14] Mechlem, 'Treaty Bodies and the Interpretation of Human Rights', 42 *Vanderbilt Journal of Transnational Law* (2009) 905, at 912.

[15] Fitzmaurice, *supra* note 4, at 765 ff; Kowalska, 'Pro Homine Principle: An Axiological Compass in Interpretation Norms in the Field of Human Rights', *The Age of Human Rights Journal* (2021) 207; Ribeiro and De Oliveira Mazzuoli, 'The Pro Homine Principle as a Fundamental Aspect of International Human Rights Law', 17 *Meridiano 47 – Journal of Global Studies* (2016).

[16] Fitzmaurice, *supra* note 4, at 765 ff.

[17] See for example, Abi-Saab et al. (eds.), *Evolutionary Interpretation and International Law* (2019); Bernhardt, 'Evolutive Treaty Interpretation, Especially of the European Convention on Human Rights', 42 *German Yearbook of International Law* (1999) 11; Bjorge, *The Evolutionary Interpretation of Treaties* (2014); Fitzmaurice, 'Dynamic (Evolutive) Interpretation of Treaties, Part I', in *Hague Yearbook of International Law / Annuaire de La Haye de Droit International, Vol. 21 (2008)* (2009); 'Dynamic (Evolutive) Interpretation of Treaties, Part II', in *Hague Yearbook of International Law / Annuaire de La Haye de Droit International, Vol. 22 (2009)* (2010); Moeckli and White, 'Treaties as "Living Instruments"', in D. Kritsiotis and M. J. Bowman (eds.), *Conceptual and Contextual Perspectives on the Modern Law of Treaties* (2018).

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example in its pronouncements on the right to health[18] and its analysis of gender roles,[19] as well as on discrimination,[20] 'that the meaning of the ICESCR's terms can evolve over time'.[21]

1.1.2.4 Historical Interpretation

Historical interpretation may be used as 'supplementary means of interpretation' (Art. 32 VCLT), allowing interpreters to resort to *travaux préparatoires* (preparatory works)[22] to either confirm the meaning of a specific interpretation or determine this meaning if the result of the interpretation is ambiguous or obscure (Art. 32(a) VCLT) or leads to a result which is manifestly absurd or unreasonable (Art. 32(b) VCLT). The ILC has chosen to classify the method of historical interpretation as a supplementary means of treaty interpretation, because such consultation of the *travaux préparatoires* does not always add value to the interpretation and may even lead to misinterpretation. Furthermore, not all state parties to a (human rights) treaty participated in its drafting negotiations; some become party at a later stage.[23] While historical materials can clarify certain points, this book emphasises interpretative

[18] UN Committee on Economic, Social and Cultural Rights (CESCR), *General Comment No. 14: The Right to the Highest Attainable Standard of Health (Article 12 of the International Covenant on Economic, Social and Cultural Rights)*, E/C.12/2000/4 (2000), at 10.

[19] UN Committee on Economic, Social and Cultural Rights (CESCR), *General Comment No. 4: The Right to Adequate Housing (Art. 11 (1) of the Covenant)*, E/1992/23 (1991), at 10.

[20] Ibid., at 10 ('[t]he nature of discrimination varies according to context and evolves over time').

[21] Moeckli, *supra* note 5, at 55; Moeckli and White, *supra* note 17, at 143–54.

[22] Travaux préparatoires refer to the records and documents produced during the negotiation and drafting process of a treaty. These records can shed light on the intentions, discussions, agreements and compromises that led to the adopted text of the treaty. When referring to the travaux préparatoires, it is crucial to ensure that these documents are public and reflect a consensus of the state parties, rather than isolated positions or views that were ultimately discarded, see Ammann, *supra* note 4, at 215, with further references; for a general overview see Kolb, 'Legal History as a Source of International Law: From Classical to Modern International Law', in S. Besson and J. D'Aspremont (eds.), *The Oxford Handbook on the Sources of International Law*, 1st ed. (2018).

[23] Gardiner, 'Characteristics of the Vienna Convention Rules on Treaty Interpretation', in D. Kritsiotis and M. J. Bowman (eds.), *Conceptual and Contextual Perspectives on the Modern Law of Treaties* (2018), at 357. However, the ICJ and its predecessor, the Permanent Court of International Justice, often turned to the travaux préparatoires although the conditions for the application of Art. 32 VCLT were not met, see Ibid., at 346; and Ammann, *supra* note 4.

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methods that ensure the right to science is understood as a living, contemporary human right.

1.1.3 The Violations Approach

While treaty interpretation is a well suited methodology to provide contours to the rights and obligations of the right to science, it can reach its limits in terms of adjudication, especially when non-compliance results in a violation of state obligations vis-à-vis human rights.[24] To pinpoint the threshold at which the right to science is violated – or, put bluntly, to see where it 'bites' – a distinct methodology is required.

In the first twenty years after the ICESCR's entry into force in 1976, the implementation provision of progressive realisation proved difficult to monitor (Art. 2(1) ICESCR).[25] As the implementation of ESC rights was still in its infancy at that time, the violations approach was developed and pioneered as a methodology in 1995 as part of a larger study by the American Association for the Advancement of Science (AAAS).[26]

The violations approach is a methodology to detect violations and operationalise human rights. To analyse what amounts to a violation of a human right, the language of violations in reports submitted by state parties and NGOs, concluding observations, views and communications of the Committee must be examined.[27] This approach is a valuable

[24] For the constitutive elements of a human rights violation, see Kälin and Künzli, *The Law of International Human Rights Protection*, 2nd ed. (2019), at 114 f.

[25] The Committee itself acknowledged its difficulties for interpreting progressive realization under Art. 2(1) ICESCR. It is thus not astonishing that the Committee refrained from referring to progressive realization for assessing the performance of States parties. See UN Committee on Economic, Social and Cultural Rights (CESCR), *General Comment No. 3: The Nature of States Parties' Obligations (Art. 2, Para. 1, of the Covenant)*, E/1991/23 (1990), at 24; see also Chapman, 'A Violations Approach for Monitoring the International Covenant on Economic, Social and Cultural Rights', 18 *Human Rights Quarterly* (1996) 23, at 31 f.

[26] AAAS and HURIDOCS collaborated from 1996 to 1999 on the 'Economic, Social, and Cultural Rights Violations Project'. The study was published in two separate publications: S. A. Hansen, *Thesaurus of Economic, Social and Cultural Rights: Terminology and Potential Violations* (2000); A. McChesney, *Promoting and Defending Economic, Social and Cultural Rights: A Handbook* (2000), see also Chapman, *supra* note 25; 'Conceptualizing the Right to Health: A Violations Approach', 65 *Tennessee Law Review* (1997) 389.

[27] Chapman suggested analysing three types of violations: (1) violations deriving from governmental actions, laws and policies; (2) violations based on acts or policies reflecting discrimination; (3) violations resulting from the failure to implement a core minimum.

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method for elucidating the normative content of human rights, especially when this normative content is not yet fully understood.[28]

The violations approach was first embodied in the Limburg Principles, which set a precedent by illustrating how violations of ESC rights could be identified. This was a novel approach, as judicial bodies and governments had maintained the view that ESC rights could not be violated per se, as they require progressive realisation (Art. 2(1) ICESCR).[29]

The seeds planted in the Limburg Principles concerning violations of human rights bore fruit a decade later with the adoption of the Maastricht Guidelines on Violations of Economic, Social and Cultural Rights in 1997.[30] These guidelines are intended to assist those involved in monitoring and adjudication at the national, regional and international levels in identifying and addressing violations of ESC rights.[31] The

Regarding the terminology used to identify violations, it should be noted that there may be discrepancies in the language used by the Committee. Like other bodies within the UN, the Committee often tends to use diplomatic language and may be reluctant to explicitly label non-compliance as a violation. Thus, instead of calling a spade a spade, the Committee often resorts to more nuanced expressions such as 'subjects of concern', 'suggestions' or 'recommendations'. See Chapman, *supra* note 25, at 49. For the application of the violation approach to the right to education, see Coomans, 'Identifying Violations of the Right to Education', *SIM Special 20* (2007).

[28] Chapman and Russell, *Core Obligations: Building a Framework for Economic, Social and Cultural Rights* (2002), at 8.

[29] UN Commission on Human Rights, *Limburg Principles on the Implementation of the International Covenant on Economic, Social and Cultural Rights*, Items 8 and 14 of the provisional agenda, E/CN.4/1987/17 (1987), at Part 1(D). The Limburg Principles are a set of 103 principles that interpret and clarify the nature and scope of state obligations of the ICESCR's Member States. The organisers of this endeavour, namely the International Commission of Jurists, the Maastricht Centre for Human Rights and the Urban Morgan Institute for Human Rights Drafted in Maastricht invited academics, officials of intergovernmental organisations such as ILO, UNESCO, the WHO and NGOs, to Maastricht for the drafting of the principles. The Limburg Principles were submitted to the UN Commission on Human Rights by the government of Netherlands and subsequently published as a UN document in 1987. The Limburg Principles are composed of two parts, the first on the nature of obligations and the second on the state reporting procedure. Especially noteworthy is the clarification that, contrary to popular views, the rights in the ICESCR are indeed justiciable and therefore qualified for judicial review and enforcement. Moreover, the Limburg Principles pioneered by demonstrating how violations of ESC rights can be identified. This constituted a novel approach since judicial bodies and governments remained of the view that ESC rights cannot per se be violated since they are subject to progressive realisation (Art. 2[1] ICESCR). See also Coomans, 'Limburg Principles on Socioeconomic Rights', in *Encyclopedia of Human Rights* (2009).

[30] International Commission of Jurists (ICommJ), Maastricht Guidelines on Violations of Economic, Social and Cultural Rights, 26 January 1997.

[31] Ibid., at Introduction.

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Maastricht Guidelines define a violation of an ESC right as actions, omissions or patterns of discrimination.[32] Finally, the Maastricht Guidelines have influenced language on violations of ESC rights in subsequent General Comments and inspired jurisprudence related to the identification of violations of ESC rights.[33]

In conclusion, while the violations approach was once a useful methodology for clarifying the normative content of the right to science in periods of scarce information, recent developments have provided a more solid foundation. Notably, the adoption of the Maastricht Guidelines on Violations of ESC Rights and General Comment No. 25, on science and ESC rights, significantly improves our understanding of violations and the right to science's normative content. Against this backdrop, this book draws upon the violations approach as a conceptual and methodological starting point. However, the core content approach developed herein advances beyond the violations framework by shifting the focus from the reactive identification of breaches to a proactive delineation of what the right to science fundamentally demands. Whereas the violations approach is vital for identifying when a right has been infringed, the core content approach aims to define the essential, irreducible elements of the right that must be guaranteed at all times – without retrogression or exception. In doing so, it offers a more systematic articulation of the indispensable and justiciable aspects of the right to science.

1.2 Sources

The sources of international (human rights) law are delineated in Art. 38 (1) of the Statute of the ICJ (ICJ Statute), which categorises these into primary and secondary sources. Pursuant to Art. 38(1)(a)–(c) ICJ Statute, primary sources encompass legally binding instruments such as treaties, customary international law and general principles of law.[34] Conversely, secondary sources, as stipulated in Art. 38(1)(d) ICJ Statute, serve as

[32] Ibid., at 11 ff.

[33] Coomans, *supra* note 29.

[34] United Nations (UN), Statute of the International Court of Justice (ICJ-Statute), 18 April 1946. In addition to the conventional primary sources of international human rights law, this thesis will also refer to pertinent rules of international law beyond the human rights sphere, as stipulated by Art. 31(3)(c) VCLT. This inclusion broadens the analytical scope, ensuring a comprehensive interpretation of the relevant human rights provisions in the context of international law more generally.

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subsidiary means for the determination of rules of law and include judicial decisions and legal scholarship.[35]

What remains uncontentious are the primary sources of law. In the context of this book, human rights treaties, as specified in Art. 2(1)(a) VCLT,[36] particularly the ICESCR, hold significant relevance. Nevertheless, ambiguity remains regarding whether and how secondary sources can be regarded as sources of international human rights law.[37] Secondary sources of law are addressed in Art. 31(1)a–c and Art. 32 VCLT. For this book, the most crucial secondary sources are UN treaty body pronouncements, particularly general comments. According to the ILC Draft Conclusions, general comments ought to be seen as supplementary means of interpretation, in line with Art. 32 VCLT and Art. 38(1)(d) ICJ Statute.[38] Another significant secondary source for this book is judicial decisions (Art. 38(1)(d) ICJ Statute). While views by treaty bodies are

[35] Hollis, 'Sources in Interpretation Theories: An Interdependent Relationship', in S. Besson and J. D'Aspremont (eds.), *The Oxford Handbook on the Sources of International Law*, 1st ed. (2017), at 426.

[36] Fitzmaurice, Treaties, Max Planck Encyclopedia of Public International Law [MPEPIL], February 2021; Thirlway, *The Sources of International Law*, 2nd ed. (2019), at 37 ff.

[37] Art. 38(1) of the ICJ-Statute was adopted in 1920 and has remained unaltered since its adoption. Consequently, it is hardly surprising that debates have arisen concerning the extent to which this provision is congruent with the evolving landscape of contemporary international human rights law. The architecture of international human rights law has emerged post-1945 and has expanded continuously in an ad hoc manner, see Chinkin, 'Sources', in D. Moeckli, S. Shah and S. Sivakumaran (eds.), *International Human Rights Law*, 4th ed. (2022), at 66.

[38] Following the ILC's Draft Conclusions on Subsequent Agreement and Subsequent Practice, the pronouncements of treaty bodies may be instrumental for interpreters of the treaty 'in the discretionary way in which Art. 32 VCLT describes supplementary means of interpretation'. The justification for such a stance stems from the view that these statements are considered 'conduct mandated by the treaty the purpose of which is to contribute to the treaty's proper application'. Moreover, they serve to 'contribute to the determination of the ordinary meaning of the terms in their context and in light of the object and purpose of the treaty'. See International Law Commission (ILC), *supra* note 4, at 112 and 115 f.; Nolte, *Fourth Report on Subsequent Agreements and Subsequent Practice in Relation to the Interpretation of Treaties*, A/CN.4/694 (2016), at 10–27; Azaria, 'The Legal Significance of Expert Treaty Bodies Pronouncements for the Purpose of the Interpretation of Treaties', 22 *International Community Law Review* (2020) 33; Fitzmaurice, 'Subsequent Agreement and Subsequent Practice: Some Reflections on the International Law Commission's Draft Conclusions', 22 *International Community Law Review* (2020) 14, at 14–32, 18; Nolte, 'Still Setting the Frame: The Vienna Convention's Rules on Treaty Interpretation in the Light of the ILC Conclusions on Subsequent Agreements and Subsequent Practice', 24 *Austrian Review of International and European Law Online* (2021) 53, at 64–5.

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quasi-judicial in nature,[39] the ICJ supports this view and accords great weight to treaty body pronouncements.[40]

For this book, additional soft law instruments from international organisations relevant to the right to science, such as the UN Educational, Scientific and Cultural Organisation (UNESCO), are considered as subsidiary means for determining the rules of law.[41] These

[39] For example, the Human Rights Committee has characterised its views as possessing a quasi-judicial nature, see UN Human Rights Committee, *General Comment No. 33 Obligations of States Parties under the Optional Protocol to the International Covenant on Civil and Political Rights*, CCPR/C/GC/33 (2009), at 11 and 13. 'While the function of the Human Rights Committee in considering individual communications is not, as such, that of a judicial body, the Views issued by the Committee under the Optional Protocol exhibit some of the principal characteristics of a judicial decision. They are arrived at in a judicial spirit, including the impartiality and independence of Committee members, the considered interpretation of the language of the Covenant, and the determinative character of the decisions … The Views of the Committee under the Optional Protocol represent an authoritative determination by the organ established under the Covenant itself charged with the interpretation of that instrument. These Views derive their character, and the importance which attaches to them, from the integral role of the Committee under both the Covenant and the Optional Protocol.'

[40] International Court of Justice (ICJ), *Ahmadou Sadio Diallo (Republic of Guinea v. Democratic Republic of the Congo*, 30 November 2010, at 66. 'Although the Court is in no way obliged, in the exercise of its judicial functions, to model its own interpretation of the Covenant on that of the Committee, it believes that it should ascribe great weight to the interpretation adopted by this independent body that was established specifically to supervise the application of that treaty. The point here is to achieve the necessary clarity and the essential consistency of international law, as well as legal security, to which both the individuals with guaranteed rights and the States obliged to comply with treaty obligations are entitled.' Certainly, the pronouncements of the treaty bodies serve a dual function. On the one hand, they interpret existing human rights law, providing clarity and direction for its application. On the other hand, by virtue of their expertise and authority, these pronouncements can also contribute to the creation of new legal norms. The weight of the treaty body's expert opinion often gives these pronouncements considerable influence, shaping both national and international legal frameworks. Thus, while they may not have formal legislative power, their impact on the development of human rights law is considerable and should not be underestimated. Also of considerable importance as sources of human rights law, although not explicitly mentioned in Art. 38 (1)(d) of the ICJ Statute, are resolutions of international institutions. Examples include the UDHR and various forms of soft law, such as guidelines, codes of conduct and final instruments emanating from global summits held under the auspices of the United Nations. These are often considered as complementary means of interpretation under Art. 32 VCLT.

[41] I adhere to the notion that 'soft law' encompasses 'rules (prescribing conduct or otherwise establishing standards) that are in the process of becoming, though may not ultimately become, binding rules of international law, in the form of any of the established sources of international law – customary law, general principles of law, or as an authentic (binding) interpretation of a rule of treaty law', see Lagoutte, Gammeltoft-Hansen and

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instruments contribute to the refinement of existing rights through interpretation or the enhancement of implementation mechanisms.[42] The addition of soft law instruments as sources of treaty interpretation is known as the 'zebra approach'. Much like the zebra's distinctive stripes, this approach juxtaposes the black-and-white nature of binding and non-binding sources, thereby offering a more nuanced, comprehensive and multifaceted analysis. The zebra approach blends binding standards with non-binding soft law standards, which include declarations with near universal acceptance, such as the UDHR,[43] or legally non-binding documents, such as the 1993 Vienna Declaration on Human Rights.[44] Similar to non-binding persuasive authority in court decisions, this approach underscores the book's commitment to capturing a comprehensive range of norms and practices shaping the right to science, transcending rigid classifications and embracing the fluidity and dynamism of modern international law.[45] However, soft law instruments vary in normative weight and thus differ in legal value.

Finally, this book undertakes a thorough analysis of the international legal sources pertaining to the right to science, with a particular emphasis on the UN system. Although this book does not encompass regional or national perspectives, it selectively considers laws, policies and jurisprudence from these areas when relevant. Although regional and national sources vary in normative significance and may not apply uniformly in all regions, they may nonetheless offer useful insights for the under-explored right to science.

Cerone (eds.), *Tracing the Roles of Soft Law in Human Rights*, 1st ed. (2016). Accordingly, General Comments serve as authoritative interpretations of human rights provisions and can be categorised under the ambit of soft law. Though these General Comments are not directly adopted by states, they are formulated by the Committee responsible for interpreting treaty provisions on behalf of states.

[42] Chinkin, *supra* note 37, at 70.

[43] UN General Assembly, Universal Declaration of Human Rights (UDHR), Res 217 A(III), A/RES/3/217 A, 10 December 1948.

[44] UN General Assembly, *supra* note 9.

[45] Riedel, Giacca and Golay, 'The Development of Economic, Social, and Cultural Rights in International Law', in E. Riedel, G. Giacca and C. Golay (eds.), *Economic, Social, and Cultural Rights in International Law* (2014) 3, at 22 f.

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