

The Nexus between International Law and the Sustainable Development Goals

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The 17 Sustainable Development Goals (SDGs) and 169 targets did not emerge from, and were not inserted into, a normative vacuum. They are grounded in international law and made consistent with existing commitments expressed in various international legal instruments. Naturally, a nexus exists between international law and these global priorities. This article explores how to harness that nexus for sustainability. It examines to what extent the SDGs might be instrumental in orchestrating international institutions towards the common objective of sustainable development, and how international law provides a normative environment for the SDGs. The article argues that, although self-proclaimed as integrated and indivisible, the SDGs and targets reflect the fragmented structure of international law, and therefore would have limited utility for orchestration. The article then discusses how international law, despite its fragmented nature, provides integration tools that could address trade-offs between competing targets in a principled manner. A clear, long-term vision for sustainable development beyond 2030 is a necessary but absent leverage point in the SDG framework. It would define the point where the interacting SDGs and targets should ultimately converge.

INTRODUCTION

The 17 Sustainable Development Goals (SDGs) and 169 targets did not emerge from, and were not inserted into, a normative vacuum.¹ They are grounded in international law and made consistent with existing commitments expressed in various international agreements and other soft law instruments. Naturally, a nexus exists between international law and the SDGs. What is the nature of their relationship? To what extent, and in what ways, could international law and the SDGs complement each other to enhance systems integration?² This article explores these questions in two directions

with a view to harness the nexus for global sustainability.

First, are the SDGs instrumental in orchestrating various international institutions towards the ultimate objective of sustainable development? Immersed in their own mandates and objectives, most international institutions operate in relative isolation and may pursue competing interests.³ Some commentators have suggested that goal-setting – as a governance strategy to prioritize, motivate and provide direction – could help reform or rearrange existing institutions so as to enhance their overall performance in promoting sustainable development.⁴ How effective are the SDGs likely to be in lending coherence to what otherwise might be a disparate and even inconsistent collection of institutional arrangements? Will the SDGs bring into line existing regimes and organizations that are established for different purposes?

Second, is international law likely to be helpful for the implementation of the SDGs in an integrated manner? Despite being self-proclaimed as ‘integrated and indivisible’,⁵ the SDGs themselves have been criticized for lacking coherence.⁶ This is a concern because the experiences with the Millennium Development Goals (MDGs) have shown that addressing such governance goals independently may lead to unintended consequences.⁷ Some MDG targets were met,⁸ but the spirit of the MDGs was not. Then, to what extent and in what ways could international law, despite its fragmented nature, integrate the SDGs and targets and help achieve long-term sustainable development?⁹

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¹ Transforming Our World: The 2030 Agenda for Sustainable Development (UNGA Resolution A/RES/70/1, 21 October 2015) (‘The 2030 Agenda’).

² Systems integration refers to ‘holistic approaches to integrating various components of coupled human and natural systems’. J. Liu *et al.*, ‘Systems Integration for Global Sustainability’, 347:6225 *Science* (2015), 1258832-1, at 1258832-1.

³ Fragmentation of International Law: Difficulties Arising from the Diversification and Expansion of International Law – Report of the Study Group of the International Law Commission (UNGA Doc. A/CN.4/L.682, 13 April 2006) (‘ILC Study Group report’).

⁴ N. Kanie and F. Biermann (eds.), *Governance through Goals: New Strategies for Sustainable Development* (MIT Press, 2016, forthcoming).

⁵ The 2030 Agenda, n. 1 above, at paragraph 5.

⁶ ICSU and ISSC, *Review of Targets for the Sustainable Development Goals: The Science Perspective* (International Council for Science, 2015).

⁷ D. Griggs *et al.*, ‘An Integrated Framework for Sustainable Development Goals’, 19:4 *Ecology and Society* (2014), 49.

⁸ United Nations, *The Millennium Development Goals Report 2015* (United Nations, 2015).

⁹ Similar questions were raised in the context of the MDGs in E. Hey, ‘The MDGs, Archeology, Institutional Fragmentation and International Law: Human Rights, International Environmental and Sustainable (Development) Law’, in: H.R. Fabri, R. Wolfrum and J. Gogolin (eds.), *Select Proceedings of the European Society of International Law, Volume 2, 2008* (Hart, 2010), 488.

The article starts with an overview of the relationship between international law and the SDGs. It examines how the SDGs could be instrumental in orchestrating international institutions. The analysis is conducted at three levels: orchestration within a goal, within a goal cluster and across the three dimensions of sustainable development. The article then reviews the concept of sustainable development in international law by focusing on how it has been interpreted and applied as a principle of integration by international courts and tribunals. It gives a few hypothetical examples where the principle could be used to address normative conflicts among the SDGs and targets. The article concludes that a clear, long-term vision for sustainable development beyond 2030 is a necessary but absent leverage point in the SDG framework. This vision, ideally expressed in the form of a sustainability *grundnorm*, would define the point where the interacting goals and targets should ultimately converge.

THE RELATIONSHIP BETWEEN INTERNATIONAL LAW AND THE SUSTAINABLE DEVELOPMENT GOALS

Since the late 1980s, sustainable development has emerged as a collective goal of the world community, and international law has been gradually aligning to it.¹⁰ The adoption of the SDGs through a United Nations (UN) Member-State-led process with civil society participation provides an opportunity to further reinforce the legal status of the sustainable development concept. The SDGs themselves are political goals, not legal rules. However, the substance that the SDGs reflect (some of which are international custom¹¹) and the process by, and form in, which they were adopted indicate that at least some SDGs or targets may qualify as soft law.¹²

The SDGs were established, and are to be implemented, in a manner that is consistent with the rights and obligations of States under international law.¹³ The 2030

Agenda for Sustainable Development, which contains the SDGs, is guided or informed by a number of international legal instruments.¹⁴ Specifically mentioned instruments include the UN Charter,¹⁵ the Universal Declaration of Human Rights¹⁶ and the Rio Declaration on Environment and Development.¹⁷ In a number of cases, international agreements from which the SDG targets were derived can be identified by the wording of the targets.¹⁸ For example, target 15.7 for ending poaching and trafficking of protected species is traceable to the objective of the Convention on International Trade in Endangered Species of Wild Fauna and Flora.¹⁹

However, not all existing international commitments have made it into the new Agenda. The SDGs and targets are intended to 'stimulate action over the next 15 years in areas of critical importance for humanity and the planet',²⁰ hence they focus on and address priority areas.²¹ For example, no goal or target for addressing stratospheric ozone depletion was adopted, despite the Ozone Secretariat's effort to embed ozone protection in the 2030 Agenda.²² This is probably because the Montreal Protocol has been a success in phasing out the use of ozone-depleting substances, and ozone depletion is no longer considered as an issue that requires urgent attention.²³

The SDGs and targets are, therefore, best conceptualized as a *subset* of existing intergovernmental commitments. The natural fit between the SDGs and international law suggests some degree of commitment on either side to combine the two approaches to achieve sustainable development. On the one hand, as many of the targets are already embedded in various international agreements, the SDGs, to the extent they are truly integrated, could serve as a 'coordinating and syn-

¹⁴ The Future We Want, n. 10 above, at paragraphs 10–12.

¹⁵ Charter of the United Nations (San Francisco, 26 June 1945; in force 24 October 1945).

¹⁶ Universal Declaration of Human Rights (UNGA Resolution A/RES/3/217A, 10 December 1948).

¹⁷ Rio Declaration, n. 10 above.

¹⁸ 'Compendium of Existing Goals and Targets under the 19 Focus Areas being Considered by the Open Working Group', found at: <<http://www.stakeholderforum.org/fileadmin/files/Compendium%20of%20existing%20targets%20and%20indicators.xlsx>>; M. Gehring, 'Sustainable Development Goals and the Law', found at: <http://www.dfg.de/download/pdf/dfg_im_profil/geschaefsstelle/dfg_praesenz_ausland/nordamerika/2015/150421_dfg_unu_konferenz/04_01_gehring.pdf>.

¹⁹ Convention on International Trade in Endangered Species of Wild Fauna and Flora (Washington, DC, 3 March 1973; in force 1 July 1975) ('CITES').

²⁰ The 2030 Agenda, n. 1 above, at preamble.

²¹ The Future We Want, n. 10 above, at paragraph 247.

²² Embedding Ozone Protection in the Sustainable Development Agenda: Note by the Secretariat (UN Doc. UNEP/OzL.Pro.WG.1/33/INF/4, 21 June 2013).

²³ Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal, 16 September 1987; in force 1 January 1989). See, e.g., J.A. Mäder *et al.*, 'Evidence for the Effectiveness of the Montreal Protocol to Protect the Ozone Layer', 10 *Atmospheric Chemistry and Physics* (2010), 12161.

¹⁰ Report of the World Commission on Environment and Development (UN Doc. A/42/427, 4 August 1987), Annex ('Our Common Future'); Rio Declaration on Environment and Development (UN Doc. A/CONF.151/26/Rev.1 (Vol. I), 14 June 1992), Annex ('Rio Declaration'); Plan of Implementation of the World Summit on Sustainable Development (UN Doc. A/CONF.199/20, 4 September 2002), Annex; The Future We Want (UNGA Resolution A/RES/66/288, 11 September 2012), Annex.

¹¹ Some scholars argue that the MDGs have the status of international customary law. See, e.g., G. Nankani, J. Page and L. Judge, 'Human Rights and Poverty Restriction Strategies: Moving towards Convergence?', in: P. Alston and M. Robinson (eds.), *Human Rights and Development: Towards Mutual Reinforcement* (Oxford University Press, 2005).

¹² On the concept of soft law, see, e.g., D. Thürer, 'Soft Law', in: R. Wolfrum (ed.), *Max Planck Encyclopedia of Public International Law* (Oxford University Press, 2009).

¹³ The Future We Want, n. 10 above, at paragraph 58(a); The 2030 Agenda, n. 1 above, at paragraph 18.

thesizing framework' for addressing the fragmentation of international law.²⁴ On the other hand, international law provides a normative context in which the SDGs and targets should operate and interact with each other.²⁵

There is, however, at least one potentially negative consequence of deriving the goals and targets from existing intergovernmental commitments: the SDGs mirror the fragmented and compartmentalized structure of international law.²⁶ While acknowledging the importance of addressing interlinkages,²⁷ States have maintained the functionalist thinking that underpins the UN system.²⁸ In other words, 'silozation' is precisely what the SDGs are supposed to counteract, but the SDGs themselves are presented using a silo approach.²⁹ The drafters did not employ systems thinking when goal-setting and ended up forming a *list* of equally important global priorities.³⁰ The non-hierarchical organization of the SDGs is problematic because the goals and targets interact. While some targets are interdependent or reinforce each other, some impose constraints on others.³¹ Critical trade-offs will not be uncommon. Just like different objectives of international agreements point in different directions and may come into conflict, some of the SDGs and targets themselves are likely to compete for scarce resources or shift, rather than solve, problems. In the absence of an internal mechanism to enhance synergies or address trade-offs, it is conceivable that, even in an ideal world where all the SDG targets are met individually, the outcome may not necessarily be the desired state of sustainable development.³²

In order to make the whole (the SDG framework) greater than the sum of its parts (the goals and targets), the SDGs will need to be developed into a more coher-

ent set of priorities. The SDGs could potentially have a positive effect by serving as an orchestration tool for achieving systems integration. Certain principles of international law such as the principle of integration may provide normative guidance as to how the goals and targets should relate to each other, and thereby avoiding 'a state of normative anarchy'.³³

THE SUSTAINABLE DEVELOPMENT GOALS FOR ORCHESTRATING INTERNATIONAL AGREEMENTS

The traditional approaches to resolving treaty conflicts, as set out in the Vienna Convention on the Law of Treaties,³⁴ have been constrained to treaty interpretation and conflict resolution principles such as *lex specialis* and *lex posterior*.³⁵ Many consider these tools are insufficient to provide adequate solutions in the event of a normative conflict among sustainable development priorities.³⁶ As an alternative to the legal approach, goal-setting has been suggested as a potentially effective tool under certain conditions for orchestrating international agreements and institutions.³⁷ The concept of orchestration generally refers to 'efforts at arranging different elements of a system in harmony with each other so as to enhance their collective performance'.³⁸ In the global governance literature, the concept has been used more precisely as a reference to a governance strategy of an international organization that works indirectly through other intermediary actors in pursuit of its own goals.³⁹ A number of orchestrators exist in the field of sustainable development including treaty bodies, liaison groups, UN agencies and intergovernmental forums. The usefulness of the SDGs in terms of orchestration can be examined at three different levels of analysis, that is, orchestration within an SDG, across a few SDGs in the same goal cluster,⁴⁰ and across

²⁴ See D. Griggs *et al.*, n. 7 above, at 6.

²⁵ On international law as a normative system, see, e.g., R. Higgins, *Problems and Process: International Law and How We Use It* (Oxford University Press, 1994).

²⁶ See, e.g., ILC Study Group report, n. 3 above; J. Pauwelyn, 'Fragmentation of International Law', in: R. Wolfrum, n. 12 above. For a discussion on the difference between fragmentation and compartmentalization, see K. Bosselmann, 'Losing the Forest for the Trees: Environmental Reductionism in the Law', 2:8 *Sustainability* (2010), 2424.

²⁷ The 2030 Agenda, n. 1 above, at preamble. See also target 17.14 for enhancing policy coherence for sustainable development.

²⁸ See E. Hey, n. 9 above.

²⁹ S. Bernstein, 'The United Nations and the Governance of Sustainable Development Goals', in: N. Kanie and F. Biermann, n. 4 above; ICSU and ISSC, n. 6 above.

³⁰ On systems thinking, see, e.g., D.H. Meadows, *Thinking in Systems: A Primer* (Chelsea Green, 2008).

³¹ See ICSU and ISSC, n. 6 above.

³² Indicators 'may sometimes provide inconsistent or even conflicting perspectives on progress'. *Ibid.*, at 86. See also J. Lyytimäki and U. Rosenström, 'Skeletons Out of the Closet: Effectiveness of Conceptual Frameworks for Communicating Sustainable Development Indicators', 16 *Sustainable Development* (2008), 301; L. Pintér *et al.*, 'Bellagio STAMP: Principles for Sustainability Assessment and Measurement', 17 *Ecological Indicators* (2012), 20.

³³ ICJ 25 September 1997, *Gabčíkovo-Nagymaros Project (Hungary v. Slovakia)*, [1997] ICJ Rep 7 ('*Gabčíkovo-Nagymaros*'), at 90.

³⁴ Vienna Convention on the Law of Treaties (Vienna, 22 May 1969; in force 27 January 1980).

³⁵ C.J. Borgen, 'Treaty Conflicts and Normative Fragmentation', in: D.B. Hollis (ed.), *The Oxford Guide to Treaties* (Oxford University Press, 2012), 448; A. Sadat-Akhavi, *Methods of Resolving Conflicts between Treaties* (Kluwer Law International, 2003).

³⁶ See, e.g., R. Wolfrum and N. Matz, *Conflicts in International Environmental Law* (Springer, 2003); C. Voigt, *Sustainable Development as a Principle of International Law: Resolving Conflicts between Climate Measures and WTO Law* (Martinus Nijhoff, 2009); H. van Asselt, *The Fragmentation of Global Climate Governance: Consequences and Management of Regime Interactions* (Edward Elgar, 2014).

³⁷ A. Underdal and R.E. Kim, 'The Sustainable Development Goals and Multilateral Agreements', in: N. Kanie and F. Biermann, n. 4 above.

³⁸ *Ibid.*

³⁹ K.W. Abbott *et al.* (eds.), *International Organizations as Orchestrators* (Cambridge University Press, 2015).

⁴⁰ The classification of the SDGs is adapted from R. Costanza *et al.*, 'An Overarching Goal for the UN Sustainable Development Goals', 5 *Solutions* (2015), 13.

the economic, social and environmental goals of sustainable development.

WITHIN A GOAL

Goal 13 on 'climate action' makes it clear that the UN Framework Convention on Climate Change (UNFCCC) is 'the primary international, intergovernmental forum for negotiating the global response to climate change'.⁴¹ In a recent decision adopting the Paris Agreement, the Conference of the Parties to the UNFCCC welcomes the adoption of the SDGs with special reference to Goal 13.⁴² This reciprocal acknowledgement reaffirms the centrality of the UNFCCC in the emerging polycentric climate governance system.⁴³ Its treaty bodies such as the secretariat and the Conference of the Parties can be seen as key orchestrators, which work indirectly through intermediaries to govern a third set of actors (the targets),⁴⁴ in pursuit of the ultimate objective of the UNFCCC.⁴⁵ However, it remains unclear what added values Goal 13 might bring to global climate governance, especially when the ambiguously worded targets provide no clear guidance.

The targets for Goals 14 and 15 on 'life below water' and 'life on land', respectively, fall within the mandates of a number of key multilateral environmental agreements. In relation to orchestration, two contrasting effects can be expected. On the one hand, these SDGs could spur 'clustering' of the agreements within their own issue areas.⁴⁶ For example, Goal 15 may strengthen the work of the Biodiversity Liaison Group by serving as its collective goal.⁴⁷ In fact, the targets under Goal 15 reflect

the specific objectives of several biodiversity-related conventions.⁴⁸ Similarly, Goal 14 reinforces the marine environment treaty cluster around the UN Convention on the Law of the Sea (UNCLOS),⁴⁹ the implementation of which is mentioned as a critical factor for achieving the goal.⁵⁰ On the other hand, however, because most targets were derived from existing commitments under international agreements, treaty bodies or other intergovernmental organizations might actually resist governance embedded in goal-setting at a higher level.⁵¹

WITHIN A GOAL CLUSTER

The SDGs have not been formally classified as one of economic, social and environmental goals, but Goals 13, 14 and 15 have been commonly identified as forming an environmental goal cluster. Do these three goals together help international organizations such as the UN Environment Programme to orchestrate international institutions in pursuit of a common environmental objective? Orchestration of international environmental agreements is critical because 'Earth is a single, complex, integrated system' with planetary boundaries operating as an interdependent set.⁵² At the same time, institutional fragmentation is particularly pervasive in international environmental law where there is a plethora of agreements, but no clearly identifiable overarching goal that would give all international regimes and organizations a shared purpose to which their more specific activities must contribute.⁵³

The SDG framework does not include an overarching environmental goal. Probably the closest to such a goal is the determination of the international community expressed in the preamble of the 2030 Agenda 'to pro-

⁴¹ The 2030 Agenda, n. 1 above, at paragraph 31.

⁴² UNFCCC, Decision 1/CP.21, Adoption of the Paris Agreement (UN Doc. FCCC/CP/2015/10/Add.1, 29 January 2016), at preamble.

⁴³ R.O. Keohane and D.G. Victor, 'The Regime Complex for Climate Change', 9:1 *Perspectives on Politics* (2011), 7; R. Moncel and H. van Asselt, 'All Hands on Deck! Mobilizing Climate Change Action beyond the UNFCCC', 21:3 *Review of European Community and International Environmental Law* (2012), 163; A.J. Jordan *et al.*, 'Emergence of Polycentric Climate Governance and its Future Prospects', 5:11 *Nature Climate Change* (2015), 977.

⁴⁴ United Nations Framework Convention on Climate Change (New York, 9 May 1992; in force 21 March 1994) ('UNFCCC'), Articles 7.2 (1) and 8.2(e). The relevant international institutions would include the Montreal Protocol, the Convention on Long-Range Transboundary Air Pollution, the International Maritime Organization regulating air pollution from marine vessels, and biodiversity-related conventions. See generally T. Hale and C. Roger, 'Orchestration and Transnational Climate Governance', 9:1 *Review of International Organizations* (2014), 59.

⁴⁵ UNFCCC, n. 44 above, Article 2.

⁴⁶ On the concept of clustering, see S. Oberthür, 'Clustering of Multilateral Environmental Agreements: Potentials and Limitations', 2:3 *International Environmental Agreements: Politics, Law and Economics* (2002), 317; K. von Moltke, 'On Clustering International Environmental Agreements', in: G. Winter (ed.), *Multilevel Governance of Global Environmental Change: Perspectives from Science, Sociology and the Law* (Cambridge University Press, 2006), 409.

⁴⁷ See <<https://www.cbd.int/blg>>.

⁴⁸ E.g., Convention on Biological Diversity (Rio de Janeiro, 5 June 1992; in force 29 December 1993) ('CBD'); Convention on Wetlands of International Importance, especially as Waterfowl Habitat (Ramsar, 2 February 1971; in force 21 December 1975); Convention on the Conservation of Migratory Species of Wild Animals (Bonn, 23 June 1979; in force 1 November 1983); International Plant Protection Convention (Rome, 6 December 1951; in force 3 April 1952); CITES, n. 19 above.

⁴⁹ United Nations Convention on the Law of the Sea (Montego Bay, 10 December 1982; in force 16 November 1994) ('UNCLOS').

⁵⁰ The 2030 Agenda, n. 1 above, target 14.c.

⁵¹ See S. Bernstein, n. 29 above.

⁵² W. Steffen *et al.*, 'Planetary Boundaries: Guiding Human Development on a Changing Planet', 347:6223 *Science* (2015), 1259855. See also V. Galaz *et al.*, 'Polycentric Systems and Interacting Planetary Boundaries – Emerging Governance of Climate Change–Ocean Acidification–Marine Biodiversity', 81 *Ecological Economics* (2012), 21; M. Nilsson and Å. Persson, 'Can Earth System Interactions Be Governed? Governance Functions for Linking Climate Change Mitigation with Land Use, Freshwater and Biodiversity Protection', 81 *Ecological Economics* (2012), 10.

⁵³ R.E. Kim and K. Bosselmann, 'International Environmental Law in the Anthropocene: Towards a Purposive System of Multilateral Environmental Agreements', 2:2 *Transnational Environmental Law* (2013), 285.

tect the planet from degradation . . . so that it can support the needs of the present and future generations'.⁵⁴ This statement recognizes a healthy planetary environment as a prerequisite for meeting the needs of people. However, this is not intended as a statement of a goal, and hence lacks the necessary attributes – content and intensity – on what needs to be done and to what degree.⁵⁵ For example, the needs of the present and future generations are not defined, although this is the question that has plagued the sustainable development debate since the publication of 'Our Common Future'.⁵⁶ Furthermore, the term degradation is not defined, hence it remains unclear as to what extent or in what ways the environment should be protected or given priority over development. No qualifier such as 'serious', 'significant' or 'irreversible' is used, but the scope would certainly not include *any* degradation.

The three distinct environmental SDGs operating in the absence of an overarching environmental goal may in effect reinforce the division of the global environment into three arbitrary categories, that is, the atmosphere, the land and the ocean. Such a division can be counter-productive to achieving the individual environmental goals because Earth's subsystems, including the climate system, often cut across the atmosphere, the land and the ocean. However, a number of crosscutting targets create critical connections across the boundaries and help weave the three spheres together. For example, target 14.1 on land-based sources of marine pollution links Goals 14 and 15, and target 14.3 on ocean acidification links Goals 13 and 14. These two targets would demand 'hardening' of the Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities⁵⁷ into a treaty as well as an adequate recognition of the role of oceans in the carbon cycle under the UNFCCC, respectively. It remains to be seen how effective the targets might be in enabling appropriate institutional responses to system-wide interactions and their effects.⁵⁸

ACROSS THE THREE DIMENSIONS

Unlike the MDGs, the SDGs are not merely about development. The SDGs are intended to promote *sustainable* development in its three dimensions – economic, social and environmental. The task of balancing the competing interests is not an easy one, and requires difficult choices on the part of States and relevant international organizations. Take the example of the global priority of feeding everyone (Goal 2). Under business as usual, this policy imperative is likely to translate into a greater demand for fertilizers, which in turn will increase pollutant or nutrient run-off into terrestrial or marine ecosystems (Goals 14 and 15). Measures identified in target 2.4, that is, to promote 'sustainable food production systems' and 'resilient agricultural practices', may address food security and the environment at the same time.⁵⁹ Importantly, however, such measures may not necessarily be those that are most efficient in the economic sense. The success of an orchestrator of the SDGs will be contingent upon the extent to which it can influence States and international organizations to act altruistically and cooperatively towards the mutually beneficial goal of sustainable development.

Each SDG has multiple orchestrators, which in turn need to be orchestrated. A key 'orchestrator of orchestrators' for the SDGs is the High-Level Political Forum for Sustainable Development (HLPF) under the auspices of the UN Economic and Social Council. It was established by the 2012 UN Conference on Sustainable Development to replace the Commission on Sustainable Development. The HLPF faces a number of challenges to effectively orchestrate international institutions.⁶⁰ Notably, the HLPF is not guided by a single goal, but multiple goals and targets that point in different directions. The SDGs have indeed been criticized for failing to incorporate a compelling narrative to describe how the world would look when the goals are fully achieved.⁶¹

⁵⁴ The 2030 Agenda, n. 1 above, at preamble.

⁵⁵ G.P. Latham and E.A. Locke, 'Self-Regulation through Goal Setting', 50 *Organizational Behavior and Human Decision Processes* (1991), 212.

⁵⁶ Our Common Future, n. 10 above.

⁵⁷ Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities (UN Doc. UNEP(OCA)/LBA/IG.2/7, 5 December 1995).

⁵⁸ For example, the new Paris Agreement lacks the necessary features that a new climate agreement should have included for the purpose of concurrently addressing ocean acidification (for a discussion on what these features are, see, e.g., R.E. Kim, 'Is a New Multilateral Environmental Agreement on Ocean Acidification Necessary?', 21:3 *Review of European Community and International Environmental Law* (2012), 243). The Paris Agreement merely *notes* in the preamble 'the importance of ensuring the integrity of all ecosystems, including oceans, and the protection of biodiversity, recognized by some cultures as Mother Earth'. Decision 1/CP.21, n. 42 above, Annex, at preamble.

⁵⁹ The 2030 Agenda, n. 1 above, target 2.4. Three proposed indicators for this target include 'percentage of agricultural area under sustainable agricultural practices', 'percent of agricultural households using irrigation systems compared to all agricultural households' and 'percent of agricultural households using eco-friendly fertilizers compared to all agricultural households using fertilizers'. UN Department of Economic and Social Affairs Statistics Division, 'Open Consultation on Green Indicators: Compilation of Inputs by the Observers of IAEG-SDGs and Other Stakeholders (4 Nov–7 Nov 2015)', found at: <http://unstats.un.org/sdgs/files/open-consultation-iaeg-2/Open%20Consultation%204-7%20Nov%202015_All%20Goals_V6.xlsx>.

⁶⁰ See S. Bernstein, n. 29 above. See also K.W. Abbott and S. Bernstein, 'The High-Level Political Forum on Sustainable Development: Orchestration by Default and Design', 6:3 *Global Policy* (2015), 222; S. Bernstein, 'The Role and Place of the High-Level Political Forum in Strengthening the Global Institutional Framework for Sustainable Development' (2013), found at: <<https://sustainabledevelopment.un.org/content/documents/2331Bernstein%20study%20on%20HLPF.pdf>>.

⁶¹ See ICSU and ISSC, n. 6 above, at 10.

The 2030 Agenda sets out '[o]ur vision' in three paragraphs, but it simply reiterates key priority areas embedded in the individual SDGs.⁶² The Open Working Group of the General Assembly on Sustainable Development Goals that developed the SDGs considered '[p]overty eradication, changing unsustainable and promoting sustainable patterns of consumption and production and protecting and managing the natural resource base of economic and social development' as equally important 'overarching objectives of and essential requirements for sustainable development'.⁶³ Difficult political debates about ultimate foundations were avoided by the Open Working Group.⁶⁴ One commentator explains that 'the virtue of the designed ambiguity and inclusiveness of the sustainable development concept in enabling political agreement on the SDGs ... militated against the articulation of ... an underlying normative vision'.⁶⁵ The HLPF as an orchestrator faces a daunting challenge to address critical trade-offs in the absence of a clearly agreed and defined, high-level reference point.

INTERNATIONAL LAW FOR INTEGRATING THE SUSTAINABLE DEVELOPMENT GOALS AND TARGETS

Striking a balance between the competing demands of development and environmental protection has always been at the crux of the sustainable development challenge. As equal priorities, however, the SDGs *per se* provide little guidance as to where the balance lies between, for example, food security and environmental integrity. When implementing the SDGs, it might become necessary to have recourse to what the MDGs referred to as the 'principles of sustainable development'⁶⁶ and, in particular, the principle of integration and interrelationship.⁶⁷ This part explores the potential of sustainable development as an 'adjudicatory norm', which would help to build cooperative relationships

⁶² The first paragraph is about poverty, hunger, health, peace, education, water and sanitation, food and energy (Goals 1, 2, 3, 4, 6, 7 and 11). The second paragraph is about human rights and human dignity, the rule of law, justice, equality and non-discrimination (Goals 5, 10 and 16). The third paragraph is about economic growth and the environment (Goals 8, 9, 12, 13, 14 and 15).

⁶³ Report of the Open Working Group of the General Assembly on Sustainable Development Goals (UN Doc. A/68/970, 12 August 2014), at paragraph 3. The same language appears in the outcome document of the United Nations Conference on Sustainable Development. *The Future We Want*, n. 10 above.

⁶⁴ N. Kanie, S. Bernstein and P.M. Haas, 'Introduction: Global Governance through Goal Setting', in: N. Kanie and F. Biermann, n. 4 above.

⁶⁵ See S. Bernstein, n. 29 above.

⁶⁶ MDG target 7A. See <<http://www.un.org/millenniumgoals>>.

⁶⁷ ILA New Delhi Declaration of Principles of International Law Relating to Sustainable Development, 2 April 2002 (UN Doc. A/CONF.199/8, 9 August 2002) ('ILA New Delhi Declaration').

among the SDGs and targets by treating them as instruments for achieving a common objective.

SUSTAINABLE DEVELOPMENT AS A PRINCIPLE OF INTEGRATION

The concept of sustainable development has ancient roots,⁶⁸ but it has been popularized since the 1992 Rio Declaration on Environment and Development. The 2002 ILA New Delhi Declaration of Principles of International Law Relating to Sustainable Development notes that 'sustainable development is now widely accepted as a global objective',⁶⁹ and that 'the concept has been amply recognized in various international and national legal instruments, including treaty law and jurisprudence at international and national levels'.⁷⁰ For example, the Treaty on European Union, as amended in 1997, includes a reference to 'the principle of sustainable development' in its preamble.⁷¹ According to one analysis, references to sustainable development can be found in over 300 conventions, 112 among which are multilateral, and roughly 30 are aimed at universal participation.⁷² Importantly, more than 200 references are found in the operative part of the conventions. Although the international legal status of sustainable development remains a subject of debate, the concept has already influenced the outcome of several judicial decisions of various international courts and tribunals, and it is increasingly understood and emerging as a general principle of international law.

The first time the International Court of Justice (ICJ) faced a dispute concerning the conflict between economic development and environmental protection was in the *Gabčíkovo-Nagymaros* case.⁷³ The ICJ invoked sustainable development as an international legal concept that refers to the 'need to reconcile economic development with protection of the environment'.⁷⁴ In practice, the ICJ 'applied and accepted the concept as having direct normative force, which could be indicative of the status as a principle'.⁷⁵ The Vice-President Weeramantry made this point explicit in his Separate Opinion and made a compelling case that sustainable

⁶⁸ D. Mebratu, 'Sustainability and Sustainable Development: Historical and Conceptual Review', 18:6 *Environmental Impact Assessment Review* (1998), 493; C.G. Weeramantry, *Universalsing International Law* (Martinus Nijhoff, 2004); U. Grober, *Deep Roots – A Conceptual History of 'Sustainable Development' (Nachhaltigkeit)* (Social Science Research Center Berlin, 2007).

⁶⁹ See ILA New Delhi Declaration, n. 67 above.

⁷⁰ *Ibid.*

⁷¹ Consolidated Version of the Treaty on European Union, [2012] OJ C326/13.

⁷² V. Barral, 'Sustainable Development in International Law: Nature and Operation of an Evolutive Legal Norm', 23:2 *European Journal of International Law* (2012), 377.

⁷³ *Gabčíkovo-Nagymaros*, n. 33 above, at 78.

⁷⁴ *Ibid.*, at 78.

⁷⁵ See C. Voigt, n. 36 above, at 174.

development is ‘more than a mere concept’ and that it is ‘a principle with normative value’.⁷⁶ For him, the principle of sustainable development is ‘a part of modern international law by reason not only of its inescapable logical necessity, but also by reason of its wide and general acceptance by the global community’.⁷⁷

In the *Iron Rhine* case, the Permanent Court of Arbitration (PCA) recognized this duty to reconcile economic development with environmental protection as ‘a principle of general international law’.⁷⁸ The PCA noted, with particular reference to Rio Principle 4, which integrates environmental protection into the development process, that ‘[e]nvironmental law and the law on development stand not as alternatives but as mutually reinforcing, integral concepts’.⁷⁹ In other words, ‘where development may cause significant harm to the environment, there is a duty to prevent, or at least mitigate, such harm’.⁸⁰

In the *Pulp Mills* case, the ICJ reaffirmed that ‘the balance between economic development and environmental protection ... is the essence of sustainable development’.⁸¹ In the specific context of the case in question, the ICJ recognized ‘the need to strike a balance between the use of the waters and the protection of the river consistent with the objective of sustainable development’.⁸² The ICJ did not make an explicit acknowledgement of sustainable development as a general principle. However, Judge Cançado Trindade emphasized in his Separate Opinion that sustainable development has turned out to be ‘a general principle of International Environmental Law’.⁸³

Regardless of the exact legal status, it is reasonable to conclude that the concept of sustainable development has ‘practical legal consequences’.⁸⁴ The concept has been invoked by international courts and tribunals to modify the application of other norms.⁸⁵ It is a *de facto*

principle, whose relevance has been independent of the specific treaty formulation.⁸⁶ For example, it was applied in cases where the relations between the parties to a treaty did not deal with environmental issues.⁸⁷

How does this principle of sustainable development integrate the needs of development with the protection of the environment? Probably one of the most authoritative and detailed accounts on this question is contained in the above-mentioned Separate Opinion of Judge Weeramantry in the *Gabčíkovo-Nagymaros* case. As a principle, sustainable development recognizes both the right to development and the right to environmental protection as *equally* established rights under international law. Because they are equal, the ‘right [to development] does not exist in the absolute sense, but is relative always to its tolerance by the environment’.⁸⁸ In other words, development cannot be pursued to such a point as to result in significant or irreversible damage to the environment within which it is to occur. For sustainability, therefore, ‘development can only be prosecuted in harmony with the reasonable demands of environmental protection’.⁸⁹

In the Anthropocene,⁹⁰ that reasonable demand is respect for planetary boundaries.⁹¹ In essence, planetary boundaries define preconditions for human development: they estimate a ‘safe operating space for nine planetary systems’ that are fundamental to human existence.⁹² The exact positions of these boundaries are uncertain, dynamic and relative to each other as they interact in complex ways. Few scientists would contest, however, the existence of such thresholds in the functioning of the Earth system. Sustainable development as envisioned in the 2030 Agenda can only be achieved within the safe operating space defined by planetary boundaries.⁹³

⁷⁶ *Gabčíkovo-Nagymaros*, n. 33 above, at 85.

⁷⁷ *Ibid.*, at 95.

⁷⁸ Permanent Court of Arbitration 24 May 2005, *Arbitration Regarding the Iron Rhine* (‘Ijzeren Rijn’) *Railway between the Kingdom of Belgium and the Kingdom of the Netherlands*, Award (‘*Iron Rhine Arbitration*’), at 67.

⁷⁹ *Ibid.*

⁸⁰ *Ibid.*

⁸¹ ICJ 20 April 2010, *Pulp Mills on the River Uruguay (Argentina v. Uruguay)*, [2010] ICJ Rep. 14, at 75.

⁸² *Ibid.*, at 64.

⁸³ *Ibid.*, at 177; see also C. Voigt, n. 36 above.

⁸⁴ P. Sands and J. Peel, *Principles of International Environmental Law* (Cambridge University Press, 2012), at 10, discussing this in relation to the *Shrimp/Turtle* case. See WTO AB 6 November 1998, *United States – Import Prohibition of Certain Shrimp and Shrimp Products*, WT/DS58/AB/RM (‘*Shrimp/Turtle*’). See also P. Sands, ‘International Courts and the Application of the Concept of “Sustainable Development”’, 3 *Max Planck Yearbook of United Nations Law* (1999), 389.

⁸⁵ V. Lowe, ‘Sustainable Development and Unsustainable Arguments’, in: A. Boyle and D. Freestone (eds.), *International Law and Sustainable Development: Past Achievements and Future Challenges* (1999), 19, at 36–37.

⁸⁶ See C. Voigt, n. 36 above.

⁸⁷ See, e.g., *Iron Rhine Arbitration*, n. 78 above.

⁸⁸ *Gabčíkovo-Nagymaros*, n. 33 above, at 92.

⁸⁹ *Ibid.*

⁹⁰ On the concept of the Anthropocene, see generally W. Steffen, P.J. Crutzen and J.R. McNeill, ‘The Anthropocene: Are Humans Now Overwhelming the Great Forces of Nature?’, 36:8 *AMBIO* (2007), 614; W. Steffen *et al.*, ‘The Anthropocene: Conceptual and Historical Perspectives’, 369 *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences* (2011), 842.

⁹¹ Compelling scientific evidence now indicates that many Earth’s subsystems (e.g., the climate) react in a nonlinear way, and are particularly sensitive around threshold levels of certain control variables such as the atmospheric carbon dioxide concentration. Transgressing these so-called planetary boundaries will likely translate into irreversible and abrupt environmental change, leading to a state less conducive to human development. Therefore, for any kind of long-term human development, we must respect certain biophysical preconditions as ultimate limits to human conduct. See, e.g., J. Rockström *et al.*, ‘A Safe Operating Space for Humanity’, 461:7263 *Nature* (2009), 472; W. Steffen *et al.*, n. 52 above.

⁹² See J. Rockström *et al.*, n. 91 above, at 472.

⁹³ W. Steffen *et al.*, ‘The Anthropocene: From Global Change to Planetary Stewardship’, 40:7 *AMBIO* (2011), 739.

Sustainable development should not be mistaken for conferring automatic priority to the pursuit of purely environmental values. At the same time, sustainable development does not mean, and cannot be achieved by, giving equal weight to all rights and interests. As the economy and society are nested within Earth's ecosystem, the protection of the environment is 'a *sine qua non* for numerous human rights such as the right to health and the right to life itself'.⁹⁴ In that sense, the legal obligation to develop sustainably within ecological limits does not require a new ecocentric ethic, but is compatible with the anthropocentric ethic on which the 'people-centred' set of SDGs and targets are premised.⁹⁵ The deeper issues of equity and causation, which are not taken into account by the planetary boundary approach,⁹⁶ could be addressed through the application of distributive principles such as intragenerational equity, polluter pays and common but differentiated responsibilities.

APPLICATIONS TO THE SUSTAINABLE DEVELOPMENT GOALS

Can the concept of sustainable development as recognized in international law provide normative guidance as to how the SDGs and targets should be integrated? The usefulness of this concept as an 'arbiter' is examined below in different normative conflict scenarios.

'Prosperity' versus 'Planet'

The concept of sustainable development recognizes that, in order to meet the needs of the present and future generations, the planet must be protected from significant and irreversible environmental degradation, such as dangerous climate change. Therefore, in principle, prosperity should only be sought after to the extent that planetary boundaries can be respected. One proposal put forward by scientists was to design 'each goal [to] include an overall carbon intensity target so that implementing the goal did not undermine targets in the climate or other environmentally-related goals'.⁹⁷ In a more sophisticated proposal, a group of scholars proposed each goal to contain three types of hierarchically organized, biophysical, integrated and socioeconomic targets.⁹⁸ For an SDG on 'universal clean energy', for example, the following targets were proposed: a biophysical target of 'global emissions to peak 2015–2020 and fall 3–5% per year to reach 50–80% below 2000

emissions by 2050'; an integrated target of 'increase energy intensity by 2.4% per year [and] decrease carbon intensity by increasing the share of renewable energy to 30%'; and a social target to 'ensure universal access to affordable, reliable and modern energy services'.⁹⁹

The SDGs call for both sustained and sustainable economic growth and employment in Goal 8, but avoid any mention of planetary boundaries. Target 8.1 explicitly demands at least 7% gross domestic product (GDP) growth per annum (in the least developed countries). There is a close relationship between GDP growth and carbon dioxide (CO₂) emissions: CO₂ emissions is a function of carbon intensity (CO₂ released per unit energy) times energy intensity (energy use per unit of GDP) times GDP.¹⁰⁰ Goals 8 and 13 may therefore come into conflict. If a particular GDP trajectory with consequent energy use is to be maintained while restraining CO₂ emissions, a constrained trend in 'carbon intensity × energy intensity' must be achieved globally.¹⁰¹ The decoupling of economic growth and climate change through technological innovation, if successful, could satisfy the competing interests.¹⁰² But if 'carbon intensity × energy intensity' cannot be kept at a safe level due to the state of technology, the objective of sustainable development would dictate that the duty to reduce CO₂ emissions will be given overriding priority over the right to economic development. Economic growth in terms of GDP shall only be pursued to the extent that 'dangerous anthropogenic interference with the climate system' can be prevented.¹⁰³

While some SDG targets facilitate free trade,¹⁰⁴ not all free trade measures are environmentally benign. Reconciling the two competing interests can be complex and challenging as it was the case in the *Shrimp/Turtle* case.¹⁰⁵ The North American Free Trade Agreement (NAFTA), for example, allows the specific trade obligations set out in specified international environmental agreements to prevail to the extent of any inconsistency with NAFTA.¹⁰⁶ Although this provision is conditioned by the need to choose the least-trade-restrictive means of complying with such obligations,¹⁰⁷ the underlying

⁹⁴ Gabčíkovo-Nagymaros, n. 33 above, at 91.

⁹⁵ The 2030 Agenda, n. 1 above, at paragraph 2.

⁹⁶ See W. Steffen *et al.*, n. 52 above; W. Steffen and M. Stafford-Smith, 'Planetary Boundaries, Equity and Global Sustainability: Why Wealthy Countries Could Benefit from More Equity', 5:3–4 *Current Opinion in Environmental Sustainability* (2013), 1.

⁹⁷ See ICSU and ISSC, n. 6 above, at 10.

⁹⁸ See D. Griggs *et al.*, n. 7 above.

⁹⁹ *Ibid.*, at Figure 2.

¹⁰⁰ J. Rogelj, D.L. McCollum and K. Riahi, 'The UN's "Sustainable Energy for All" Initiative is Compatible with a Warming Limit of 2 °C', 3:6 *Nature Climate Change* (2013), 545.

¹⁰¹ See D. Griggs *et al.*, n. 7 above.

¹⁰² The 2030 Agenda, n. 1 above, target 8.4. See also J.D. Sachs, *The Age of Sustainable Development* (Columbia University Press, 2015).

¹⁰³ UNFCCC, n. 44 above, Article 2.

¹⁰⁴ The 2030 Agenda, n. 1 above, targets 2.b, 8.a, 10.a, 17.10, 17.11 and 17.12.

¹⁰⁵ *Shrimp/Turtle*, n. 84 above.

¹⁰⁶ North American Free Trade Agreement (17 December 1992; in force 1 January 1994), Article 104.1.

¹⁰⁷ *Ibid.* See also A. Rueda, 'Shrimp and Turtles: What about Environmental Embargoes under NAFTA?', in: E. Brown Weiss, J.H. Jackson and N. Bernasconi-Osterwalder (eds.), *Reconciling Environment and Trade*, 2nd edn (Martinus Nijhoff, 2008), 519.

idea is in line with the objective of sustainable development. The emerging principle of mutual supportiveness that demands synergistic implementation of international agreements in the field of trade and the environment should also be interpreted as to giving priority to protecting certain environmental thresholds.¹⁰⁸

‘People’ versus ‘Planet’

Increasing agricultural land use and productivity to help end hunger (Goal 2) may lead to the overuse or pollution of freshwater (Goal 6). This is especially so when the progress towards Goal 2 is partly measured by the ‘[p]ercentage of agricultural households using irrigation systems compared to all agricultural households’.¹⁰⁹ Irrigation is indeed helpful to increase agricultural productivity, but irrigated agriculture accounts for 92% of the total withdrawals of ‘blue water’ from rivers, lakes and groundwater,¹¹⁰ totalling some 2,000 km³ per year consumptive use, which is half the proposed planetary boundary for sustainable freshwater use.¹¹¹ In order to feed everyone in the world on current practices, estimates show that the blue water use will have to substantially increase to a dangerous level.¹¹² Thus, increases in global food demand imply a major water trade-off between irrigation requirements and freshwater needed to secure other ecosystem services.¹¹³

The use of best available technologies could in theory provide medium-term solutions for sustainable development. Agricultural production is a function of water productivity times water extracted.¹¹⁴ This means that, if we accept the proposed freshwater planetary boundary, and that the amount of blue water extracted must

not exceed 4,000 km³ per year, water productivity will need to improve by 9–29%, which is attainable with current technologies.¹¹⁵ In the longer term, however, such a technological approach may not be sustainable. A more fundamental socioeconomic reorganization might become necessary to enable a fairer (re)distribution of resources. There is enough accessible freshwater on the planet to meet the needs of the present world population, but the issue is the highly uneven distribution of water.¹¹⁶ Similarly, the use of phosphorus to intensify food production is uneven. The management of phosphorus use by redistributing it from excess to deficit regions may address food security and environmental sustainability at the same time.¹¹⁷

‘Planet’ versus ‘Planet’

Measures taken to protect one part of the environment may have unintended consequences on other parts of the environment. For example, preventing the dumping of radioactive wastes at sea under the London Convention¹¹⁸ reduces pressure on the marine environment, but may increase the pressure on terrestrial ecosystems. This phenomenon has been captured under different concepts such as environmental problem shifting,¹¹⁹ cross-media pollution,¹²⁰ pollution transfer or transformation,¹²¹ negative spillover¹²² and, in the context of climate change mitigation, carbon leakage.¹²³ To the extent that the transfer involves transboundary

¹⁰⁸ An example is found in the preamble of the Stockholm Convention on Persistent Organic Pollutants (Stockholm, 22 May 2001; in force 17 May 2004). For general discussions on the concept of mutual supportiveness, see, e.g., M. Sanwal, ‘Trends in Global Environmental Governance: The Emergence of a Mutual Supportiveness Approach to Achieve Sustainable Development’, 4:4 *Global Environmental Politics* (2004), 16; R. Pavoni, ‘Mutual Supportiveness as a Principle of Interpretation and Law-making: A Watershed for the “WTO-and-Competing-Regimes” Debate?’, 21:3 *European Journal of International Law* (2010), 649.

¹⁰⁹ See UN Department of Economic and Social Affairs Statistics Division, n. 59 above.

¹¹⁰ A.Y. Hoekstra and M.M. Mekonnen, ‘The Water Footprint of Humanity’, 109:9 *Proceedings of the National Academy of Sciences* (2012), 3232. On the concept of blue water, see, e.g., M. Falkenmark, ‘Meeting Water Requirements of an Expanding World Population’, 352 *Philosophical Transactions of the Royal Society B: Biological Sciences* (1997), 929.

¹¹¹ See W. Steffen *et al.*, n. 52 above.

¹¹² M. Falkenmark, J. Rockström and L. Karlberg, ‘Present and Future Water Requirements for Feeding Humanity’, 1:1 *Food Security* (2009), 59. See also International Assessment of Agricultural Knowledge, Science, and Technology for Development, *Agriculture at a Crossroads: The Global Report* (Island Press, 2008).

¹¹³ E.M. Bennett, G.D. Peterson and L.J. Gordon, ‘Understanding Relationships among Multiple Ecosystem Services’, 12:12 *Ecology Letters* (2009), 1394.

¹¹⁴ See D. Griggs *et al.*, n. 7 above.

¹¹⁵ D. Molden, *Water for Food, Water for Life: A Comprehensive Assessment of Water Management in Agriculture* (Earthscan, 2007).

¹¹⁶ O.R. Young *et al.*, ‘Goal-setting in the Anthropocene: The Ultimate Challenge of Planetary Stewardship’, in: N. Kanie and F. Biermann, n. 4 above.

¹¹⁷ See D. Griggs *et al.*, n. 7 above.

¹¹⁸ Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London, 13 November 1972; in force 30 August 1975).

¹¹⁹ R.E. Kim and H. van Asselt, ‘Dealing with Environmental Problem Shifting in the Anthropocene: The Limits of International Law’, in: E. Morgera and K. Kulovesi (eds.), *Research Handbook on International Law and Natural Resources* (Edward Elgar, 2016, forthcoming). See also Y. Yang *et al.*, ‘Replacing Gasoline with Corn Ethanol Results in Significant Environmental Problem-shifting’, 46:7 *Environmental Science and Technology* (2012), 3671; J. van den Bergh *et al.*, ‘What if Solar Energy Becomes Really Cheap? A Thought Experiment on Environmental Problem Shifting’, 14 *Current Opinion in Environmental Sustainability* (2015), 170.

¹²⁰ J. Lowe, D. Lewis and M. Atkins, *Total Environmental Control: The Economics of Cross-media Pollution Transfers* (Pergamon Press, 1982); G.E. Metcalf, D.J. Dudek and C.E. Willis, ‘Cross-media Transfers of Hazardous Wastes’, 13:2 *Northeastern Journal of Agricultural and Resource Economics* (1984), 203; L.A. Teclaff and E. Teclaff, ‘International Control of Cross-media Pollution – An Ecosystem Approach’, 27:1 *Natural Resources Journal* (1987), 21; L. Fernandez and C.F. Dumas, ‘Cross-media Pollution and Fuels – Can We Avoid Future MTBEs?’, 31:3 *Energy Economics* (2009), 423.

¹²¹ L.A. Teclaff and E. Teclaff, ‘Transfers of Pollution and the Marine Environment Conventions’, 31:1 *Natural Resources Journal* (1991), 187.

¹²² H.B. Truelove *et al.*, ‘Positive and Negative Spillover of Pro-environmental Behavior: An Integrative Review and Theoretical Framework’, 29 *Global Environmental Change* (2014), 127.

¹²³ M.H. Babiker, ‘Climate Change Policy, Market Structure, and Carbon Leakage’, 65:2 *Journal of International Economics* (2005), 421.

damage, the well-recognized customary international law principle of ‘no-harm’ can come into effect.¹²⁴ But many placeless cross-sectoral harms have not been accounted for.

Certain geoengineering measures, such as ocean fertilization and CO₂ sequestration in sub-seabed geological formations designed to mitigate climate change (Goal 13) or ocean acidification (Goal 14), may seriously harm marine ecosystems (Goal 14).¹²⁵ While the Convention on Biological Diversity (CBD) issued a ‘moratorium’ on ocean fertilization,¹²⁶ the London Protocol¹²⁷ and the Convention for the Protection of the Marine Environment of the North-east Atlantic¹²⁸ have begun regulating certain marine geoengineering activities including ocean fertilization and carbon capture and storage.¹²⁹ Although no-transfer clauses such as UNCLOS Article 195 and the London Protocol Article 3.3 are applicable, they are of limited effectiveness due to their ambiguity.¹³⁰ The CBD Article 22.1, which, in addition to the conventional conflict clause, includes a ‘reverse conflict clause’ where it is declared that if ‘the exercise of [the] rights and obligations [of a contracting party deriving from an existing international agreement] would cause a serious damage or threat to biological diversity’, then the provisions of the CBD may have an effect.¹³¹ This enables the parties to determine the circumstances in

which the CBD should take precedence over other international agreements.¹³² However, Article 22.1 is of little practical value because the implementation depends on the circumstances of a particular case and how ‘serious damage or threat’ is interpreted by the parties.¹³³

At a more fundamental level, a key challenge is how to address a normative conflict between environmental issues of equal priority, such as climate change and biodiversity loss.¹³⁴ They are both legally recognized as common concerns of humanity under the respective treaties,¹³⁵ and scientifically understood as highly integrated ‘core planetary boundaries through which the other boundaries operate’.¹³⁶ Yet there are instances where measures implemented in pursuit of the objective of the UNFCCC pose a considerable risk to the objectives of the CBD.¹³⁷ Some trade-offs are inevitable due to the inherent complexity of the interlinkages.¹³⁸ What needs to be clarified in this regard is whether some degree of environmental problem shifting should be allowed if the overall health and integrity of Earth’s ecosystem can be improved. From the perspective of sustainable development, the answer is probably yes.¹³⁹ This would in turn call attention to the overall effectiveness of international environmental agreements, the performance of which would be evaluated in relation to an overall environmental goal or what some call a sustainability *grundnorm*.¹⁴⁰

¹²⁴ Declaration of the United Nations Conference on the Human Environment (UN Doc. A/CONF.48/14/Rev. 1, 16 June 1972), Principle 21. See also D.B. Magraw, ‘Transboundary Harm: The International Law Commission’s Study of “International Liability”’, 80:2 *American Journal of International Law* (1986), 305; X. Hanqin, *Transboundary Damage in International Law* (Cambridge University Press, 2003); R.M. Bratspies and R.A. Miller (eds.), *Transboundary Harm in International Law* (Cambridge University Press, 2006).

¹²⁵ See, e.g., P. Williamson *et al.*, ‘Ocean Fertilization for Geoengineering: A Review of Effectiveness, Environmental Impacts and Emerging Governance’, 90:6 *Process Safety and Environmental Protection* (2012), 475; L. Cao and K. Caldeira, ‘Can Ocean Iron Fertilization Mitigate Ocean Acidification?’, 99:1 *Climatic Change* (2010), 303; K. Caldeira and P.B. Duffy, ‘The Role of the Southern Ocean in Uptake and Storage of Anthropogenic Carbon Dioxide’, 287:5453 *Science* (2000), 620.

¹²⁶ Decision IX/16, Biodiversity and Climate Change (UN Doc. UNEP/CBD/COP/DEC/IX/16, 9 October 2008), at Section C.

¹²⁷ 1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972 (London, 7 November 1996; in force 24 March 2006).

¹²⁸ Convention for the Protection of the Marine Environment of the North-east Atlantic (Paris, 22 September 1992; in force 25 March 1998).

¹²⁹ Resolution LP.1(1), On the Amendment to Include CO₂ Sequestration in Sub-seabed Geological Formations in Annex 1 to the London Protocol (IMO Doc. LC 28/15, 6 December 2006); Decision 2007/2, OSPAR Decision 2007/2 on the Storage of Carbon Dioxide Streams in Geological Formations (OSPAR 07/24/1-E, Annex 6 (Ref. §2.10c), 25–29 June 2007); Resolution LP.4(8), On the Amendment to the London Protocol to Regulate the Placement of Matter for Ocean Fertilization and Other Marine Geoengineering Activities (IM Doc. LC 35/15, 18 October 2013).

¹³⁰ See R.E. Kim and H. van Asselt, n. 119 above.

¹³¹ See, e.g., E. Morgera, ‘Faraway, So Close: A Legal Analysis of the Increasing Interactions between the Convention on Biological Diversity and Climate Change Law’, 2:1 *Climate Law* (2011), 85, at 88.

¹³² *Ibid.* See also R. Wolfrum and N. Matz, ‘The Interplay of the United Nations Convention on the Law of the Sea and the Convention on Biological Diversity’, 4 *Max Planck Yearbook of United Nations Law* (2000), 445.

¹³³ See, e.g., M. Doelle, ‘Linking the Kyoto Protocol and Other Multilateral Environmental Agreements: From Fragmentation to Integration?’, 14 *Journal of Environmental Law and Practice* (2004), 75.

¹³⁴ Secretariat of the CBD, *Global Biodiversity Outlook 3* (Secretariat of the CBD, 2010), at 11.

¹³⁵ CBD, n. 48 above, at preamble; UNFCCC, n. 44, at preamble.

¹³⁶ See W. Steffen *et al.*, n. 52 above, at 8.

¹³⁷ See, e.g., M. Totten, S.I. Pandya and T. Janson-Smith, ‘Biodiversity, Climate, and the Kyoto Protocol: Risks and Opportunities’, 1:5 *Frontiers in Ecology and the Environment* (2003), 262.

¹³⁸ P.D. Hirsch *et al.*, ‘Acknowledging Conservation Trade-offs and Embracing Complexity’, 25:2 *Conservation Biology* (2011), 259.

¹³⁹ A. Steiner, L.A. Kimball and J. Scanlon, ‘Global Governance for the Environment and the Role of Multilateral Environmental Agreements in Conservation’, 37:2 *Oryx* (2003), 227; A. Jóhannsdóttir, I. Cresswell and P. Bridgewater, ‘The Current Framework for International Governance of Biodiversity: Is it Doing More Harm Than Good?’, 19:2 *Review of European Community and International Environmental Law* (2010), 139. See also R.E. Kim and K. Bosselmann, n. 53 above.

¹⁴⁰ On the concept of *grundnorm* in the environmental law context, see, e.g., D.E. Fisher, *Legal Reasoning in Environmental Law: A Study of Structure, Form and Language* (Edward Elgar, 2013); K. Bosselmann, ‘Grounding the Rule of Law’, in: H.C. Bugge and C. Voigt (eds.), *Rule of Law for Nature: Basic Issues and New Developments in Environmental Law* (Cambridge University Press, 2013), 75; K. Bosselmann, *Earth Governance: Trusteeship of the Global Commons* (Edward Elgar, 2015); R.E. Kim and K. Bosselmann, ‘Operationalizing Sustainable Development: Ecological Integrity as a *Grundnorm* of International Law’, 24:2 *Review of European, Comparative and International Environmental Law* (2015), 194. See also A. Underdal and R.E. Kim, n. 37 above; R.E. Kim and K. Bosselmann, n. 53 above; O.R. Young *et al.*, n. 116 above.

SUSTAINABLE DEVELOPMENT BEYOND 2030

The sustainability *grundnorm* would encapsulate a clearly defined and globally accepted vision for long-term sustainable development *beyond* 2030. At the core of such a vision is the duty of States and non-State actors to 'conserve, protect and restore the health and integrity of the Earth's ecosystem'.¹⁴¹ It demands absolute respect for planetary 'must-haves' that are fundamental for the welfare of people,¹⁴² while allowing a degree of flexibility as to how exactly to balance the needs of the present and future generations. This *grundnorm* is arguably emerging through the repeated and consistent references in international environmental law.¹⁴³

The HLPF as the key orchestrator of the SDGs should clarify an overarching goal in light of this *grundnorm*. One way to go about it is to initiate a global dialogue through which an updated definition of sustainable development would eventuate. The oft-quoted Brundtland version allows for various interpretations of what sustainable development might mean, hence rendering itself practically useless, especially in relation to integrating the economic, social and environmental objectives.¹⁴⁴ Scientists have proposed a number of alternative definitions based on planetary boundaries science such as 'development that does not degrade the biosphere'¹⁴⁵ and 'development that meets the needs of the present while safeguarding Earth's life-support system, on which the welfare of current and future generations depends'.¹⁴⁶

¹⁴¹ Rio Declaration, n. 10 above, Principle 7. What the integrity of the Earth's ecosystem will mean in the Anthropocene remains a subject of debate, but it can be understood as the combination of the biodiversity and ecosystem processes that characterized the biosphere as a whole during the Holocene. P. Bridgewater, R.E. Kim and K. Bosselmann, 'Ecological Integrity: A Relevant Concept for International Environmental Law in the Anthropocene?', *Yearbook of International Environmental Law* (2016, forthcoming). The Holocene provides an appropriate precautionary reference point because it is the only state of the Earth system that is known to support contemporary society. See W. Steffen *et al.*, n. 93 above.

¹⁴² D. Griggs *et al.*, 'Sustainable Development Goals for People and Planet', 495:7441 *Nature* (2013), 305.

¹⁴³ See, e.g., P. Bridgewater *et al.*, n. 141 above. The latest addition includes the reference to 'the integrity of all ecosystems' in the preamble of the Paris Agreement. Decision 1/CP.21, n. 42 above.

¹⁴⁴ See, e.g., K. Bosselmann, 'The Concept of Sustainable Development', in: K. Bosselmann and D. Grinlinton (eds.), *Environmental Law for a Sustainable Society* (New Zealand Centre for Environmental Law, 2002), 81.

¹⁴⁵ B. Muys, 'Sustainable Development within Planetary Boundaries: A Functional Revision of the Definition Based on the Thermodynamics of Complex Social-Ecological Systems', 1:1 *Challenges in Sustainability* (2013), 41, at 45.

¹⁴⁶ See D. Griggs *et al.*, n. 142 above, at 306. For a commentary on this definition, see R.E. Kim and K. Bosselmann, n. 140 above, at 199–200.

Once the meaning of sustainable development has been revised and updated for the Anthropocene, the overall progress towards this overarching objective should be measured and monitored.¹⁴⁷ The dominant metric for measuring progress has so far been GDP. It has been widely used in many other composite indicators as a measure of quality of life. For example, the Human Development Index (HDI) is calculated based on GDP, adult literacy and life expectancy.¹⁴⁸ Some have proposed to revise the HDI by adding an environmental dimension,¹⁴⁹ but the resulting Human Sustainable Development Index remains insufficient in its representation of environmental sustainability.¹⁵⁰ Fundamentally, the persistent reliance on GDP is ill-advised. GDP is dangerously inadequate as it 'measures mainly market transactions [while] ignoring social costs, environmental impacts and income inequality'.¹⁵¹ There are alternatives that adjust economic measures to reflect social and environmental factors, including the genuine progress indicator (GPI), according to which, global economic welfare has actually decreased since 1978.¹⁵² Some more experimental attempts have been made to build a composite measure based on both subjective and objective indicators, such as the Happy Planet Index, which multiplies experienced well-being by life expectancy and divides the product by ecological footprint.¹⁵³ These attempts constitute important building blocks for a successor to GDP that better measures progress towards an overarching goal for the SDGs or, as some put it, 'a prosperous, high quality of life that is equitably shared and sustainable'.¹⁵⁴

CONCLUSION

Integration and long-term vision are two core themes of sustainable development. While the SDGs are proclaimed to be integrated and indivisible, their targets were derived from existing intergovernmental commitments without a clear long-term vision that stretches beyond 2030. The lack of coherence and vision in the SDG framework creates a significant implementation

¹⁴⁷ L. Pintér, M. Kok and D. Almassy, 'The Measurement of Progress in Achieving the Sustainable Development Goals', in: N. Kanie and F. Biermann, n. 4 above.

¹⁴⁸ United Nations Development Programme, *Human Development Report 1990* (Oxford University Press, 1990).

¹⁴⁹ C. Togtokh, 'Time to Stop Celebrating the Polluters', 479:7373 *Nature* (2011), 269.

¹⁵⁰ G. Bravo, 'The Human Sustainable Development Index: New Calculations and a First Critical Analysis', 37 *Ecological Indicators* (2014), 145.

¹⁵¹ R. Costanza, 'Time to Leave GDP Behind', 505:7483 *Nature* (2014), 283, at 283. See also D. Philipsen, *The Little Big Number: How GDP Came to Rule the World and What to Do about It* (Princeton University Press, 2015).

¹⁵² I. Kubiszewski *et al.*, 'Beyond GDP: Measuring and Achieving Global Genuine Progress', 93 *Ecological Economics* (2013), 57.

¹⁵³ See <<http://www.happyplanetindex.org>>.

¹⁵⁴ See R. Costanza *et al.*, n. 40 above.

challenge. The problems that the goals and targets address and the solutions that they outline need to be evaluated in relation to an overarching goal. However, this goal has not been spelt out in the 2030 Agenda.¹⁵⁵ What we exactly want the SDGs to collectively and ultimately achieve is still an open question, and for that reason, we do not know how to measure the overall progress.

Yet, the SDGs do not operate in a normative vacuum. They are grounded in international law, which recognizes the objective of sustainable development. In the absence of an internal mechanism to address conflicts, the effectiveness of the SDGs depends substantially on the extent to which international law is accepted as their normative context. The concept of sustainable development as recognized in international law requires further clarification by international judicial bodies, but at its core, it means the protection of the global environment as a precondition for human development. Development must not cause significant and irreversible harm to the integrity of Earth's life-support system. As a way of harnessing the nexus of international law and the SDGs, the HLPF should re-

visit and update the definition of sustainable development and explicitly adopt the revised as its overarching goal.

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¹⁵⁵ See ICSU and ISSC, n. 6 above.