Health and international environmental law

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1. INTRODUCTION

Health and the environment are two areas that are inextricably linked; they cannot be viewed in isolation without serious consequences for humanity. International law has recognized this through the development of principles enshrined in numerous agreements and legal instruments to protect the environment from various threats. While many international environmental agreements on their face appear to respond to environmental concerns leaving health concerns to the periphery, the somewhat anthropocentric nature of international environmental law indicates that every initiative to protect the environment is ultimately driven by the protection of human health and well-being.

International law has recognized that the protection of the environment is fundamental for the benefit of present and future generations and for the overall health and survival of mankind. Health and the environment are interdependent and treating them as such is a key aspect of sustainable development in the twenty-first century as climate change forces intensify their effects globally.

Modern human activities have created widespread adverse environmental consequences that have led to health problems on a global scale that scientists and medical professionals are just starting to truly grasp. Diseases related to environmental changes are increasing at an alarming rate.

Fortunately, international environmental law is an area of international law that has exploded with a flurry of agreements and authoritative pronouncements in the last few decades of the twentieth century. This began with the 1972 Stockholm Conference that catalyzed the development of dozens of international agreements and legal instruments establishing regimes to protect the environment from various threats. This has led to the emergence of clear and enforceable principles that can serve the dual function of protection of human health and the environment.

This chapter will outline the link between health and the environment in international law that has been at the foundation of international environmental law's successful evolution into a strong and substantial set of principles. It will begin by briefly setting out how the environment impacts human health and well-being in various ways. It is important to recognize the way human health is impacted by environmental changes to ensure appropriate preventative and responsive environmental action when human health may be impaired, even when the link to the environment is not immediately obvious.

Section 3 will then examine the foundations of international environmental law to demonstrate that concern for human health and well-being lies at the heart of its development. This section will highlight how international environmental law has evolved to protect human health. It will conclude by setting out the most relevant environmental principles that have emerged to protect human health and the environment. These principles may serve as useful tools that may be developed and utilized to pursue public health objectives in the context of environmental measures.

Section 5 will highlight the way this fundamental link is applied and given effect in international law. It will accordingly highlight the specific provisions that protect human health and the environment to demonstrate the express role of human health in international environmental agreements. While these provisions that expressly enunciate the protection of human health in tandem with the protection of the environment are mainly contained in agreements related to pollution, climate change or noxious substances/wastes, the holistic and anthropocentric approach pursued in these instruments is based on the principles and approach that have evolved in this area of the law that will be set out in Section 4. These principles emerged as soft law and are now widely accepted as customary international law and are therefore generally binding on all states.

The principles that have developed in international environmental law to protect the environment may also be used to protect human health and well-being and therefore expand the space for public health concerns in international environmental law. They may also inspire global health law as an emerging discipline of public international law. They could serve as the foundation for international action to protect human health just as the way they have served as the foundation for the protection of the environment. Since human health and well-being are fundamentally dependent on the environment, there is ample space for international environmental law to serve as a conduit for public health goals. The trend in recent international environmental agreements has been to incorporate human health and public health policies into the substantive obligations, giving effect to

the link between health and the environment and taking steps to ensure that environmental damage does not harm human health.

2. THE LINK BETWEEN HEALTH AND THE ENVIRONMENT AS A NECESSITY FOR HUMANKIND

The environment is becoming increasingly responsible for poor health in many parts of the world, particularly in developing countries and among the poor and other vulnerable groups.[1] Unfortunately the environmental factors that result in tangible health problems may not be widely understood beyond those with technical expertise. It is important to ensure this understanding is more widespread to ensure that the technical expertise is not being exercised in isolation from the practical realities of the world that may be carrying out 'planned activities' without any thought or understanding of their effect on health or the environment.

The Conference of the Parties of the Convention on Biological Diversity adopted a decision on biodiversity and human health in 2016 that aptly captures the linkages between the environment and human health, which are perhaps most acute in the context of biodiversity.[2] 'Biodiversity' is the term used to combine 'biological' and 'diversity', and includes all varieties of life found on earth.[3] The decision recognizes that '[b]iodiversity gives rise to benefits for human health, including directly as a source of foods, nutrition, traditional medicines and biomedical discovery, and indirectly as a source of clean water, clothes,

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[1] Andronico O. Adede, William Onzivu and Yasmin von Schirnding, 'International Environmental Law and Global Public Health' (2002) 80(12) *Bulletin of the World Health Organization* 970; World Health Organization and Secretariat of the Convention on Biological Diversity, 'Connecting global priorities – biodiversity and human health, Key messages' (2015).

[2] Decision adopted by the Conference of the Parties to the Convention on Biological Diversity, 'XIII/6. Biodiversity and human health' 14 December 2016, CBD/COP/DEC/XIII/6.

[3] See Convention on Biological Diversity, 'What is biodiversity?', 2007, available from http://www.biodiv.be/biodiversity/about_biodiv/biodiv-what [accessed 29 September 2017] for further details; biological diversity is formally defined in Article 2 of the Convention on Biological Diversity as 'the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems'.

heating and shelter' and that 'biodiversity in urban environments contributes to a feeling of well-being by stimulating physical exercise, providing clean air, and improving mental well-being, among others'.[4]

The baseline health status of a community can be determined by the management of natural resources forming the many goods and services essential to all life on earth: biodiversity.[5] Not only do biodiversity and the environment in general benefit human health, they are a fundamental ingredient thereof.[6]

The World Health Organization (WHO) highlights that 'environmental health addresses the physical, chemical and biological factors external to a person, and all the related behaviors'.[7] The highest exposure to environmental hazards is associated with poverty, industrialization and rapid urbanization.[8] The WHO has recently undertaken a comprehensive study setting out 'a wide-ranging assessment and detailed findings to show by how much and in what ways improving the environment can promote health and well-being'.[9]

The findings of this WHO Report confirm that 23 per cent of global deaths and 26 per cent of deaths among children under five are due to modifiable environmental factors.[10] The most frequent serious medical issues caused by environmental factors are: stroke, ischemic heart disease, diarrhea and cancers.[11]

The WHO study indicates that the 'environmentally mediated disease burden' is far higher in developing countries, except for certain non-communicable diseases like cardiovascular diseases and cancers, where the per capita disease burden is higher in developed countries.[12] Of fundamental importance for the purposes of this chapter, the WHO report 'strongly supports the notion that the environment is a sound platform for good public, community and individual health', and notes that measures

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[4] Decision adopted by the Conference of the Parties to the Convention on Biological Diversity (n 2).

[5] World Health Organization and Secretariat of the Convention on Biological Diversity (n 1).

[6] Ibid.

[7] A. Pruss-Ustun, J. Wolf et al, 'Preventing Disease through Healthy Environments: A Global Assessment of the Burden of Disease from Environmental Risks' (2016) *World Health Organization* 3.

[8] Ibid.

[9] Ibid. at VII.

[10] Ibid. at VIII.

[11] Ibid.

[12] Ibid.

can be taken to immediately reduce the burden of disease attributable to environmental factors.[13]

Numerous studies and reports have indicated that children and the elderly are the most affected by environmental factors.[14] The environmental impact of diseases in children is most prominent, particularly infectious and parasitic diseases along with neonatal and nutritional diseases and injuries.[15] In the elderly, environmental causes of diseases are mainly related to non-communicable diseases and injuries.[16] The economic cost of air pollution related deaths in Europe alone is estimated to exceed $1.6 trillion a year.[17]

The diseases that are most impacted by the environment include respiratory infections, diarrheal diseases and cardiovascular diseases, driven primarily by air pollution along with water, sanitation and hygiene.[18] Diarrheal diseases are primarily caused by water contamination[19] and inadequate sanitation supplies, and are particularly rampant problems in Africa and Asia.[20] Air pollution is a problem in households in most developing countries where wood and charcoal are still primarily relied upon, which has adverse impacts on the health of the household,

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[13] Ibid.; see ibid. for a full overview of the measures that can be taken in this regard.

[14] Ibid. at XVII; see also the Medical Society Consortium on Climate and Health, 'Medical Alert! Climate Change Is Harming our Health', available from: https://medsocietiesforclimatehealth.org/wp-content/uploads/2017/03/medical_alert.pdf [last accessed on 11 June 2017] and William Onzivu, 'International Environmental Law, the Public's Health, and Domestic Environmental Governance in Developing Countries' (2005) 21(4) *AUILR* 602 for further details.

[15] Ibid.

[16] Ibid.

[17] World Health Organization and Secretariat of the Convention on Biological Diversity (n 1).

[18] Pruss-Ustun and Wolf et al (n 7), XX.

[19] Fresh water that would otherwise be safe for human consumption contaminated through land based marine pollution caused by untreated sewage and chemicals. Sewage and other microbes rich in nutrients breed microbes that may be fed into the food chain when consumed by fish, and then humans; see William Onzivu (n 14) for further details; generally, agricultural production, mining, industrial practices, forestry practices and domestic use may be the biggest threats to water quality and human health, see UN-Water, 'Water Quality' (2011) for general information on water quality.

[20] See ibid. and Pruss-Ustun, Wolf et al (n 7) for further details.

particularly children,[21] as well as adverse effects for the global environment. This adds to the obvious health impact of ambient air pollution and its consequent effect on respiratory illnesses. The use of chemicals has also been associated with numerous environmental and health problems.[22]

The WHO Report accordingly notes that '[a] change in perception to view the environment as an essential element of health protection, while adequately preserving it, would greatly benefit people's health'.[23] It also highlights the need to urgently tackle the most challenging risks that will face global populations in the coming decades in terms of health and the environment: climate change and the ecosystem change that follows it.[24]

2.1 Climate Change as a Threat to Human Health

The WHO, the United Nations Environment Programme and the World Meteorological Organization have undertaken an assessment of the risks and potential responses related to climate change and human health. They highlight that the 'global changes have heightened awareness that the long-term good health of populations depends on the continued stability and functioning of the biosphere's ecological, physical, and socio-economic systems'.[25] They also note that 'Climate and weather have always had a powerful impact on human health and well-being. But like other large natural systems, the global climate system is coming under pressure from human activities. Global climate change is, therefore, a newer challenge to ongoing efforts to protect human health.'[26]

The Ministerial Declaration on 'Health, Environment and Climate Change' of the Conference of the Parties to the United Nations Framework Convention on Climate Change[27] (the Ministerial Declaration) sets out some particularly important elements on the link between health, the environment, and climate change. Firstly, the '[m]inisters and high-level representatives, acknowledge that almost one quarter of the global burden

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[21] It is directly linked to the incidence of pneumonia which is one of the leading causes of death in children, see ibid. for further details.

[22] See Onzivu (n 14) 603.

[23] Pruss-Ustun, Wolf et al (n 7) XXI.

[24] Ibid.

[25] See World Health Organization, 'Climate Change and Human Health – Risks and Responses' (2003).

[26] Ibid.

[27] Twenty-second session of the Conference of the Parties to the UN Framework Convention on Climate Change (UNFCCC COP 22), 'Ministerial Declaration on "Health, Environment and Climate Change"' (Marrakech 2016).

of disease, and approximately 12.6 million deaths each year, are attributable to modifiable environmental factors'.[28]

The Ministerial Declaration further acknowledges that 'global, environmental and social changes, including climate change, are driving many of these risks, and impacting directly on human health'.[29] It nevertheless notes that despite the strengthening evidence of the effects that environmental and climate risk factors have on health, the political action and investment is not yet sufficiently scaled to address the global challenge, which contributes to rising healthcare costs around the world.[30] It accordingly recognizes the need to improve national health capabilities on prevention and treatment of illnesses related to the environment.[31]

Perhaps most importantly, the Ministerial Declaration recognizes that health gains represent 'an important opportunity for action' as one of the most prominent socially and economically valued benefits of environmental action to combat climate change.[32] It therefore sees public health as a strong motivating force to drive public support and political action for such measures. It highlights the clear references to the relationship between health, environmental degradation and climate change in the major environment and development frameworks, including the 2030 Agenda for Sustainable Development, the Paris Agreement and the UN Framework Convention on Climate Change.[33]

States have accordingly recognized that health gains are a fundamental value of environmental protection, and have expressed clear dedication to ensure that international law continues to pursue those gains. It is important to see that these high level government ministers have expressly acknowledged this link and taken action in the framework of international environmental law. It is also significant that they highlight health as an opportunity to motivate action.

The dangers of climate change on human health are already felt by doctors and health practitioners. While it is more widely known that developing countries are likely to be particularly vulnerable to climate change forces and the ill effects on human health,[34] it is striking that

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[28] Ibid.
[29] Ibid.
[30] Ibid.
[31] Ibid.
[32] Ibid.
[33] Ibid.
[34] See e.g., A. Haines, R.S. Kovats, D. Campbell-Lendrum and C. Corvalan, 'Climate Change and Public Health: Impacts, Vulnerability and Public Health' (2006) 120(7) *Public Health* 585; Anthony Costello, Mustafa Abbas, Adriana

medical professionals in the United States are already acutely aware of the increased health problems due to climate change. The Medical Society Consortium on Climate and Health recently issued a Medical Alert 'sounding the alarm that climate change poses a risk to the health of every American'.[35] The Medical Alert notes that 'physicians in medical societies representing over half of [doctors in the United States] see a need to share our growing understanding and concern about the health consequences of climate change with all Americans'.[36]

Climate change has a particularly acute impact on human health as the frequency of extreme weather and heat events increases and air pollution increases with direct consequences to health particularly through the spread of disease, threat to nutrition and mental health.[37] This is occurring across the globe regardless of economic standing. Climate change forces reduce air quality as heat increases smog, wildfires and pollen production, compounded by the burning of coal and other fossil fuels.[38] Around seven million people worldwide die prematurely due to lung and heart disease and cancer due to pollution.[39]

Climate change also makes water more vulnerable to contamination due to higher temperatures, heavier downpours, rising sea levels and flooding, which create conditions that can lead to contamination of recreational waters, fish, shellfish and drinking water, all of which can lead to human health problems.[40] Heavy rains and floods can cause fertilizers and waste from agriculture and farms to flush into lakes, rivers and other communal water sources. Once this drainage reaches communal freshwater sources, the excess nutrients and warm waters promote the growth of bacteria, parasites and algae like Salmonella, E. coli and cholera Vibrio.[41] This increases the occurrence of diarrheal and other bacterial diseases, and is a particular risk for children, elderly, individuals

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Allen et al, 'Managing the Health Effects of Climate Change' (2009) 373(9676) *The Lancet and UCL Institute for Global Health Commission* 1693 for a full overview of the scientific underpinnings on the adverse impact of climate change on human health, including the specific vulnerabilities of developing countries that seem inevitable.

35 Medical Alert! (n 14).
36 Ibid.
37 Ibid.
38 Ibid.
39 See ibid.
40 Ibid.
41 Ibid.

with weakened immune systems and the poor, particularly those dependent on fish and other water related activities.[42]

The greatest impact of climate change is on water resources, and is most acutely felt in the increased variability between droughts and floods.[43] These extreme weather events greatly impact farmers' ability to grow crops particularly when coupled with the increases in temperature and humidity that come with climate change.[44] Even in a successful season, these conditions can lead to the contamination of food through bacteria and toxins, particularly as flooding can spread fecal bacteria and viruses into fields where food is grown.[45] Doctors are apparently well aware that foodborne illnesses peak during the summer due to the heat, and expect an increase in such incidence as climate change forces further drive up global temperatures.[46]

Moreover, the impact of climate change goes far beyond the general parameters set out above and appears to accelerate each negative impact that environmental problems have on human health. Climate change forces thus are affecting and will continue to affect the health of the global population, regardless of geographic position or economic status. International law has recognized this and responded by elaborating principles to address, mitigate and prevent these environmental impacts from negatively affecting human health.

3. THE LINK BETWEEN HEALTH AND THE ENVIRONMENT AS A DRIVING FORCE OF INTERNATIONAL ENVIRONMENTAL LAW

International environmental law at its roots is founded in the protection of human health. The International Court of Justice (ICJ) has stressed

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[42] Ibid.

[43] See I. Niang, O.C. Ruppel and M.A. Abdrabo, 'Africa' in C.B. Field, V.R. Barros, D.J. Dokken et al (eds), *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge University Press 2014) for further information in this regard.

[44] Ibid.

[45] Ibid.

[46] Ibid.

'the great significance that it attaches to respect for the environment, not only for States but also for the whole of mankind',[47] and has reiterated that:

> the environment is not an abstraction but represents the living space, the quality of life and *the very health of human beings*, including generations unborn. The existence of the general obligation of States to ensure that activities within their jurisdiction and control respect the environment of other States or of areas beyond national control is now part of the corpus of international law relating to the environment.[48]

Judges of the ICJ have also noted the importance of ensuring that legal abstractions are not viewed apart from their practical impact on human life and the environment.[49] International environmental law has made significant strides starting in the 1970s and has now developed into binding principles that are elaborated in various agreements in specific contexts. These principles find their roots most firmly in international environmental law in the Stockholm Conference of 1972 and the Rio Declaration of 1992 along with its Agenda 21. Most of them have been confirmed as part of customary international law and are therefore binding on all states, while the precautionary principle will only be strictly binding between parties to the instruments that elaborate upon it.

The main corpus of international environmental law is referred to as 'principles' because they started off in soft law instruments like the Rio Declaration, and because it is a convenient way to categorize and understand the overarching obligations. Now the 'principles' have been included in numerous conventions and texts and several courts and tribunals have confirmed that they are part of customary international law and are binding on all states (except for the precautionary principle, though the recent trend in environmental treaties includes more binding language related to precaution). These norms and obligations are therefore referred to as principles and are generally applicable on all states as a part of customary international law.

This should be distinguished from general principles of law as a separate source of law within the meaning of Article 38 of the ICJ

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[47] *Gabcikovo-Nagymaros Project (Hungary/Slovakia)* Judgment, ICJ Reports 1997, 7, para. 53.

[48] *Request for an Examination of the Situation in Accordance with Paragraph 63 of the Court's Judgment of 20 December 1974 in the Nuclear Tests (New Zealand v. France) Case*, ICJ Reports 1995, para. 29, emphasis added.

[49] Dissenting Opinion of Judge Weeramantry in the *Nuclear Tests* case (n 48), 56–7.

Statute. These principles of international environmental law find their binding nature as a source of customary international law, and in the specific treaties that elaborate and bind states to implement them.[50]

This section will outline the origins of principles of international environmental law and their applicability. The following section will elaborate upon the content of the principles and their utility for public health goals. The final section will detail their specific application in relevant agreements.

These principles include: sovereignty over natural resources and the responsibility not to cause damage to the environment of areas beyond national jurisdiction; sustainable development; the precautionary principle; the principle of inter and intra generational equity; the principle of preventative action, and the corresponding obligation to conduct a transboundary environmental impact assessment. This is a non-exhaustive list but is intended to be illustrative of the principles of international environmental law that are rooted in the protection of human health and may be utilized to pursue public health objectives.[51]

3.1 The Stockholm Conference

The United Nations Conference on Human Environment held in Stockholm in 1972 (the Stockholm Conference) highlighted the continued strains and impairment to the environment and 'spearheaded the move toward more intensified international action based on the recognition of the health dimension of environmental issues'.[52] The Stockholm Declaration appears to be the primary foundation for the development and application of environmental principles and puts health at the forefront of the agenda for environmental protection. The preamble of the Declaration contains several elucidations on the relationship between humankind and

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[50] See Winfried Lang, 'UN-Principles and International Environmental Law' (1999) *Max Planck United Nations Year Book* for a further discussion of how soft law principles develop into binding obligations in customary law, particularly in the context of international environmental law.

[51] See Philippe Sands, Jacqueline Peel et al, *Principles of International Environmental Law* (Cambridge University Press 2012; first published 1995); Patricia Birnie, Alan Boyle and Catherine Redgwell, *International Law and the Environment* (Oxford University Press 2009) for a full overview of the principles of international environmental law more generally.

[52] Onzivu (n 14) 612.

the environment, and then sets out Principles that have formed the basis of international environmental law ever since.[53]

The Declaration notes in its preamble that the protection and improvement of the 'human environment' is a fundamental issue that affects all people of the world, and that it is the duty of all governments and the urgent desire of all people.[54] The preamble further highlights the link between humankind and the environment, highlighting the way human activity has transformed the environment and that all aspects of 'man's environment' are essential to 'well-being and to the enjoyment of basic human rights including the right to life itself'.[55]

The Stockholm Declaration not only links human health to the protection and improvement of the environment, its preamble refers to the 'human environment' and 'man's environment', as though the environment only exists to benefit humankind. This appears to confirm that human health is inherently at the center of environmental concerns. Decent health is a fundamental ingredient of well-being. Principle 1 of the Declaration frames the text highlighting that humankind has the right to an environment that permits dignity and well-being.

By placing this as the very first principle with the opening words 'man has the right to …', it seems quite clear that humankind is the driving factor behind the principles espoused in the declaration, which in turn forms the basis of the principles of international environmental law.

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[53] See the Declaration of the United Nations Conference on the Human Environment, Report of the United Nations Conference on the Human Environment, Stockholm, 5–16 June 1972; some of the most relevant principles in relation to human health are the following:

Principle 2

The natural resources of the earth, including the air, water, land, flora and fauna and especially representative samples of natural ecosystems, must be safeguarded for the benefit of present and future generations through careful planning or management, as appropriate.

Principle 3

The capacity of the earth to produce vital renewable resources must be maintained and, wherever practicable, restored or improved.

Principle 7

States shall take all possible steps to prevent pollution of the seas by substances that are liable to create hazards to human health, to harm living resources and marine life, to damage amenities or to interfere with other legitimate uses of the sea.

[54] Ibid, preamble.

[55] Ibid.

The Stockholm Conference brought much needed global attention to the environment and the adverse impact on human health, and established the framework to address the issues through the elaboration of principles and the momentum to take effective action in the future. The Action Plan that emerged from the United Nations Water Conference in Mar del Plata, Argentina in 1977, followed suit by recognizing the link between human health and well-being, the sustainable management of natural resources, and economic conditions. Its preamble accordingly highlights that the development and administration of water resources is a key factor to improve economic and social conditions of all populations, especially in developing countries, and expressly links human dignity, happiness and quality of life to the administration of water resources.

3.2 The Rio Declaration of 1992

The momentum created by the Stockholm Conference culminated in 1992 in the United Nations Conference on Environment and Development (the 'Earth Summit'), held in Rio de Janeiro, which resulted in the adoption of the Rio Declaration on Environment and Development ('Rio Declaration') and Agenda 21, a global program of action on sustainable development. It also opened signature on two important conventions for the protection of health and the environment: the Convention on Biological Diversity and the Framework Convention on Climate Change.[56]

Principle 1 of the Rio Declaration provides that '[h]uman beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature.' Some commentators consider that this embodies a strong anthropocentric and utilitarian approach that strips the environment of any intrinsic value in and of itself.[57] It seems hard to argue against this representing an anthropocentric approach when it literally states that 'human beings are at the centre'.

Indeed, the environment serves many life forms beyond mankind and has intrinsic value with or without humankind. While the environment has intrinsic value in and of itself that compels protection, it is difficult to criticize the approach that serves to motivate public support and political action to protect the environment. So long as the goal of environmental protection is pursued, what is the harm of an anthropocentric nature of

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[56] See United Nations, 'Outcomes on Sustainable Development', available from http://www.un.org/en/development/devagenda/sustainable.shtml accessed September 2017.

[57] See Onzivu (n 14) for a further discussion of this point.

international environmental law if it compels states to act to protect the environment?

In any event Principle 1 of the Rio Declaration certainly places human health expressly at the forefront of environmental concerns and sustainable development itself, and lays down a 'sound foundation for the protection of public health in the realm of a global environmental agenda'.[58] While the Stockholm Conference demonstrated that human health is inherent to concerns for the environment, the Rio Declaration left no doubt that human health is expressly at the center of action to protect the environment.

The Rio Declaration was a milestone to set a new agenda for sustainable development[59] with human health at the forefront. Commentators from the WHO have noted that 'Agenda 21 and sustainable development have thus provided a platform whereby WHO can promote health through, inter alia, international environmental law'.[60] Sustainable development is a principle made up of interdependent and mutually reinforcing pillars: economic development, social development and environmental protection at the local, national, regional and global levels, which will be further elaborated below.[61]

Agenda 21 further elaborates the principles espoused in the Rio Declaration with recommendations for action. It states in its preamble that

> Humanity stands at a defining moment in history. We are confronted with a perpetuation of disparities between and within nations, a worsening of poverty, hunger, ill health and illiteracy, and the continuing deterioration of the ecosystems on which we depend for our wellbeing. However, integration of environment and development concerns and greater attention to them will lead to the fulfilment of basic needs, improved living standards for all, better protected and managed ecosystems and a safer, more prosperous future. No nation can achieve this on its own; but together we can – in a global partnership for sustainable development.

This is an apt expression of the principle of sustainable development and concerns. The wording even seems to confirm that human health and well-being is/are the motivation behind sustainable development itself,

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[58] Ibid., 614.

[59] Report of the World Summit on Sustainable Development, Johannesburg, South Africa, 26 August–4 September 2002, A/CONF.199/20.

[60] Pruss-Ustun, Wolf et al (n 7) 970.

[61] Report of the World Summit on Sustainable Development (n 59) para. 5.

and therefore why environment and development concerns must be integrated.

Agenda 21 confirms the place of health at the forefront of the environmental agenda by more than lip service, by requiring real action. It sets out the need to protect and promote human health emphasizing that primary health needs must be met, particularly in rural areas, in relation to the control of communicable diseases, protection of the health of the most vulnerable groups, notably the global poor, and addressing health challenges of increasing urbanization and rising health risks from environmental hazards and pollution.[62] It also encourages preventative efforts by reducing risks associated with environmental pollution and other hazards.[63] Accordingly, 'Agenda 21 and the Rio Declaration set the basis for integration of health in sustainable development, affirming that sustainable development maximizes human potential while protecting the environment but that if there is a conflict, human welfare must prevail.'[64] Health seems to have firmly become a target, source and indicator starting from the Rio Declaration.

3.3 Later Developments

The World Summit on Sustainable Development held in Johannesburg in 2002 reviewed the progress on the implementation of Agenda 21 and recommended means of strengthening its application along with the Rio Declaration. The Johannesburg Declaration on Sustainable Development identified health as one of the five key priorities in sustainable development.[65]

The United Nations Conference on Sustainable Development held in Rio de Janeiro in 2012 further reaffirmed the prominent role of health in sustainable development. The Conference recognized that 'health is a precondition for and an outcome and indicator of all three dimensions of sustainable development'.[66] The Conference devoted considerable

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[62] See Section I.6 of Agenda 21, and Onzivu (n 14) 612.

[63] Ibid.; see also Adede, Onzivu and von Schirnding (n 1) for further information.

[64] Onzivu (n 14) 614–15.

[65] See ibid. for further discussion.

[66] 'The future we want', the outcome document of the United Nations Conference on Sustainable Development, annexed to General Assembly resolution 66/288 of 27 July 2012.

attention to health and population concerns as goals and preconditions to the achievement of sustainable development.[67]

The General Assembly of the United Nations (UN) adopted the Sustainable Development Goals in 2015 that reconfirm the global commitment to combatting development issues over the next 15 years.[68] The introduction to the Declaration that emerged from the summit and contains the 17 sustainable development goals confirms health as one of the five primary objectives of sustainable development.[69] Human health remains a primary feature, goal and objective of sustainable development, confirmed by the fact that sustainable development goal three is to 'ensure healthy lives and promote well-being for all ages'.[70]

While the instruments that emerged from the conferences outlined above represent what is known as 'soft law' and do not contain strictly legally binding obligations, most of the principles espoused in the Rio Declaration building upon the Stockholm Conference and elaborated in the developments that followed have now been widely recognized and accepted as customary international law that is binding on all states. These pronouncements will be outlined in the following section.

4. THE PRINCIPLES OF INTERNATIONAL ENVIRONMENTAL LAW GROUNDED IN THE PROTECTION OF HUMAN HEALTH

Most environmental measures aimed at protecting human health or safety feature elements relating to the responsibility for the welfare of future generations relating to pollution, nuclear radiation risks and climate change.[71] Most experts in international environmental law may accordingly consider that health comes into play in the environment in relation to actions geared to regulate/eliminate pollution, radiation and climate change.

Nevertheless, the basic principles of international environmental law themselves are rooted in concerns for the protection of human health, and therefore health concerns permeate this entire area of law regardless of the number of environmental agreements that expressly include human

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[67] Ibid.

[68] See General Assembly resolution 70/1 of 25 September 2015, 'Transforming our world: the 2030 Agenda for Sustainable Development'.

[69] Ibid., para. 17.

[70] Ibid., Sustainable Development Goal Three.

[71] See Birnie, Boyle and Redgwell (n 51) 7 for further discussion.

health in their objectives. This seems to be confirmed by the Rio and Stockholm Conference and Rio Declaration that place human beings at the center of concerns for the environment.[72] This has also catalyzed the development of a new human right to a healthy or decent environment, which many assert is indispensable to the enjoyment of all other human rights and freedoms.[73]

The developments in international law related to health and the environment have influenced other international human rights laws as well.[74] A right to water has been developed in international human rights law either as a free standing right[75] or as an underlying precondition for the exercise of all other human rights.[76] General Comment 15 of the Committee on Economic, Social and Cultural Rights notes that the right to water is 'inextricably related to the right to the highest attainable standard of health and the rights to adequate housing and adequate food'.[77] Water may therefore be considered as the most tangible and visible link between health and the environment, crossing every facet of the globe and all life forms.

When it comes to human health and the environment, a holistic approach is fundamentally necessary considering the interdependence of humankind and the entire natural world. This interdependence is characteristically expressed in the notion of the word 'biosphere', which features prominently in the 1992 Conventions on Biological Diversity

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[72] With their confirmation that 'human beings are at the centre of concerns for sustainable development' and that 'man is both creature and moulder of his environment, which gives him physical sustenance and affords him the opportunity for intellectual, spiritual, moral and social growth' in the preamble of the Rio Declaration; see Birnie, Boyle and Redgwell (n 51) for a further discussion of this point.

[73] This is discussed further in Chapter 4 of this book on health and human rights; see also Birnie, Boyle and Redgwell (n 51) 7.

[74] Ibid., 158.

[75] General Assembly Resolution 64/292. The human right to water and sanitation. Adopted by the General Assembly on 28 July 2010, para. 1; Human Rights Council resolution 15/9 of 30 September 2010, Human rights and access to safe drinking water and sanitation, see Official Records of the General Assembly, sixty-fifth session, Supplement No. 53/A (A/65/53/Add.1).

[76] See Laurence Boisson de Chazournes, *Fresh Water in International Law* (Oxford University Press 2013).

[77] Committee on Economic, Social and Cultural Rights, 'General Comment No. 15, (2002); The right to water (arts. 11 and 12 of the International Covenant on Economic, Social and Cultural Rights)' (20 January 2003) (E/C.12/2002/11).

and the UN Framework Convention on Climate Change.[78] Although there is certainly room for improvement, the principles of environmental law that have emerged from Stockholm and Rio and exploded into a vast array of international agreements and legal instruments appear to reflect a holistic approach and provide for the protection of human health through environmentally sound practices.

This section will briefly set out the principles of international environmental law first elaborated during the processes set out above that are used to protect the environment to prevent adverse effects on human health.[79]

4.1 Sovereignty over Natural Resources and the Responsibility Not to Cause Damage to the Environment of Other States or to Areas beyond National Jurisdiction

The principles of international environmental law have generally developed within the context of two fundamental objectives that pull in opposite directions: that states have the sovereign rights over their natural resources but that they must not cause damage to the environment.[80] This is set out in Principle 21 of the Stockholm Declaration[81] which was reproduced as Principle 2 of the Rio Declaration, and remains 'the cornerstone of international environmental law'.[82]

This principle establishes the basic condition that underlies international environmental law and the source of its further elaboration in more specific rules and principles.[83] It plays a central role in environmental law and may generally provide a legal basis for bringing a claim under customary international law asserting liability for environmental damage,[84] and damage or threats to human health. The ICJ has confirmed

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[78] Birnie, Boyle and Redgwell (n 51).

[79] This section is not intended to set out a full analysis and overview of these principles, but is intended to highlight the principles that are relevant for the protection of human health for the purposes of further research in this area.

[80] Sands, Peel et al (n 51) 190–91.

[81] Principle 21 of the Stockholm Declaration provides that 'States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of its national jurisdiction'.

[82] Sands, Peel et al (n 51) 191.

[83] Ibid.

[84] Ibid., 200.

that this principle is a part of general customary international law that is binding on all states.[85] The principle nevertheless begs the question what may be considered 'damage' or 'harm' to the environment.[86]

The 2001 Articles on Transboundary Harm prepared by the International Law Commission (ILC) note that 'the harm must lead to a real detrimental effect on matters such as, for example, human health, industry, property, environment or agriculture in other states'.[87] These Articles are widely considered as a codification of customary international law, articulating existing obligations of an environmental impact assessment, notification, consultation, monitoring, prevention and diligent control of activities likely to cause transboundary harm.[88]

Human health is at the forefront of environmental law though it appears/slips through the back door by representing a threshold for the level of harm to the environment that may not be tolerated. Linking threat to human health in this manner is further reflected and confirmed in the obligation to conduct a transboundary environmental impact assessment, which will be discussed below. Some international environmental conventions may not expressly state that human beings are at the center of concerns for the environment in the way the Rio Declaration does. Nevertheless, all environment treaties seek to prevent harm to the environment, and the overwhelming majority of these conventions set the level of harm to the environment that may not be tolerated: when it may harm human health. Human health thus plays a vital role in all environmental agreements by establishing the normative baseline of human activities. Thus, though human health may not be explicit, it is inherent in nearly all activity to protect the environment.

4.2 Sustainable Development

The principle of sustainable development now regularly appears in international agreements in the environmental, economic and social

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[85] *Nuclear Tests* case (n 48), para. 29; this was also cited with approval in the *Iron Rhine* case (2005) at para. 222; see Sands, Peel et al (n 51) 199 for further elaboration.

[86] See ibid. for a full discussion.

[87] International Law Commission, Draft Articles on Prevention of Transboundary Harm from Hazardous Activities, text adopted by the International Law Commission at its fifty-third session, in 2001, and submitted to the General Assembly as a part of the Commission's report covering the work of that session (A/56/10); see Birnie, Boyle and Redgwell (n 51) 141–3 for an in-depth discussion of the ILC's work on this topic.

[88] See ibid.

spheres.[89] The substantive elements of the principles are mainly set out in Principles 3–8 of the Rio Declaration, though they are not expressly enunciated as the concept of sustainable development and include: the integration of environmental protection and economic development; the right to development; the sustainable utilization of natural resources; the equitable allocation of resources both within the present generation and between present and future generations (intra and inter-generational equity).[90]

Principle 4 of the Rio Declaration provides that 'environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it'. Principle 4 accordingly 'creates the possibility of moving environmental considerations and objectives from the periphery of international relations to the economic core, probably the most important long-term contribution that [the Rio Declaration] will make to international affairs'.[91]

The principle of sustainable development has been recognized as comprising obligations that are part of customary international law binding on all states.[92] The ICJ has stated that:

> Throughout the ages, mankind has, for economic or other reasons, constantly interfered with nature. In the past, this was often done without consideration of the effects upon the environment. Owing to new scientific insights *and to a growing awareness of the risks for mankind* – for present and future generations – of pursuit of such interventions at an unconsidered and unabated pace, new norms and standards have been developed [and] set forth in a great number of instruments during the last two decades. Such new norms have to be taken into consideration, and such new standards given proper weight, not only when States contemplate new activities, but also when continuing with activities begun in the past. This need to reconcile economic development with protection of the environment is aptly expressed in the concept of sustainable development.[93]

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[89] Sands, Peel et al (n 51) 206.

[90] Birnie, Boyle and Redgwell (n 51) 116.

[91] Philippe Sands, 'International Law in the Field of Sustainable Development (1995) 65 *BYIL* 324, quoted in Birnie, Boyle and Redgwell (n 51) 116.

[92] Sands, Peel et al (n 51) 208; see also Virginie Barral, 'Sustainable Development in International Law: Nature and Operation of an Evolutive Legal Norm' (2012) 23(2) *European JIL* for a thorough analysis of sustainable development and persuasive conclusion that sustainable development has crystallized as an obligation under customary international law.

[93] *Gabcikovo-Nagymaros Project (Hungary/Slovakia)* (n 47), para. 140 (emphasis added).

The ICJ has accordingly confirmed that the growing awareness of the risks for mankind associated with environmental damage has served as a catalyst driving the development of principles, standards and norms related to the environment.

Most commonly, the principle of sustainable development reflects a range of procedural and substantive commitments and obligations in recognition of: the requirement to consider the needs of present and future generations; the acceptance of limits on the use and exploitation of natural resources on environmental protection grounds; the role of equitable principles in the allocation of rights and obligations; the need to integrate all aspects of the environment and development and the need to apply and interpret the rules of international law in an 'integrated and systematic manner'.[94] It also provides a strong legal basis to assert global health objectives through international environmental law.

The Ministerial Declaration on 'Health, Environment and Climate Change' states that the 'protection and enhancement of health is an essential pillar of sustainable development, and of the response to climate change'.[95] The WHO and the Secretariat of the Convention on Biological Diversity consider that the Sustainable Development Goals and post-2015 development agenda set out by the UN General Assembly 'provide unique momentum and opportunity to develop coherent, coordinated, cross-sectoral action'.[96] Sustainable development may therefore represent the best umbrella under which human health concerns can be brought into all avenues of environmental and economic law. It accordingly provides an ideal framework to address health and environmental concerns and pursue health related objectives in the environmental field.

4.3 Prevention

The preventative approach has been outlined and endorsed by the Stockholm Declaration[97] and the Rio Declaration[98] in addition to numerous other agreements.[99] Like most principles in international environmental law, it first existed at the national level and was elevated into soft

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[94] See Sands, Peel et al (n 51) for further elaboration.
[95] UNFCCC COP 22 (n 27).
[96] WHO and Secretariat of the Convention on Biological Diversity (n 1).
[97] Principles 6, 7, 15, 18 and 24.
[98] Principle 1.
[99] See Sands, Peel et al (n 51) 200–202 for further elaboration.

law, and now forms part of customary international law and is elaborated in numerous treaties.[100]

There are two rules in relation to the principle of prevention that enjoy significant support in international environmental agreements, state practice, judicial decisions and the work of the ILC: 1. That states have a duty to prevent, reduce, and control transboundary pollution and environmental harm resulting from activities within their jurisdiction or control; and 2. States also have a duty to cooperate in mitigating transboundary environmental risks and emergencies through notification, consultation, negotiation and a transboundary environmental impact assessment.[101]

The principle of prevention accordingly requires the prevention of damage to the environment, or otherwise to reduce, limit or control activities that might risk or cause such damage.[102] Damage or harm once again bring health to the forefront as the threshold of the degree of damage or harm that is unacceptable—once it reaches the level of threat to human health. The ICJ has observed that 'the principle of prevention, as a customary rule, has its origins in the due diligence that is required of a State in its territory'.[103] The ICJ further underscored the interconnectedness between the principle of prevention and the requirement to exercise due diligence as 'an obligation which entails not only the adoption of appropriate rules and measures, but also a certain level of vigilance in their enforcement and the exercise of administrative control applicable to public and private operators, such as the monitoring of activities undertaken by such operators'.[104] These state obligations accordingly extend to the actions of private actors within the jurisdiction of a state.

The ICJ stated that 'the duty of prevention applies not only in autonomous activities but also in activities undertaken in implementation of specific treaties between the Parties'.[105] This was echoed by the arbitral tribunal in the *Iron Rhine* case. International environmental law accordingly requires states to exercise due diligence to prevent harm or damage to territory beyond its control by public or private actors, which

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[100] See Nicolas de Sadeleer, *Environmental Principles: From Political Slogans to Legal Rules* (Oxford University Press 2002) for further details on the origins in national law.

[101] Birnie, Boyle and Redgwell (n 51).

[102] Sands, Peel et al (n 51) 200.

[103] *Pulp Mills on the River Uruguay (Argentina v. Uruguay)*, Judgment, ICJ Reports 2010 (I), para. 101.

[104] Ibid., para. 197.

[105] *Gabcikovo-Nagymaros Project (Hungary/Slovakia)* (n 47), para. 140.

includes preventing harm that may[106] have a negative impact on human health. Some international legal instruments—albeit rare in practice—emphasize that 'health' dimension of the prevention principle by referring explicitly to human health in the formulation of the said principle. It is the case of the 2002 ASEAN Agreement on Transboundary Haze Pollution whose Article 3, paragraph 1, reads as follows:

> The Parties have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental and developmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment and *harm to human health* of other States or of areas beyond the limits of national jurisdiction.[107]

4.4 Precaution

The precautionary principle is the least developed principle in international environmental law.[108] Like most principles of international law, it emerged first at the national level but was elevated to the international arena later than the others in the late 1980s.[109] The precautionary principle kicks in to provide guidance in the development and application of international environmental law where there is scientific uncertainty.[110] It is not always formulated in the same manner in international environmental agreements, but the formulation in Principle 15 of the Rio Declaration is broadly supported.[111] Principle 15 provides that '[w]here there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation'.

The precautionary principle generally indicates that states must act carefully and with foresight when taking decisions that concern activities that might have an adverse impact on the environment. Adverse effects

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[106] See the following discussion of the precautionary principle to confirm that international environmental law allows measures to protect the environment and human health by implication even where there is no solid scientific evidence to conclusively establish that the activity will result in harm to the environment or human health.

[107] Article 3(1) of the ASEAN Agreement on Transboundary Haze Pollution.

[108] Sands, Peel et al (n 51), 217–18.

[109] Ibid.

[110] Ibid.

[111] Ibid.

on the environment are generally expressed in international environmental law as those that may damage human health or the environment, as indicated in the various definitions of 'harm', 'damage' and 'impact' in international agreements highlighted in Section 5. Though the threshold of harm may vary depending on the context, it is significant for the purposes of this chapter that environmental harm is directly linked to risks to human health. Even the Appellate Body of the World Trade Organization confirms that 'risk' in relation to the precautionary principle is the 'actual potential for adverse effects on human health in the real world where people live and work and die'.[112]

While the precautionary principle could be an effective tool to prevent adverse effects on human health through international environmental principles, it is the least settled area of the law and is the only principle outlined in this chapter that has not been endorsed by an international tribunal as part of customary international law that would bind all states.[113] The ITLOS Tribunal has nevertheless found a trend indicating that the precautionary principle may be crystallizing in customary international law.[114] This is promising for future environmental actions in the name of human health.

Some conventions, like the 2002 Protocol on Biosafety to the Convention on Biological Diversity, strongly entrench the precautionary approach to prevent harm to human health and the environment, while others clearly provide for its implementation, as will be set out in Section 5 below. The approach demonstrates the potential utility of environmental principles to require proactive action to mitigate and avoid risks to human health.

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[112] *EC Measures Concerning Meat and Meat Products*, WT/DS26/AB/R (1998) paras 179–86; see also Birnie, Boyle and Redgwell (n 51) 153; and Chapter 6 of this book on health and international trade law; the practice and jurisprudence of the WTO offers further insight on the protection of human health and the environment that will be explored in Chapter 6 of this book.

[113] See Sands, Peel et al (n 51), 217–28 and Birnie, Boyle and Redgwell (n 51) 152–64 for an in-depth discussion of the precautionary principle and its status in international law.

[114] Advisory Opinion of the Seabed Disputes Chamber of the International Tribunal for the Law of the Sea, Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area, 1 February 2011, para. 135.

4.5 The Obligation to Conduct a Transboundary Environmental Impact Assessment

A transboundary environmental impact assessment is a procedure for evaluating the likely impact and risks of a planned activity on the environment. It is fundamental to any system that seeks to identify and respond to environmental risks by providing decision-makers with information about possible environmental effects when deciding whether to authorize a planned activity.[115]

A transboundary environmental impact assessment is an extremely important tool of international law to assess and prevent harm to human health and the environment. The ICJ has recognized the obligation to conduct a transboundary environmental impact assessment as part of customary international law whenever a planned activity may cause transboundary harm.[116] It is therefore an obligation binding on all states.

The obligation to conduct a transboundary impact assessment is ultimately grounded in the principles elaborated above: to prevent harm to the environment; to ensure states act with foresight and precaution when taking decisions that could have an adverse impact on health and the environment; to ensure that activities do not cause transboundary environmental harm; all to fulfill the overarching aims of sustainable development. While grounded in these important principles, it is a fundamentally important tool to ensure the principles are given effect. It may serve as a further tool to open space and action to protect human health, as it can serve to highlight any concerns for human health related to planned economic activities.

The ITLOS Tribunal has confirmed that the obligations relating to an environmental impact assessment extend beyond the scope of the application of specific treaty provisions regulating particular areas and apply in any context where there may be transboundary effects of any activities.[117] The ICJ found that the requirement to undertake the assessment is linked to the risk that the proposed activity may have in a transboundary context, particularly on a shared water resource.[118]

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[115] See Birnie, Boyle and Redgwell (n 51) 167.

[116] See *Pulp Mills* case (n 103) para. 204.

[117] See Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area (n 100) para. 150.

[118] See *Pulp Mills* case (n 103) and J. De Mulder, 'Case Note: International Court of Justice Judgment on the Paper Mill Permit Dispute between Argentina and Uruguay Recognizes the Requirement of Environmental Impact Assessment

The ICJ described the requirement to apply the transboundary environmental impact as a duty of due diligence and vigilance, and considered that this duty would not be discharged if states did not undertake an environmental impact assessment on the potential effects of any planned activity.[119]

In addition to confirming the obligation, the ICJ has therefore affirmed that states may incur international responsibility when failing to undertake due diligence in their environmental impact assessment. It further confirmed that this obligation applies even when the planned activity is conducted by a private corporation but authorized by a public authority, and that it must be conducted before the implementation of the planned activity.[120]

The environmental impact assessment is accordingly an excellent opportunity to include human health concerns while an activity is being planned. Though it is a tool of environmental law, the 'impact' that is 'assessed' is generally the impact on human health and the environment. It is therefore a useful tool to pursue health objectives and ensure health concerns are adequately considered in relation to new activities. The African Commission on Human and Peoples' Rights has confirmed that the obligation to conduct an environmental impact assessment is a part of states' obligation to respect and facilitate the right to a general satisfactory environment.[121]

The Conference of the Parties to the Convention on Biological Diversity has recently recognized the valuable opportunity of the environmental impact assessment to expose and prevent health risks.[122] It has called on parties to consider health–biodiversity linkages in environmental impacts. The Convention on Biological Diversity will be highlighted in Section 5 below as it plays a particularly strong role demonstrating the link between health and the environment. It is an

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in a Transboundary Context' (2010) 19(2) *Review of European Community and International Environmental Law* 263.

[119] *Pulp Mills* case (n 103) para. 204.

[120] See ibid. and De Mulder (n 118) 268–9.

[121] *Social and Economic Rights Action Centre and Center for Economic and Social Rights v. Nigeria*, Afr. Comm'n Human and Peoples Rights. Comm. No. 155/96 (2002); Chapter 4 of this book dealt more generally with the link between human rights and health, that is ensured through the right to a healthy environment.

[122] Decision adopted by the Conference of the Parties to the Convention on Biological Diversity (n 2).

excellent example of how environmental norms and principles may be utilized to further public health objectives.

5. HOW INTERNATIONAL ENVIRONMENTAL LAW PROTECTS HEALTH IN PRACTICE

The principles discussed above form part of customary international law and are binding on all states, except for the precautionary principle, though recent trends indicate it is ripe for crystallization into customary international law. The principles are enunciated in dozens of international environmental agreements that regulate the conduct of states in certain areas, or regulate/restrict the use of certain substances. This section will set out a few that most clearly highlight the link between health and environment, which may also aid future development and application.[123]

This section is not intended to provide an extensive analysis of the operation of these conventions but is rather intended to demonstrate the strong role of human health in the agreements and highlight avenues to further pursue health related objectives through international environmental law.

5.1 The 1985 Vienna Convention for the Protection of the Ozone Layer

The Vienna Convention for the Protection of the Ozone Layer is a striking example of an international environmental agreement pursuing action to protect human health. The preamble of the Convention highlights 'the potentially harmful impact on human health and the environment through modification of the ozone layer' and expresses determination 'to protect human health and the environment against adverse effects resulting from modifications of the ozone layer'.

Like most of the international environmental agreements listed below, 'adverse effects' is defined as changes that have 'significant deleterious effects on human health' or ecosystems, 'or on materials useful to

[123] For a comprehensive overview of all international environmental agreements related to health, please see the searchable database provided by the International Environmental Agreements (IEA) Database Project and search the term 'health', available here: https://iea.uoregon.edu/full-text-search-with-text?inclusion=MEA&level2=&search_operator=AND&search_term_1=health.

mankind'.[124] This understanding of harm or damage is also reflected in the principles discussed in Section 4 above that form a part of customary international law and bind all states: that the level of harm that is unacceptable is that which causes damage to human health or the environment. This confirms the central role of human health in international environmental law.

This is further confirmed by Annex I of the Convention, which sets out obligations relating to the research and systematic observations of the Parties. This Annex confirms the major scientific issues at stake in the Convention and posits human health and 'materials useful to mankind' as major scientific issues in this area.[125] Annex I of the Convention thus further entrenches the central role of public health and mankind in general in international environmental law.

The Convention sets out the general obligations in this area in Article 2, and provides that 'Parties shall take appropriate measures … to protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer'.[126] To this end, the Parties are required to cooperate to understand and assess the effects on human health and the environment caused by human activities on the ozone layer.[127]

The Convention further reinforces the solid foundation of public health in this area of the law by requiring the Conference of the Parties to seek the services of the WHO in scientific research, observations and other activities pertinent to the objectives of the Convention.[128]

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[124] Article 1(2) of the Vienna Convention for the Protection of the Ozone Layer.

[125] Ibid., para. 1(b) of Annex I.

[126] Ibid., Article 2.

[127] Ibid., Article 2(2)(a).

[128] Article 6(4)(j) provides that the Conference of the Parties shall '[s]eek, where appropriate, the services of competent international bodies and scientific committees, in particular the World Meteorological Organization and the World Health Organization as well as the Co-ordinating Committee on the Ozone Layer, in scientific research, systematic observations and other activities pertinent to the objectives of this Convention, and make use as appropriate of information from these bodies and committees'.

5.2 The 1989 Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal

The 1989 Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal is another international environmental agreement with a particularly strong public health component. Its preamble puts human health at the forefront of the dangers of the transboundary movement and disposal of hazardous waste; human health is listed before the environment in every relevant preambular recital that seeks to protect human health and the environment.[129] The preamble highlights the risk of the transboundary movement of hazardous waste and corresponding need to act to manage such waste. It therefore lays the conditions for the transboundary movement in a manner that does not 'endanger human health and the environment'.[130] The preamble of the Basel Convention posits concern about human health as central to the activities regulated by the Convention.

The protection of human health is reiterated throughout the Convention in its various obligations. The Convention defines 'environmentally sound management of hazardous wastes or other wastes' as steps to ensure that management protects human health and the environment.[131] 'Environmentally sound management' may accordingly be understood as management that protects human health. This provides ample room to pursue public health objectives in this area.

The substantive obligations in the Convention are also framed in a way to pursue the objective of protecting human health. Article 4 sets out the general obligations, and requires states to take appropriate measures to ensure that the management of hazardous wastes is conducted in a manner to prevent pollution and manage any pollution that does occur in order to minimize the consequences for human health and the environment.[132]

The Convention further requires parties to highlight the effects on human health clearly in relation to any proposed transboundary movement of hazardous wastes.[133] It also foresees that states may consider

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[129] Preamble of the Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal 1989.

[130] Ibid.

[131] Ibid., Article 2(8).

[132] Article 4(2)(c) and (d) of the Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal 1989.

[133] Ibid., Article 4(2)(f).

imposing additional requirements to better protect human health.[134] The Convention accordingly greatly contributes to the pursuit of public health objectives in international environmental law by putting human health and the environment on equal footing in this area.

Finally, the Conference of the Parties of the Basel Convention and the Stockholm Convention on Persistent Organic Pollutants have highlighted the contribution of the respective conventions to the 'protection of human health and the environment from hazardous chemicals and wastes through the sound management of chemicals and wastes'.[135]

5.3 The 1991 Espoo Convention on Environmental Impact Assessment in a Transboundary Context

The 1991 Espoo Convention on Environmental Impact Assessment in a Transboundary Context defines 'impact' as used in this context as 'any effect caused by a proposed activity on the environment including human health …'.[136] Effect on the environment includes an effect on human health, demonstrating that when the environment is affected, so is human health.

The transboundary environmental impact assessment is essentially the teeth of the principle of prevention and implements the precautionary approach (ideally) in assessing risks of planned activities before they are undertaken so that adverse impacts on the environment including human health may be prevented. This in turn can contribute to and ensure sustainable development and can ensure that activities in one state do not harm the environment, and human health, in another. The obligation to conduct a transboundary impact assessment is a part of customary international law. This obligation may accordingly be a useful tool of environmental law to exercise precaution and prevent action that would impact human health. It serves as a valuable opportunity to highlight

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[134] Ibid., Article 4(11).

[135] See the identical language used in the separate reports of the Conference of the Parties of the Basel Convention and the Stockholm Convention; para. 3, BC-12/17: International cooperation and coordination, Report of the Conference of the Parties to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal on the work of its twelfth meeting, 13 August 2015, UNEP/CHW.12/27; and Report of the Conference of the Parties to the Stockholm Convention on the Persistent Organic Pollutants on the work of its seventh meeting, 23 June 2015, UNEP/POPS/COP.7/36.

[136] Article 1(vii) of the 1991 Espoo Convention on Environmental Impact Assessment in a Transboundary Context.

any health concerns related to a planned activity and ensure they are mitigated or addressed.

5.4 The 1992 United Nations Framework Convention on Climate Change

The 1992 United Nations Framework Convention on Climate Change (UNFCCC) is another environmental convention with a strong human health component. Once again, 'adverse effects of climate change' are defined as changes that result from climate change that have a detrimental impact on ecosystems or human health and welfare.[137]

The Convention further reinforces the holistic approach in international environmental law by referring to the 'climate system', in recognition of the totality of the systems making up the earth's climate, and their interactions.[138] This holistic view, supported by the central role that the environment plays in human health, is reflected and confirmed in the preamble of the Convention that expresses concerns for the concentration of greenhouse gases that may adversely affect 'natural ecosystems and mankind'.[139]

Climate change is one of the biggest threats to the environment and consequently the biggest threat to human health in environmental terms. The UNFCCC and subsequent agreements like the 2015 Paris Agreement are the global response to the threat of climate change understood holistically as a threat to human health and the environment and as an intrinsic value in and of itself.[140] This global holistic response seeks to: hold the increase in the global average temperature to well below two degrees above pre-industrial levels;[141] increase the ability to adapt to the adverse impacts of climate change; foster climate resilience; 'lower greenhouse gas emissions development, in a manner that does not

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[137] Article 1(1) of the United Nations Framework Convention on Climate Change.

[138] Article 1(3) defines 'Climate system' as 'the totality of the atmosphere, hydrosphere, biosphere and geosphere and their interactions'.

[139] Ibid., preamble.

[140] The preamble posits climate change as a common concern of humankind and highlights that all action to address climate change must respect human rights, including the right to health, the rights of indigenous peoples and the right to development, gender equality etc. and confirms the central role of humankind as a motivating factor to address climate change. The preamble also notes the intrinsic value of ensuring the integrity of all ecosystems and the protection of biodiversity in and of itself 'recognized by some cultures as Mother Earth'.

[141] See Article 2 of the Paris Agreement 2015.

threaten food production'[142] and enhance finance flows to ensure a pathway towards low greenhouse gas emissions and climate resilient development.

Although the Paris Agreement might have lost some efficacy when President Trump decided to withdraw the United States from its ambit, there is some hope in the dozens of mayors and business leaders in the United States who have pledged to nonetheless abide by the targets and principles in the agreements.[143] They will be the most important actors to have on board to ensure the Agreement has effect in any case.

The Ministerial Declaration of the Conference of the Parties of the UNFCCC on 'Health, Environment and Climate Change' recognizes the necessity of ongoing efforts to address health, environment and climate change linkages that will benefit from the active involvement of national governments, international organizations, 'environment and health organizations and other civil society groups' and other key actors including from the private sector. It recognizes that the outcome of the Second WHO Global Conference on Health and Climate that took place in Paris in July 2016 'significantly advanced the global effort on health and climate change, and highlighted a strong health community that is ready to implement the Paris Agreement'.[144] It seems that the health community could also make up for the lack of the United States in ensuring that the Paris Agreement is effective.

5.5 The 1992 Convention on Biological Diversity

The 1992 Convention on Biological Diversity and the Protocols that have emerged from it are further cogent examples of human health at the forefront of environmental protection. This Convention exemplifies the way health and environmental concerns converge in international environmental law. It represents one of the many reasons and examples of why humankind is a driving force behind this area of the law.

The preamble of the Convention on Biological Diversity essentially encapsulates the spirit of all the principles espoused in the Rio Declaration. It confirms the holistic approach in this area by referring to the

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[142] Article 2(1)(b) of the Paris Agreement 2015.

[143] See Daniel Twining, 'Making sense of Trump's climate surprise' (3 June 2017) *Nikkei Asian Review*, available from http://asia.nikkei.com/Viewpoints/Daniel-Twining/Making-sense-of-Trump-s-climate-surprise (last accessed June 2017).

[144] See UNFCCC COP 22 (n 27).

importance of biological diversity for 'maintaining life sustaining systems of the biosphere'. The Convention recognizes that the complex systems making up our environment are vital for human life, and demonstrates the inextricable link between health and the environment in international law that is at the forefront of most if not all agreements related to the environment (at least those that have emerged after the 1972 Stockholm Declarations).

The preamble expressly states that 'conservation and sustainable use of biological diversity is of critical importance for meeting the food, health and other needs of the growing world population …'. The Convention also acknowledges the intrinsic value of the environment itself in its preambular recitals, further reinforcing its holistic approach.

The preamble also expressly refers to the precautionary principle and ensures that lack of scientific knowledge does not prevent measures to avoid or minimize potential threats to biodiversity, human health and the environment. The preamble further reaffirms that 'the conservation of biological diversity is a common concern of humankind'. These provisions of the preamble color the interpretation and application of the Convention as a whole.

The Convention seeks to conserve and regulate biological diversity by requiring the sustainable use and fair and equitable sharing of the benefits arising from the utilization of genetic resources, in accordance with the principles reflected in the preamble above. The principles in the preamble may accordingly be relied upon to ensure their application throughout the life of the Convention.

It would not be necessary to rely on the preamble to find a firm legal basis to bring health considerations into this Convention, however. The Convention incorporates an obligation to establish and regulate risks associated with the use and release of living modified organisms resulting from biotechnology that are likely to have adverse environmental impacts that could risk human health.[145] This clause seems to typify an example of human interventions in the environment resulting in adverse consequences where human health is an express motivation in its regulation, management and control. Once again, it is risk to health that triggers environmental action.

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[145] Article 8 of the 1992 Convention on Biological Diversity.

5.6 2000 Cartagena Protocol on Biosafety to the Convention on Biological Diversity

The Cartagena Protocol on Biosafety was adopted in 2000 by the Conference of the Parties of the Convention on Biological Diversity. The introduction to the Protocol prepared by the Secretariat of the Convention on Biological Diversity states that:

> Biosafety … refers to the need to protect human health and the environment from the possible adverse effects of the products of modern biotechnology. At the same time, modern biotechnology is recognized as having a great potential for the promotion of human well-being, particularly in meeting critical needs for food, agriculture and health care. The Convention clearly recognizes these twin aspects of modern biotechnology. On the one hand, it provides for the access to and transfer of technologies, including biotechnology, that are relevant to the conservation and sustainable use of biological diversity (for example, in Article 16, paragraph 1, and Article 19, paragraphs 1 and 2). On the other hand, Articles 8(g) and 19, paragraph 3, seek to ensure the development of appropriate procedures to enhance the safety of biotechnology in the context of the Convention's overall goal of reducing all potential threats to biological diversity, taking also into account the risks to human health. Article 8(g) deals with measures that Parties should take at national level, while Article 19, paragraph 3, sets the stage for the development of an international legally binding instrument to address the issue of biosafety.[146]

The Protocol has been hailed for its express adoption of the precautionary approach within the substantive text.[147] Article 1 of the Protocol expressly adopts the precautionary approach, refers to Principle 15 of the Rio Declaration and highlights the risk to human health associated with the transfer and handling of living modified organisms resulting from modern biotechnology.

The preambular recitals of the Protocol further reinforce the central role of human health concerns. The primary concern of avoiding risk to human health is also reinforced within the substantive obligations of the Protocol. Article 2 of the Protocol contains the general provisions and requires that the handling, transport and use of living modified organisms

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[146] Secretariat of the Convention on Biological Diversity, Cartagena Protocol on Biosafety to the Convention on Biological Diversity: text and annexes, 2000.

[147] The precautionary approach contained in Principle 15 of the Rio Declaration is reaffirmed in the preamble and expressly referred to in Article 1, as well as Article 10(7) and 11(8); see Sands, Peel et al (n 51) 221 for a discussion of this point.

be done in a manner to prevent or reduce risks to human health (as well as risks to biological diversity).

The Protocol also requires risk assessments to be undertaken, and expressly requires that risks to human health must be considered in this process.[148] Risks to human health are expressly recalled in numerous provisions of the Protocol, wherever risks are to be considered. The Protocol accordingly has significantly enhanced the role of human health in international environmental law by requiring its express assessment at every stage.

The Protocol was invoked by the European Union in a dispute under the auspices of the World Trade Organization (WTO) as the basis of the EU's prohibition of genetically modified organisms on the EU market for health reasons.[149] The Panel did not allow the EU to rely on the Protocol as a basis because not all parties of the WTO are party to it.[150] This case nevertheless demonstrates the complex relationship in this area of the law, particularly when viewed through the lens of an international trade tribunal.

The recent decision on biodiversity and human health adopted by the Conference of the Parties to the Convention on Biological Diversity emphasizes the strong link between health and the environment.[151] It stresses the need to strengthen the capacity of health and environment ministries to 'address the health–biodiversity linkages to support preventative approaches to health and promote the multiple dimensions of health and well-being'.[152]

It further recognizes that biodiversity may be related to adverse health effects particularly through infectious agents, and notes that better consideration of health–biodiversity linkages 'could contribute to improving many aspects of human health, including nutrition, reducing the global burden of infectious as well as non-communicable diseases, and improving mental health and well-being'.[153]

This recent decision of the Conference of the Parties also acknowledges the link between health–biodiversity and the 2030 Agenda for

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[148] See ibid. Article 15; see also Article 16(2).

[149] *European Communities – Measures Affecting the Approval and Marketing of Biotech Products*, DS291; see Chapter 6 for a more in depth discussion of this case and the complex relationship between health and international trade law.

[150] Ibid.

[151] See Decision adopted by the Conference of the Parties to the Convention on Biological Diversity (n 2).

[152] Ibid., para. 4(h).

[153] Ibid., preamble.

Sustainable Development and the Sustainable Development Goals discussed in Section 3. It also calls for collaboration with the WHO to promote and implement the decision, including through wide dissemination of the Connecting Global Priorities: Biodiversity and Human Health, a State of Knowledge Review, which is endorsed in the decision of the Conference of the Parties. This further strengthens the platform of the WHO and others to pursue health related objectives through international environmental law.

5.7 The 1999 Protocol on Water and Health

Water is a particularly acute example of where environmental and health concerns converge and may be simultaneously protected by international environmental law. The Protocol on Water and Health[154] exemplifies this. It is the first international agreement specifically adopted to attain an adequate supply of drinking water and adequate sanitation for the sake of human health.[155] The Protocol is intended to complement the Convention on the Protection and Use of Transboundary Watercourses and International Lakes with 'further measures to strengthen the protection of public health'.[156]

The Protocol is based on the principles espoused in the Rio Declarations[157] and is an exemplary demonstration of the holistic approach whereby environmental, health and economic concerns converge and are each given effect to protect human health and further well-being through economic development.

The Protocol puts public health at the forefront. The preamble highlights the 'benefits to human health and well-being that accrue from wholesome and clean water and a harmonious and properly functioning water environment' and 'the consequences for public health of shortfalls

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[154] The 1999 Protocol on Water and Health to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes

[155] In order to improve water management to ensure adequate drinking water and sanitation, the Protocol requires Parties to establish local and national targets on the quality of drinking water and the quality of dischargers, and performance targets for water supply and waste, water treatment. It also calls for increased coordination between the economic and social fields, which is demonstrated by the fact that support for the implementation of the Protocol is entrusted to the WHO and the United Nations Economic Commission for Europe (UNECE).

[156] Preambular recital of the 1999 Protocol on Water and Health.

[157] Confirmed in the preamble of the 1999 Protocol on Water and Health.

of water in the quantities, and of the quality, sufficient to meet basic human needs'.[158]

The objective of the Protocol is to promote the protection of individual and collective human health and well-being within a framework of sustainable development through improving water management to protect water ecosystems and prevent, control and reduce water related diseases.[159] Article 5 of the Protocol lists the principles and approaches that shall guide the parties when taking measures to implement the Protocol, including the principles espoused above: the precautionary principle, the polluter pays principle, the right of states to exploit their own natural resources pursuant to national policies and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other states or to areas beyond the limits of their jurisdiction; intra and inter-generational equity; and preventative action.[160]

These principles ensure that the objectives of the protection of human health are given effect through the implementation of the Protocol and Convention more generally. Further, as demonstrated above, these principles now form part of customary international law so would be binding on any states in a transboundary context, irrespective of whether they are party to the Protocol or whether the situation would fall within the scope of the Protocol.

Other international legal instruments governing fresh water include express provisions prioritizing human needs and use over other activities.[161] These include the 1997 Convention on the Law of the Non-Navigational Uses of International Watercourses and the ILC's Draft Articles on the Law of Transboundary Aquifers 2008. Although these instruments do not enunciate a right to water, they promote water access and prioritize water use for vital human needs, meaning water needed to sustain a household and meet basic human needs including drinking, cooking and sanitary needs.[162]

The protection of vital human needs is also provided for in regional and river basin instruments that adopt the general principles of the above-mentioned conventions related to fresh water to the specific

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158 Ibid., preamble.

159 Ibid., Article 1.

160 Ibid., Article 5; it continues to list several other principles and approaches that guide Parties in the implementation of the Protocol.

161 Boisson de Chazournes (n 76) at 147.

162 See ibid. for further details.

regional or basin needs.[163] Some of the Water Charters governing these basins or regions even expressly refer to the right to water.[164]

International law governing fresh water as a subset of international environmental law accordingly offers further avenues to protect human health and well-being. These instruments will be even more important in the future as climate change forces further strain on freshwater resources with particularly adverse impacts on human health, as set out in Section 2.

5.8 2002 Stockholm Convention on Persistent Organic Pollutants

The Stockholm Convention on Persistent Organic Pollutants (POPs Convention) is another example of an international environmental agreement with a striking public health objective. Its preamble highlights 'the health concerns, especially in developing countries, resulting from local exposure to persistent organic pollutants, in particular impacts upon women and, through them, upon future generations'. The preamble further recalls decision 19/3 C of 7 February 1997 of the Governing Council of the UN Environment Programme to initiate international action to protect human health and the environment through measures that will reduce/eliminate emissions and discharges of persistent organic pollutants.

The POPs Convention clearly articulates its objective of protecting human health, which comes before the protection of the environment. Article 1 of the Convention sets out its objective: 'Mindful of the precautionary approach as set forth in Principle 15 of the Rio Declaration on Environment and Development, the objective of this Convention is to protect human health and the environment from persistent organic pollutants.' Human health is also placed as a concern and listed before the environment in the substantive body obligations of the Convention related to measures to reduce or eliminate releases from stockpiles and wastes.[165]

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[163] See ibid.

[164] See e.g. Article 13 of the Water Charter for the Lake Chad Basin; see also Makane Moise Mbengue and Susanna Waltman, 'Farmland Investments and Water Rights in Africa: The Legal Regimes at Stake' (2015) International Institute for Sustainable Development, for a full overview of the various regional and basin regimes governing fresh water.

[165] Article 6 of the 2002 Stockholm Convention on Persistent Organic Pollutants.

5.9 The 2013 Minamata Convention on Mercury

The 2013 Minamata Convention on Mercury (Minamata Convention) has a strong link to human health. It expresses this link in the preamble that highlights the 'health concerns, especially in developing countries, resulting from exposure to mercury of vulnerable populations, especially women, children, and, through them, future generations'.[166]

The Minamata Convention also strongly demonstrates the holistic approach in this area of the law. The preamble notes that 'mercury is a chemical of global concern owing to its long-range atmospheric transport, its persistence in the environment once anthropogenically introduced, its ability to bioaccumulate in ecosystems and its significant negative effects on human health and the environment'.

Considering those recognized health concerns related to mercury, the Convention contains an entire elaborate provision in the substance of the text on health aspects. Article 16 indeed encourages parties to promote the development and implementation of strategies to identify and protect populations at risk, including adopting 'science-based health guidelines relating to the exposure to mercury'; promote healthcare services for prevention, treatment and care of those exposed to mercury; and establish institutional and health professional capacities for the prevention, diagnosis, treatment and monitoring of health risks related to mercury exposure. It also calls for consultation with the WHO, the International Labour Organization and other organizations as appropriate.

While early environmental agreements linked the objectives related to human health in the preamble and scattered throughout the body of the text, it is significant that by 2013 there is a full free standing provision on health aspects. The express reference to the WHO further strengthens the platform and basis of public health concerns in international environmental law. This is further reinforced in Article 17 of the Convention on Information Exchange, which requires each party to facilitate the exchange of information concerning health impacts associated with exposure to mercury.[167] There is no separate free standing provision related to environmental impacts in that provision.

The Minamata Convention requires parties to develop strategies for identifying and assessing sites contaminated by mercury, and requires that action to reduce risks posed by mercury be performed to incorporate

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[166] Preamble of the Minamata Convention on Mercury 2013.

[167] Article 17(d) of the Minamata Convention on Mercury 2013.

an assessment of risks to human health and the environment.[168] Human health features before the environment in this provision in relation to the risks posed by mercury that must be considered. Human health accordingly plays a fundamental role in this Convention amongst others, and its role in international environmental agreements more generally may increase in the future.

Further, the Convention requires states that are subject to Article 7 on artisanal and small-scale gold mining[169] to develop a national action plan which should include a 'public health strategy on the exposure of artisanal and small-scale gold miners and their communities to mercury. Such a strategy should include, inter alia, the gathering of health data, training for health-care workers and awareness-raising through health facilities'.[170]

This goes even further than most other international environmental agreements. While most other agreements indeed recognize the link between human health and the environment and act to prevent harm to human health, this Convention expressly calls for the development of a public health strategy to deal with mercury exposure (in relation to gold miners). This indicates that where there are specific areas of interaction between human activity and the environment that put human beings in danger, international environmental law may be relied upon to require public health strategies to address these dangers. This Convention is accordingly an excellent example of how international environmental agreements may pursue and facilitate public health objectives.

These provisions expressly enunciating human health as an objective and concern in international environmental agreements cement the role of public health in environmental law and confirm the shared objectives: a healthy environment to breed healthy humans. These provisions demonstrate that human health and well-being drive action to protect the environment.

6. CONCLUDING REMARKS

As demonstrated above, international environmental law may be understood as the law of sustainable development, with human health and

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[168] Ibid., Article 12(2).

[169] Those that have artisanal and small-scale gold mining and processing within its territory.

[170] Ibid., Article 7(3)(c) and para. 1(h) of Annex C.

well-being at its core, linking the various strands of sustainable development together. This chapter has illustrated that the protection of human health and well-being is a clear objective of international environmental law encapsulated in the principles that emerged as soft law and were then elaborated upon in numerous international environmental agreements and crystallized as customary international law.

Health and the environment are inextricably linked in fact as outlined in Section 2. They are also inextricably linked in law given that concern for human health and well-being has been inherent to the development of international environmental law and now plays an express role in most texts and conventions. There is therefore ample basis for global health law to develop within the framework that evolved for what is known as international environmental law. Global health and the environment should be addressed in the same legal framework so they are not addressed in isolation, given the vital role that the environment plays for health and the grave risk to health if environmental risks are not addressed.

International environmental law has accordingly responded by placing human beings at the center of concerns for the environment, and by ensuring that the environment is at the center of activities and decisions related to economic development. Section 3 has outlined how the principles have emerged to reflect the role of human health driving the development of international environmental law.

Section 4 has highlighted and elaborated on the principles of international environmental law that are generally binding on all states as customary international law. These emerged as soft law principles in the movements described therein, with the Rio Declaration the crystallization of firm principles to protect the environment and human health. These principles and the tools of international environmental law may be used to further public health goals.

One particularly potent tool to expand space for action to protect public health is the obligation to conduct a transboundary environmental impact assessment that is binding as part of customary international law. This obligation gives effect to the principles of international environmental law and could serve to highlight any issues related to public health that may arise from planned activities. The findings of any impact assessment could further serve to buttress action to prevent environmental degradation that may impact human health and well-being.

Section 5 then sets out the international environmental agreements that have utilized these principles to pursue health objectives outright, or ensure that health objectives may be considered. One example that may serve as particularly useful for public health objectives is found in the

Minamata Convention on Mercury, which calls for the development of a public health strategy at the national level to deal with mercury exposure in relation to gold miners. Where there are areas of interaction between human activity and the environment that pose threats to human health, environmental law may be relied on to require public health strategies to address these risks.

There are numerous international environmental agreements that give effect to the link between health and the environment, and demonstrate that concern for human health is a driving force behind action to protect the environment. Initially, the preambles of international environmental agreements most expressly spelled out the link between health and the environment, and most if not all include prevention of harm to human health as a substantive obligation within the body of the text. Recent trends in agreements see health objectives featuring more prominently in free standing provisions as substantive obligations. At the most fundamental level, the principles and the agreements that contain them demonstrate the utility of environmental law to public health objectives.

The above analysis has demonstrated that human health and well-being is a strong motivating factor behind action to protect the environment. International environmental law may accordingly serve as a useful tool to pursue public health objectives.