SUSTAINABLE DEVELOPMENT AND PUBLIC INTERNATIONAL INSTITUTIONS:

LESSONS FROM THE MINING INDUSTRY

by

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Abstract: This thesis analyzes public and private international efforts towards sustainable development to date in the mining industry. Specifically, this thesis analyzes the roles of the United Nations, WTO, IMF and World Bank, and other institutions promoting sustainable development in the mining industry. This thesis also considers private company and NGO efforts towards sustainable development in the mining industry. The thesis concludes by recommending a public-private partnership for shared value in the mining industry with respect to sustainable development, meaning a partnership between industry, NGOs and public international institutions that generates economic value while simultaneously producing value to society by addressing societal and environmental problems.

Dedication

This work is dedicated to my little girls, Amelia & Beatrice.

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Chapter One

Thesis Introduction

Introduction

Over the last two decades, sustainable development has become a dominant goal of public international institutions that address trade and development issues. However, these same public international institutions have largely ignored the entire mining industry, despite its trillion dollar role in the global economy. Mining products have, for decades, composed 10% of the entire world merchandise trade. [1] Mining products also make up half of all world exports of primary products.[2] By comparison, all agricultural products also make up 10% of world merchandise trade. While agricultural products are a major focus of sustainable development efforts by public international institutions and in public international law, the economically equivalent mining industry remains ignored. Mining and mined products are rarely mentioned by public international institutions in the context of sustainable development or at all.

Confoundingly, many mined products also play an integral role in the "green economy," including copper and rare earth metals ("rare earths") used in a multitude of "green" products such as hybrid cars, wind energy turbines and solar panels. While the "green economy" is often discussed as a savior for sustainable development efforts, the mined metals foundational to that same green economy go ignored.

[1] World Trade Organization, International Trade Statistics 2000, Table IV.1, "World trade in mining products, 1999," < http://www.wto.org/english/res_e/statis_e/tradebysector_e.htm> accessed 31 January 2015

[2] World Trade Organization, International Trade Statistics 2000, Table IV.16, "World trade in mining products, 1999," < http://www.wto.org/english/res_e/statis_e/tradebysector_e.htm> accessed 31 January 2015

Some major publicly traded mining companies have voluntarily adopted limited sustainable development considerations in their internal governance, consistent with a growing corporate social responsibility movement. These moves were driven by societal, shareholder and NGO pressure. However, a significant proportion of global mining activity is either not conducted by publicly traded mining companies susceptible to societal and shareholder pressure, or is not conducted in countries where societal or governmental enforcement of sustainable development laws or goals occurs. Additionally, in all mining companies, voluntary compliance with sustainable development goals remain subservient to the prevailing legal requirement to maximize shareholder value. For these reasons, reliance on voluntary corporate action is insufficient.

Instead, public international institutions have an important role to play, indeed a mandate, to ensure the mining industry incorporates and adheres to sustainable development principles. The question thus arises: are public international institutions fulfilling their mandate towards sustainable development in the mining industry?

Research Question

The following work investigates the role public international law and institutions currently play in the mining industry with respect to sustainable development efforts, whether this current role is effective, and what improvements could or should be considered to better support sustainable development at the international institutional level.

Research Methodology

To answer this research question, an analysis of the sustainable development efforts of the major public international institutions, private international NGOs, and within the mining industry is undertaken. In particular, the sustainable development efforts of various United Nations agencies, the WTO, the World Bank and International Monetary Fund and some relevant smaller public international institutions are analyzed with respect to their role in and impact on the mining industry. Due to their significance, the roles of industry and international NGO efforts towards sustainable development in the mining industry also are analyzed. All of this work is undertaken in order to further determine the current and potential roles of public international institutional efforts, and define a future path, towards sustainable development in the mining industry.

Due to the breadth of the mining industry, this thesis uses the copper and rare earths mining segments as case studies to support the broader discussion. Copper and rare earths are used as examples based on their contrasting positions. Copper has ancient roots and a well-established global market. Rare earths are little known and compose a tiny and quite new portion of the global mined products industry, with a limited supply and demand market. Both copper and rare earths play an important role in technology and the "green economy" because they are integral components to many technology products which are themselves important to the sustainable development movement. Copper is mined in many areas throughout the world, whereas rare earths are mined predominantly in China and to a lesser extent in the United States. These two countries, representing the world's two largest economies, have very different relationships towards international sustainable development efforts. Rare earths also were recently the subject of a trade dispute within the World Trade Organization ("WTO"), providing a direct

means of determining part of the WTO's role in sustainable development efforts for rare earths and in the overall mining industry.

Research Necessity

This research is necessary to analyze international efforts towards sustainable development in the mining industry, a topic not currently discussed in industry or academia. This research also is necessary to identify international institutional limitations on sustainable development efforts within the mining industry.

Currently there are no known books or major academic articles discussing either the state of public international institutions' work towards sustainable development in the rare earths or copper industries specifically, or the mining industry generally. Additionally, there are no known analyses of the efficacy of sustainable development efforts by industry sector. There are excellent books and textbooks relating to the WTO, United Nations institutions, international environmental law, public international law and sustainable development generally.[3] There are also numerous publications generally discussing the mining industry and its environmental and social records.[4] There are several academic and other articles and books discussing corporate social responsibility including aspects of sustainable development in the mining industry,[5] but not discussing

[3] Michael J. Trebilcock, *Understanding Trade Law* (Edward Elgar Publishing Ltd. 2011); Peter Van den Bossche and Werner Zdouc*, The Law and Policy of the World Trade Organization* (Cambridge University Press 3rd Ed. 2013); Simon Chesterman, Thomas M. Franck, David M. Malone, *Law and Practice of the United Nations* (Oxford University Press 2008); Patricia Birnie, Alan Boyle, Catherine Redgwell, *International Law and the Environment* (Oxford University Press 2009); Ian Brownlie, *Principles of International Law* (7th Ed. Oxford University Press 2009); John Blewitt, *Understanding Sustainable Development* (2nd Ed. Routledge 2014).

[4] Ian A. Bowles and Glenn T. Prickett (eds.), *Footprints in the Jungle: Natural Resource Industries, Infrastructure and Biodiversity Conservation* (Oxford University Press 2001); Stuart Kirsch, *Mining Capitalism: The Relationship Between Corporations and Their Critics* (University of California Press 2014); Ravi Jain, *Environmental Impact of Mining and Mineral Processing* (Butterworth Heinemann 2015).

[5] Natalia Yakovleva, *Corporate Social Responsibility in the Mining Industries* (Ashgate Corporate Social Responsibility Series 2005); Alyson Warhurst (ed.), *Mining and the Environment: Case Studies from the*

the role of public international institutions in this context. Additionally, technical books and articles exist relating to mining industry techniques and practices, including best practices for environmental and worker protection.[6] However, no work was found that combines these topics.

Thus, this thesis provides much-needed attention towards improvements in public international institutions' work towards mining industry sustainable development efforts. This thesis also provides a new method for analyzing efficacy of sustainable development efforts by industry, rather than the prevailing method of analysis by project or company or country. This is important because industries and industry sectors have specific needs and challenges that must be addressed with respect to sustainable development issues because industry ultimately is tasked with implementing sustainable development efforts. Additionally, this thesis provides an outline for sustainable development efforts at the international level that can be applied to other industries.

Summary of Research Outcomes

Various United Nations agencies and affiliated organizations spend considerable efforts discussing sustainable development, including the landmark adoption of the 2015 Sustainable Development Goals. But the numerous UN agencies and associated bureaucracy hinder United Nations efforts and leave large gaps in implementing sustainable development efforts, including with respect to the mining industry. United Nations efforts are further hampered by the long-standing international legal principle of

Americas (International Development Research Centre 1999); Gavin Hilson and Barbara Murck, "Sustainable development in the mining industry: clarifying the corporate perspective," Resources Policy 26:4 (December 2000) 227-238 <http://www.sciencedirect.com/science/article/pii/S0301420700000416> accessed 27 January 2016.

[6] Alyson Warhurst and Ligia Noronha, *Environmental Policy in Mining: Corporate Strategy and Planning for Closure* (Lewis Publishers 2000).

state sovereignty over domestic natural resources, allowing states to use their domestic natural resources as states see fit. United Nations actors also may operate on a somewhat undeserved stigma against mining, ignoring the sustainable development possibilities in the mining sector. Furthermore, the lack of effective enforcement mechanisms beyond reporting requirements and peer pressure are significant limitations on the United Nations as a whole, and the recent global turn towards nationalism may make any structural reforms or increased enforcement mechanisms within the United Nations less likely.

The WTO has been criticized from its beginning for allegedly harming environmental and sustainable development efforts, as exemplified by the highly-publicized 1999 Seattle WTO meeting riots, dubbed the "Battle in Seattle."[7] However, the Marrakesh Agreement establishing the WTO specifically provides for sustainable development goals. At the same time, the Marrakesh Agreement and incorporated GATT terms define and limit the organization's opportunities to promote sustainable development. The fundamental purpose of the organization is as a trade organization, by agreement, and cannot be easily changed. Indeed, U.S. President Trump has cast doubt on the United States' continuing participation in the WTO. But the WTO has a key feature found nowhere else among public international institutions, a strong enforcement mechanism through its dispute resolution system. The WTO's dispute resolution decisions regarding environmental issues, particularly those relating to the Article XX(b)

[7] The newly-created WTO enjoyed only a brief "honeymoon" period as a new international organization because just four years later, at the WTO's Third Ministerial Conference in Seattle, Washington, in the United States, public protests and internal Member disagreements marred the conference. During the Seattle conference, roughly 50,000 protesters representing labor, social justice, environmental and anarchy groups took to the streets in Seattle against the WTO, initially peacefully but with some individuals turning to civil disobedience, violence and property destruction.

and (g) exceptions, have left substantial room for legitimate domestic environmental and sustainable development efforts. Additionally, the WTO has taken important administrative and other efforts to promote sustainable development.

The World Bank and IMF have increasingly incorporated sustainable development considerations in their operations and loan agreements. Both entities actively engage national governments and private industry to promote sustainable development. While improved enforcement and oversight is needed, these two institutions have done more towards sustainable development than perhaps all other public international institutions. Although the fundamental purpose of the institutions is not directly related to sustainable development, and despite recent global finance and security issues overshadowing sustainable development goals, the World Bank and IMF activities and programs towards sustainable developing in the mining industry and other industries are to be both commended and expanded.

Overall, the most promising efforts towards sustainable development in and through the mining industry arise from a *public-private partnership for shared value*. "Shared value" is the company generation of economic value that simultaneously produces value to society by addressing societal and environmental problems.[8] This public-private partnership for shared value would involve cooperative work of the IMF and World Bank in conjunction with national governments and the mining industry itself, combined with engagement of domestic and international private NGOs, fostered and

[8] Michael E. Porter and Mark R. Kramer, "Creating Shared Value," Harvard Business Review (January-February 2011) <https://hbr.org/2011/01/the-big-idea-creating-shared-value> accessed 25 September 2016. The authors promote shared value as a concept to reshape capitalism and its relationship to society.

promoted by the UN, all towards sustainable development efforts. The persons most directly affected by mining industry activities are the local communities, including unions and their workers, environmental groups, indigenous populations, and local communities. These populations are more likely to engage in efforts to ensure mining activities are carried out in a sustainable manner. But national political and economic pressures, especially in developing countries, often preclude participation. For these reasons, national governments as well as domestic and international NGOs must be engaged to consult with and ultimately benefit these populations. Additionally, while sustainable development pressure on the mining industry has begun to affect mining company balance sheets, the fragmented mining industry lacks sufficient cohesion and influence over domestic political and economic agendas to effectively address and incorporate sustainable development considerations into mining operations. For these reasons, the World Bank, IMF and other public international institutions to a lesser extent, all play an important role in providing assistance, technical support and enforcement mechanisms for domestic sustainable development efforts. The United Nations also should use its mandate to promote sustainable development to help bring about this public-private partnership for shared value.

Defining "Sustainable Development"

Before considering this topic, one must first establish an accepted definition or scope of the phrase "sustainable development."[9] As this is a relatively new phrase, coming into popular use in the past two decades or so, there remains much confusion

[9] There are dozens or hundreds of formulations of sustainable development. Nico Schrijver and Friedl Weiss, eds., *International Law and Sustainable Development* (Martinus Nijhoff 2004); T.C. Trzyna, ed., *A Sustainable World: Defining and Measuring Sustainable Development* (Calif. Inst. Of Public Affairs 1995).

over its meaning and scope. For example, some people consider sustainable development an outgrowth of the 1992 Earth Summit and the environmental movement, ignoring the "development" part of the phrase. Others simply consider sustainable development to reference green buildings or urban design.

It has generally been agreed from the outset that sustainable development incorporates at least aspects of both environmental protection and economic development. "It is sometimes suggested that [international law on sustainable development] has subsumed international environmental law." [10] However, sustainable development encompasses both environmental protection and development, whereas international environmental law does not specifically address economic or social development.

While the concept of environmental protection has existed for centuries,[11] the emergence of environmental protection in international law first officially arose in the 1890s in the *Pacific Fur Seal* arbitration, in which the United States unsuccessfully proposed a right to protect fur seals from wanton destruction by mankind, even outside the three-mile territorial waters of the United States.[12] The dispute arose after the United States purchased Alaskan territory from Russia and asserted rights to the Bering Sea waters surrounding Alaska, which Canadian sealing ships used for hunting and killing principally nursing female fur seals. The arbitration panel rejected the United States'

[10] Patricia Birnie, Alan Boyle, Catherine Redgwell, *International Law and the Environment* (Oxford University Press 2009) 4.
[11] *Case Concerning the Gabčíkovo-Nagymaros Project* (Hungary/Slovakia) ICJ Reports (1997) 7 (Separate Opinion of Vice-Pres. Weeramantry), tracing sustainable development to ancient tribes of Sri Lanka, Eastern Africa, America and Europe and in Islamic tradition.
[12] John Bassett Moore, *History and Digest of the International Arbitrations to which the United States has been a Party* vol. 1 (United States Government Printing Office 1898) 935, reprinted by United Nations <legal.un.org/riaa/cases/vol_XXVIII/263-276.pdf> accessed 11 April 2015.

assertion of rights to fur seals beyond the traditional three-mile boundary, but the same panel adopted regulations to protect the fur seals beyond national jurisdiction that are still considered "best practices" today, including adopting a no-hunt area, creation of a hunting season, hunting vessel licensing, recording and reporting of fur seals taken, significant restrictions on hunting methods, and an exception for fur seal hunting by native tribes in the area.[13]

The international legal concept of protecting natural resources from destruction and for future use has developed and strengthened over the succeeding decades.[14] The landmark 1972 United Nations Conference on the Human Environment, held in Stockholm, was the culmination of years of growing environmental activism into the first United Nations conference regarding the human environment.[15] The 1972 Stockholm Conference's resulting declaration proclaimed, unequivocally, that "[t]he protection and improvement of the human environment is a major issue which affects the well-being of peoples and economic development throughout the world; it is the urgent desire of the

[13] John Bassett Moore, *History and Digest of the International Arbitrations to which the United States has been a Party* vol. 1 (United States Government Printing Office 1898) 935, reprinted by United Nations <legal.un.org/riaa/cases/vol_XXVIII/263-276.pdf> accessed 11 April 2015. The articles adopted by the tribunal contain many of the same "best practices" used for fisheries and species management to the present day.

[14] The United Nations itself points to industrialization, British romantic poets, Henry David Thoreau, World War II, nuclear weapons, Rachel Carson's book "Silent Spring" and outer-space photos of Earth as contributing towards the growing environmental movement <http://www.un.org/en/globalissues/environment/> accessed 25 October 2014.

[15] New Zealand Court of Appeal Judge Glazebrook notes the Stockholm Conference was organized following a series of environmental disasters, including the grounding of the *Torrey Canyon* oil tanker off the English and French coasts in 1967. Hon. Susan Glazebrook, "Human Rights and the Environment," 40 Victoria University of Wellington Law Review (2009) 293. Environmental damage from the *Torrey Canyon* disaster continues today. Patrick Barkham, "Oil spills: Legacy of the *Torrey Canyon*," The Guardian (24 June 2010) <http://www.theguardian.com/environment/2010/jun/24/torrey-canyon-oil-spill-deepwater-bp> accessed 1 November 2014.

peoples of the whole world and the duty of all Governments."[16] The Stockholm Declaration succinctly states that the environmental challenge in developing countries is from under-development, while the challenge for developed countries is industrialization and technological development. [17] The Declaration recognizes the existence of a human right to life in an environment of sufficient quality to permit a life of dignity and well-being, along with a concomitant responsibility "to protect and improve the environment for present and future generations." [18] With respect to non-renewable resources such as minerals, the Stockholm Declaration states such resources "must be employed in such a way as to guard against the danger of their future exhaustion and to ensure that benefits from such employment are shared by all mankind." [19] The Declaration encourages accelerated development in developing countries through technological and financial assistance, *but also* encourages stable prices and earnings for the raw materials of developing countries, acknowledging that developing countries must and will use their domestic raw materials towards development.[20] Indeed, the Stockholm Declaration recognizes a country's sovereign right, based on the United Nations Charter and international legal principles, "to exploit their own resources pursuant to their own environmental policies," along with the responsibility to ensure such activities do not

[16] Report of the United Nations Conference on the Human Environment (16 June 1972), A/CONF.48/14/REV.1, Para. 2. The conference's Report also recommended GATT cooperation on issues relating to trade and the environment, at p. 26, Recommendation 103, including through technical assistance to countries to meet environmental objectives and pre-imposition discussion of any trade barriers intended to protect the environment.
[17] Report of the United Nations Conference on the Human Environment (16 June 1972), A/CONF.48/14/REV.1, 3-5, Para. 4.
[18] Report of the United Nations Conference on the Human Environment (16 June 1972), A/CONF.48/14/REV.1, 3-5, Principle 1.
[19] Report of the United Nations Conference on the Human Environment (16 June 1972), A/CONF.48/14/REV.1, 3-5, Principle 5.
[20] Report of the United Nations Conference on the Human Environment (16 June 1972), A/CONF.48/14/REV.1, pp. 3-5, Principles 9, 10.

damage the environment beyond the country's jurisdiction.[21] The agreed-upon principles highlight the tensions between development and environmental protection, resource allocation, sovereignty and the global commons. Although the phrase "sustainable development" was not yet coined, it is clear the concept was integral to the 1972 Stockholm Conference, a concept furthered in the following decade.

Fifteen years after the Stockholm Declaration, the 1987 Brundtland Report is commonly viewed as the point from which sustainable development became a major global policy objective.[22] In 1983, the United Nations General Assembly created a special commission, the World Commission on Environment and Development, to prepare a report on the environment and sustainable development, looking ahead to the year 2000 and beyond.[23] Norwegian Prime Minister Gro Harlem Brundtland chaired the Commission.[24] The resulting report, titled "Our Common Future" but most often called the Brundtland Report, was adopted by the United Nations Environment Programme and accepted by the United Nations General Assembly in 1987.[25] The Brundtland Report plainly stated: "the 'environment' is where we all live; and "development" is what we all do in attempting to improve our lot within that abode… [t]he two are inseparable."[26]

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[21] Report of the United Nations Conference on the Human Environment (16 June 1972), A/CONF.48/14/REV.1, pp. 3-5, Principle 21.

[22] Philippe Sands and Jacqueline Peel, *Principles of International Environmental Law* (Cambridge University Press 2012) 9; United Nations Report of the World Commission on the Environment and Development ("Brundtland Report"), A/43/427 (4 August 1987). Sands and Peel also refer to the 1980 World Conservation Strategy use of the phrase sustainable development (p. 38). The Brundtland Report is sometimes referred to as "Our Common Future," referring to the title of the report.

[23] Brundtland Report, A/43/427 (4 August 1987), Note of the Secretary-General, p. 1.

[24] Brundtland was Norway's first female prime minister in 1981, and again served as Norway's prime minister between 1986-1989 and 1990-1996. A doctor, she subsequently headed the World Health Organization. United Nations, "Biography of Dr Gro Harlem Brundtland" <http://www.un.org/News/dh/hlpanel/brundtland-bio.htm> accessed 11 April 2015.

[25] Brundtland Report, A/43/427 (4 August 1987), Note of the Secretary-General, p. 1; United Nations General Assembly Resolution 42/187 (1987).

[26] Brundtland Report, A/43/427 (4 August 1987), Foreword, p. 13.

The Report goes on to define sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."[27] More specifically, the Brundtland Report stated:

> Humanity has the ability to *make development sustainable to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs*. The concept of sustainable development does imply limits - not absolute limits but limitations imposed by the present state of technology and social organization on environmental resources and by the ability of the biosphere to absorb the effects of human activities… sustainable development is not a fixed state of harmony, but rather a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are made consistent with future as well as present needs. We do not pretend that the process is easy or straightforward.

This general definition, omitting some of the Report's examples, was widely accepted as the international definition for sustainable development. Since the Brundtland Report, sustainable development has been at the forefront of significant international attention, including both the environmental and development aspects of the generally accepted meaning of sustainable development.

In accordance with Brundtland Report recommendations, another major conference was planned, the United Nations Conference on Environment and Development, to take place in Rio de Janeiro, Brazil, in 1992. Called the "Earth Summit," the almost universally-attended multi-national conference "stressed that for environmental concerns to affect and influence behaviour in significant ways they must be integrated into economic and development activities."[28] The Earth Summit's

[27] Brundtland Report, A/43/427 (4 August 1987), pp. 24-25.
[28] Philippe Sands and Jacqueline Peel, *Principles of International Environmental Law* (Cambridge University Press 2012) 41.

crowning achievement was adoption of "Agenda 21," an excruciatingly detailed program for international action towards sustainable development.[29] While Agenda 21 recognizes the primary responsibility of national governments for implementation, it envisions a strong role for international institutions in coordinating and aiding national efforts.[30] In general, Agenda 21 seeks to promote sustainable development through increased and improved international trade, poverty reduction and improved human health, improved resource management and conservation, and empowering peoples and groups including women, youth, indigenous peoples and corporations.[31] One specific Agenda 21 item seeks to promote sustainable development through international trade, including increased openness of the multilateral trading system, improved market access for developing countries, and improved commodity markets.[32] Despite the breadth of Agenda 21, there is no meaningful mention or discussion of mining, raw materials or metals and minerals. Additionally, the excessive detail contained in Agenda 21 has made it unwieldy to convert to a plan for implementation.

After Stockholm and Rio, sustainable development has pervaded international conversations regarding development and the environment. Numerous conferences, committees and groups have subsequently addressed sustainable development in a

[29] Report of the United Nations Conference on Environment and Development (14 June 1992), A/CONF.151/26/Rev.1 (also "Rio Declaration" or "Agenda 21"). The Conference also adopted certain principles, similar to and building on those in the Stockholm Declaration twenty years earlier. The Rio Declaration also recognized a right to development (with notable dissenters including the United States), and concomitant obligation to incorporate environmental protection in the development process (Principles 3, 4).

[30] United Nations Conference on Environment and Development, "Agenda 21" (14 June 1992), A/CONF.151/26 (Vol. I), Para. 1.3.

[31] United Nations Conference on Environment and Development, "Agenda 21" (14 June 1992), A/CONF.151/26 (Vols. I-III).

[32] United Nations Conference on Environment and Development, "Agenda 21" (14 June 1992), A/CONF.151/26 (Vol. I), Paras. 2.9-2.16.

meaningful manner, including the Second United Nations Conference on Human Settlements (Istanbul, 1996), the Special Session of the General Assembly on Small Island Developing States (New York, 1999), the Millennium Summit (New York, 2000), the WTO's Doha Ministerial Conference (Doha, 2001), and the World Summit on Sustainable Development (Johannesburg, 2002). Following the 2000 Millennium Summit in New York, eight goals with 21 targets and 48 indicators were adopted in areas ranging from poverty reduction to child education, women's equality disease eradication.[33] Among resulting Millennium Development Goals, Goal 7 is to ensure environmental sustainability, with the associated targets of (a) integrating "the principles of sustainable development into country policies and programs and revers[ing] the loss of environmental resources, (b) halving by 2015 the proportion of people without sustainable access to safe drinking water and basic sanitation, and (c) achiev[ing] by 2020 a significant improvement in the lives of at least 100 million slum dwellers.[34]

For purposes of defining sustainable development, perhaps the most important recent event occurred at the World Summit on Sustainable Development in 2002. The Summit resulted in adoption of the Johannesburg Declaration on Sustainable Development, reaffirming international commitment to sustainable development, including the three pillars of sustainable development: economic development, social

[33] United Nations Millennium Project <http://www.unmillenniumproject.org/goals/> accessed 25 October 2014.

[34] United Nations Millennium Declaration (8 September 2000), A/Res/55/2; United Nations Millennium Project <http://www.unmillenniumproject.org/goals/> accessed 25 October 2014. The Millennium Declaration did not itself create the list the eight millennium development goals (MDGs) and associated targets and indicators. Eight MDGs and associated targets and indicators were developed shortly after the Millennium Conference.

development and environmental protection.[35] Included in the Declaration was the statement:

> [p]rudence must be shown in the management of all living species and natural resources, in accordance with the precepts of sustainable development. Only in this way can the immeasurable riches provided to us by nature be preserved and passed on to our descendants. The current unsustainable patterns of production and consumption must be changed in the interest of our future welfare and that of our descendants.[36]

This important revision to the recognized definition or scope of sustainable development incorporated, in concrete terms, the concept of social development as part of the previously accepted pillars of economic development and environmental protection. Social development issues had been raised within the discussion of sustainable development since at least Rio, but the Johannesburg Declaration squarely established the now-recognized three elements to sustainable development.[37]

Most recently, following expiration of the moderately successful Millennium Development Goals, the United Nations planned for and hosted the Sustainable Development Summit in September 2015. The summit's agenda proposed 17 sustainable development goals that ambitiously went well beyond the modestly successful Millennium Development Goals.[38] Key focus for the sustainable development goals (SDGs) include poverty eradication and climate change management, a nod to two

[35] Report of the World Summit on Sustainable Development (4 September 2002), A/CONF.199/20, Johannesburg Declaration, Para. 5.
[36] United Nations Millennium Declaration, Preamble (8 September 2000), A/Res/55/2.
[37] The Johannesburg Declaration also included not-so-subtle changes to the rhetoric of sustainable development. Report of the World Summit on Sustainable Development ("Johannesburg Declaration") (4 September 2002), A/CONF.199/20, Para. 19.
[38] United Nations, "Consensus Reached on New Sustainable Development Agenda to be adopted by World Leaders in September" (2 August 2015) < http://www.un.org/sustainabledevelopment/blog/2015/08/transforming-our-world-document-adoption/> accessed 16 January 2016.

of three sustainable development pillars.[39] Remarkably, all 193 nations attending the Summit unanimously adopted the sustainable development goals, work on which began January 1, 2016 and is scheduled to end in 15 years.[40] The new sustainable development goals were given a kick start with the United Nations Climate Change Conference in Paris in December 2015, at which 195 countries adopted a universal climate agreement.[41] The three pillars of sustainable development have now been firmly established through the SDGs.

As shown in the above discussion, the growth in recognition of sustainable development as a goal and expected outcome of development efforts has occurred rapidly but no less firmly. There is now no question that three pillars of sustainable development exist: (a) economic development plus (b) social development plus (c) environmental protection. This also is the definition of sustainable development applied in this thesis.

State Sovereignty Over Domestic Natural Resources

In tension with sustainable development goals, and consistent with the truism that responsibilities and rights co-exist but also conflict,[42] sustainable development has not

[39] United Nations, "Consensus Reached on New Sustainable Development Agenda to be adopted by World Leaders in September" (2 August 2015), < http://www.un.org/sustainabledevelopment/blog/2015/08/transforming-our-world-document-adoption/> accessed 16 January 2016.

[40] United Nations, "Launch of new sustainable development agenda to guide development actions for the next 15 years" (31 December 2015) <http://www.un.org/sustainabledevelopment/blog/2015/12/launch-of-new-sustainable-development-agenda-to-guide-development-actions-for-the-next-15-years/> accessed 16 January 2016.

[41] United Nations, "Historic Paris Agreement on Climate Change: 195 nations set path to keep temperature rise well below 2 degrees celsius" (12 December 2015) < http://newsroom.unfccc.int/unfccc-newsroom/finale-cop21/> accessed 16 January 2016.

[42] Martin Dixon, Robert McCorquodale and Sarah Williams, *Cases and Materials on International Law* (5th Ed. Oxford University Press 2011) 394. The authors cite Judge Huber in the *Spanish Zone of Morocco Claims* Case (2 RIAA 615, 1925) as stating "responsibility is the necessary corollary of a right [and] [a]ll rights of an international character involve international responsibility."

overtaken a foundational international principle that states are free to use their domestic natural resources as they see fit.[43] This principle has existed since ancient times, when rulers and empires fought for expanded territory in large part based on the need and availability of natural resources. Since the Treaty of Westphalia in 1648, ending the Thirty Years War and recognizing borders of European nation-states, a key aspect of nation-state recognition has been national sovereignty over domestic territory, including the natural resources within that domestic territory. Of note, Europe developed rapidly following the end of the Thirty Years War and resulting establishment of generally recognized borders and sovereignty with trade rather than conquest becoming, in fits and starts, a primary method of acquisition of necessary natural resources for domestic development.[44] For centuries now, nation-state development and power has derived to a significant extent from the natural resources available for exploitation within the nation-state and claimed colonies.[45] This remained true throughout pre-industrial times. With industrialization beginning in the 1800s, the importance of natural resources expanded and the need for fuel and raw materials for industrial production grew exponentially. Industrialization and expansion also brought new challenges, including extra-territorial environmental impacts from industrial activities.

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[43] Robert McCorquodale, "International Law, Boundaries and Imagination," in D. Miller and S. Hashmi (eds.) *Boundaries and Justice* (Princeton University Press 2001). McCorquodale notes that state territorial boundaries both establish statehood and are the basis for state sovereignty ownership and control over peoples and natural resources.

[44] Arguably, the liberalized trade of the Hanseatic League in the North and Renaissance Italy in the South were precursors to any post-Westphalia trade, peace and development. This is all, of course, a Euro-centric view and does not take into account the contributions of Islam and the Middle East as well as Hinduism/Buddhism and Asia towards the primacy of trade and development over conquest and war. This discussion is beyond the scope of this thesis.

[45] The role of colonialism and exploitation of natural resources of colonies throughout the globe also plays a significant role in development and industrialization, but is beyond the scope of this thesis, as is the detrimental effects of colonialism on local populations and environments. The "resource curse" theory is discussed in the next chapter.

The principle of state sovereignty over domestic natural resources has been formally recognized at the international level for centuries, and is espoused in several United Nations General Assembly resolutions dating to the beginning of the United Nations. In 1952, the United Nations General Assembly adopted Resolution 626, affirming the "Right to Exploit Freely [State] Natural Wealth and Resources," directly referring to permanent sovereignty over state natural resources. [46] Ten years later, the General Assembly similarly adopted Resolution 1803, again affirming the "Right to Exploit Freely [State] Natural Wealth and Resources."[47] This principle is recognized even in the key documents supporting the international sustainable development movement, including the 1992 Rio Declaration on Environment and Development. The Rio Declaration specifically stated, in Principle 2:

> 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 and developmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.[48]

But state sovereignty over use of domestic natural resources is not an unlimited right. The principle was at the heart of the *Pacific Fur Seal* arbitration, discussed above. The arbitration resulted in internationally recognized fur seal hunting limitations for purposes of fur seal protection for future generations,[49] becoming one of the first official decisions

[46] United Nations General Assembly Resolution 626 (VII), "Right to Exploit Freely Natural Wealth and Resources" (21 December 1952).
[47] United Nations General Assembly Resolution 1803 (XVII), "Right to Exploit Freely Natural Wealth and Resources" (14 December 1962).
[48] Report of the United Nations Conference on Environment and Development, Principle 2 (14 June 1992) A/CONF.151/26/Rev.1 ("Rio Declaration").
[49] John Bassett Moore, History and Digest of the International Arbitrations to which the United States has been a Party, vol. 1 (United States Government Printing Office 1898) 935, reprinted by United Nations <legal.un.org/riaa/cases/vol_XXVIII/263-276.pdf> accessed 11 April 2015.

recognizing limits to state sovereignty over domestic resources. The arbitration also helped establish the "No Harm" principle in international environmental law.[50]

No case exemplifies the tensions between industrial-era domestic use of natural resources and extra-territorial effect disputes better than the *Trail Smelter* arbitration. In the early 1900s, air pollution from a lead and zinc smelter located in Trail, British Columbia, Canada, became the subject of a long-fought international dispute over trans-boundary air pollution flowing into the State of Washington in the United States, damaging farm and other lands.[51] Early attempts at resolution failing, Great Britain (still ruling Canada) and the United States agreed to submit the dispute to international arbitration, and the arbitrators determined that Great Britain was required to pay $78,000 USD to the United States for damage as well as take steps and place restrictions on smelting operations to minimize damage to the surrounding area in the future.[52] The arbitration panel decided, in 1941, that:

> under the principles of international law, as well as of the law of the United States, no State has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another or the properties or persons therein, when the case is of serious

[50] Philippe Sands and Jacqueline Peel, *Principles of International Environmental Law* (Cambridge University Press 2012) 26.

[51] Reports of International Arbitration Awards, *Trail Smelter* case, 1938 and 1941 (United Nations 2006) <http://legal.un.org/riaa/cases/vol_III/1905-1982.pdf> accessed 16 January 2016. The smelter at issue began as a copper smelting operation in the late 1800s, went idle, and was restarted for lead and zinc smelting during World War I. Sulfur is a byproduct of the smelting process. In the 1920s, a 400-foot tall smokestack was added to the smelter to reduce air pollution in the immediate area, but allegedly exacerbated the sulfur problems a few miles away in Washington State. Canadian and some American land owners in the area immediately around the smelter filed individual lawsuits in the early 1900s for damages, and the smelter owner paid damages, purchased easements or purchased whole lands around the smelter. $78,000 USD is approximately $5,950,000 USD today.

[52] Reports of International Arbitration Awards, *Trail Smelter* case, 1938 and 1941 (United Nations 2006) <http://legal.un.org/riaa/cases/vol_III/1905-1982.pdf> accessed 16 January 2016. The limitations on future smelting operations and requirement to minimize damage to the surrounding area was akin to injunctive relief. World War II may have factored into the small amount of damages, and contributed to the war allies' desire to finally resolve the dispute.

> consequence and the injury is established by clear and convincing evidence.[53]

This statement is routinely cited as the cornerstone to the "No Harm" or "preventative" principle, that states cannot use their natural resources in such a manner as to significantly injure nearby states and their peoples and lands.[54]

The other major early case for sustainable development is the *Lac Lanoux* arbitration in 1957, an arbitrated dispute between France and Spain over the use of lake waters for hydroelectric power generation. In this case, the arbitration panel rejected Spain's complaint because France assured that the water flows would remain the same, the water would just be diverted for hydroelectric power generation first then returned to the waterway.[55] Far from recognizing a limitation on state sovereignty over domestic natural resources, the tribunal reinforced the principle that France had sovereignty over the waters in its territories.

Thus, arbitration decisions have recognized the "no harm" principle but the principle has not been greatly expanded since 1938. One final point must be made regarding these arbitrations, the decisions only came about because the states voluntarily agreed to submit the dispute to arbitration. States wishing to preserve inviolate state

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[53] Reports of International Arbitration Awards, *Trail Smelter* case, 1941 decision, p. 1965 (United Nations 2006), <http://legal.un.org/riaa/cases/vol_III/1905-1982.pdf> accessed 16 January 2016.

[54] Martin Dixon, Robert McCorquodale and Sarah Williams, Cases and Materials on International Law (5th Ed. Oxford University Press 2011) 455, recognizing the "preventative principle" from the *Trail Smelter* case is now part of customary international law, requiring that states have "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 national jurisdiction."

[55] Spain v. France (*Lac Lanoux* case), 24 Int'l Law Rep. 101 (1957). France and Spain had an 1866 agreement under which each state maintained sovereignty over the waters in its territory, and once the waters flowed into the other state's territory that state maintained sovereignty. Other arbitrations and cases address sovereignty issues, many over international waters, but the primary issues are boundary disputes and reinforce the state sovereignty principle over waters flowing within the state's borders.

sovereignty over domestic natural resources need only reject arbitration of a dispute, unless financial or other incentives (or threats of reprisals) are sufficient to override the state's opposition to arbitration. In this manner, even the question whether to arbitrate an international environmental dispute is essentially a sovereignty issue.

The next substantive limitations on state sovereignty over domestic natural resources came in the 1970s and thereafter, with international treaties and agreements relating to many environmental and sustainable development issues. For examples, the Convention on International Trade in Endangered Species (CITES) came into force in 1975 with now 181 states,[56] the Convention on the Conservation of Migratory Species of Wild Animals (CMS) completed in 1979, and the United Nations Convention on Law of the Sea (UNCLOS) finalized in 1982 and incorporating state sovereignty over domestic natural resources but *subject to* the duty to protect marine resources and the marine environment.[57] However, these are all agreements by state parties, and thus do not stand for further limitation on state sovereignty over domestic natural resources recognized in international law as opposed to by agreement. Rather, these treaties and agreements reinforce the principle that states can willingly enter into international agreements that limit state sovereignty in some manner, but this is done when the gains to the states outweigh any costs and losses, including lost sovereignty.[58] Incentives and pressures from domestic environmental interest groups, international financial and political

[56] CITES website <https://www.cites.org/eng/disc/what.php> accessed 21 January 2016.
[57] United Nations Convention on the Law of the Sea, Article 193 (1982) <http://www.un.org/depts/los/convention_agreements/texts/unclos/closindx.htm> accessed 21 January 2016.
[58] Thomas J. Miles and Eric A. Posner, "Which States Enter Into Treaties, And Why?" John M. Olin Law & Economics Working Paper No. 420 (University of Chicago Law School August 2008) <http://www.law.uchicago.edu/lawecon/index.html> accessed 12 November 2016.

incentives, and increasing domestic political power through leadership in international environmental and sustainable development issues, among other factors, all work together to produce international agreements and treaties impacting sustainable development. In this manner, the international environmental and sustainable development agreements and treaties reinforce rather than limit the principle of state sovereignty.

Public international institutions also have not expanded limitations on state sovereignty over domestic natural resources. To the contrary, as discussed in greater detail later, the WTO recently reaffirmed state sovereignty over domestic natural resources, including in the March 2014 Panel Report in the *Rare Earths* case.[59] There, the Panel stated:

> [t]he principle of sovereignty over natural resources thus recognizes that WTO Members have the right to use their natural resources to promote their own development while also encouraging the regulation of such use to ensure sustainable development.[60]

In other words, the WTO recognizes the unimpeded right of states to use and dispose of their natural resources as they see fit, but encourages WTO Members to do so in accordance with the principles of sustainable development.

Relationship Between Sustainable Development and State Sovereignty

Although limitations have been recognized, the principle of state sovereignty over domestic natural resources remains stronger than concepts of sustainable development. In tracing the history of the two principles, it is quite clear that state

[59] Panel Report, WT/DS431/R (26 March 2014), p. 96, paras. 7.265-7.268. The Panel Report also found that this sovereignty does not extend to violation of international trade agreements or control of international markets.
[60] Panel Report, WT/DS431/R (26 March 2014), p. 96, para. 7.265.

sovereignty over domestic natural resources has existed for at least two or three centuries, and arguably for thousands of years. By contrast, limitations on this aspect of state sovereignty have only been pursued for a century or less. The *Pacific Fur Seal* arbitration in 1893 represented an unsuccessful attempt that reinforced the primacy of state sovereignty over domestic natural resources. The *Trail Smelter* arbitration in 1938 and 1941 did recognize a limitation on state sovereignty, allowing damages and requiring future limitations on smelting activities, but only in cases of "serious consequence" as established by "clear and convincing evidence," the highest civil standard of proof.

Ultimately, the principle of state sovereignty over domestic natural resources, is not necessarily inconsistent with sustainable development. Rather, both principles can live in harmony. However, this depends in large part on the state's own interest in regional and international relations as well as the state's domestic dedication to sustainable development principles and practices. States will not relinquish sovereignty over domestic natural resources unless the state believes it is or may be in the state's interest to do so. The recent Paris climate change negotiations[61] highlight this fact, large developed states such as the United States voluntarily agreed to carbon emissions "goals" which are not enforceable, large developing states did likewise with less ambitious carbon emissions goals, and small developing states did not agree to goals unless sufficient financial incentives were provided. The result of these negotiations confirms that state sovereignty over domestic natural resources remains a very strong principle, and will not give way unless high incentives and low costs are available. More positively stated, international negotiations relating to sustainable development and

[61] United Nations Framework Convention on Climate Change ("Paris Agreement") (12 December 2015) <https://unfccc.int> accessed 12 November 2016.

limiting state sovereignty over domestic natural resources are possible provided the right mix of incentives can be found. In this regard, a public-private partnership for shared value provides an opportunity for finding the right mix of incentives.

Impact of Terrorism and Economic Challenges

A brief mention of terrorism, prevailing global challenges, and the 2008 economic downturn also is appropriate, with respect to their impacts on the sustainable development agenda. Public international attention prior to the September 11, 2001 terrorist attacks in the United States focused on poverty and hunger reduction, universal primary education, gender equality, reduced child mortality and improved maternal health, combating disease and environmental sustainability, as included in the Millennium Development Goals. Subsequent to the September 11 terrorist attacks, the Johannesburg Declaration describes the threats for sustainable development as follows: "chronic hunger; malnutrition; foreign occupation; armed conflict; illicit drug problems; organized crime; corruption; natural disasters; illicit arms trafficking; trafficking in persons; terrorism; intolerance and incitement to racial, ethnic, religious and other hatreds; xenophobia; and endemic, communicable and chronic diseases."[62] Of these fourteen priorities, nine or ten relate to war or crime and their causes. Several of the areas contained in the Millennium Development Goals are omitted from this Johannesburg Declaration list, including universal primary education, gender equality, child mortality and improved maternal health, although these issues are discussed

[62] Report of the World Summit on Sustainable Development (4 September 2002), A/CONF.199/20, Johannesburg Declaration, Para. 5.

elsewhere in the Declaration. This shift in focus following the 2001 terrorist attacks has had lasting impacts for global sustainable development.

Additionally, the Arab Spring, Libya's collapse, the war in Syria, and the Northern Africa/European refugee crisis have all had significant negative impacts on the ability of the global community to pursue a sustainable development agenda. Perhaps the biggest consequence of these events is the extreme right-turn various European countries and the United States have taken, embracing racism and nationalism among other negative human traits in response to the various crises. Likewise, the 2008 global economic crisis and resulting negative or slow economic growth has detracted from progress towards the Millennium Development Goals through, at a minimum, loss of funding and economic development for meeting the goals. In this regard, sustainable development as a global 2030 agenda may be off to a rocky start, and a turn towards state sovereignty if not ultra-nationalism may be underway, potentially eroding the global focus on sustainable development.

In order to endeavor to answer the research question, a basic understanding and analysis of the mining industry itself must exist, as exemplified by the rare earths and copper products and markets discussed next.

Chapter Two

Mining Industry and Markets: Rare Earths and Copper Examples

Introduction

This chapter first generally describes the mining industry overall. Next, this chapter describes the unique processes and markets for copper and rare earths, as these mined metals will be referenced throughout this thesis and the mining processes and markets present unique issues for sustainable development efforts. The chapter concludes by discussing the important role the mining industry can play in promoting sustainable development, setting up the remainder of the thesis for discussion of promoting sustainable development in mining.

Mining Industry Generally

To aid in understanding the importance of sustainable development in mining, it is helpful to understand more about the mining industry itself. The mining industry commands more than a $1 trillion dollar (USD) role in the global economy. Mining products comprise over 5% of the world merchandise exports -- by comparison clothing and textiles combined make up less than 4.5% and *all* agricultural products make up less than 10% of world merchandise exports.[63] Mining products also historically make up half of all world exports of primary products.[64] Gold, silver, platinum and precious gems are the most recognizable and coveted mined products, while mined coal accounts for 29% of global energy supply and met 40% of the world's electricity needs in 2013.[65]

[63] World Trade Organization, International Trade Statistics 2015, Table II.1, "World merchandise exports by major product group, 2014" < http://www.wto.org/english/res_e/statis_e/tradebysector_e.htm> accessed 14 November 2016.
[64] World Trade Organization, International Trade Statistics 2000, Table IV.16, "World trade in mining products, 1999" < http://www.wto.org/english/res_e/statis_e/tradebysector_e.htm> accessed 31 January 2015. 1999 is used as available data in a strong economy.
[65] International Energy Agency, "FAQs: Coal" < http://www.iea.org/aboutus/faqs/coal/> accessed 28 February 2015; Albert Stwertka, *A Guide to the Elements* (2nd Ed. Oxford University Press 2002) 34-36.

Other commonly known mined products include aluminum and iron, the latter also is a key component in steel.[66] The IMF's rather gloomy global economic forecast in January 2016 highlights several aspects of the mining industry as impacting the global economy, including reduced investment by China and low mining prices.[67]

The major cost factors for mining products include the percentage of valuable content and grade of the ore (rock) being mined (lower grade requires more processing costs), transportation costs (typically truck then rail), and proximity to purchasing markets (typically shipping).[68] Less common mined products include copper and rare earths that are crucial to the technology industry, as discussed below. Based on their integral relationship with future sustainable development initiatives, the technology revolution and the green economy, the copper and rare earths mining sectors are discussed in detail and used as case studies throughout this thesis. A discussion of rare earths and copper mining and markets follows.

1. Rare Earths Mining

Unlike ancient copper, rare earth metals were only identified and isolated in the past hundred years, and their uses only became known in the past few decades. Also unlike copper, which nearly everyone can identify by sight, few people outside the mining and technology industries or science teachers have heard of rare earth elements ("rare earths"). The rare earths are a group of elemental metals with properties that make

[66] Albert Stwertka, *A Guide to the Elements* (2nd Ed. Oxford University Press 2002) 90.
[67] International Monetary Fund, "World Economic Outlook: Update January 2016" <http://www.imf.org/external/pubs/ft/weo/2016/update/01/index.htm> accessed 14 February 2016.
[68] BMI Research, "Tracking the Cost Leaders in Iron Ore Production" (1 February 2013) < bmiresearch.com> accessed 27 January 2016.

them crucial to the global technology industry.[69] All of the rare earths are metals, some lighter in weight and some heavier. As metals, they conduct electricity and heat, some have magnetic properties, and some have optical properties such as glowing certain colors.[70] Generally, light-weight rare earths are more abundant than heavy rare earths, although rare earth abundance in a particular deposit can vary widely.[71] Earth abundance is not an industrially useful measure, however. Approximately two thirds of the Earth is covered by water, making access to otherwise abundant solid elements difficult, and earth abundance is an average but solid elements are not spread uniformly around the Earth. The rare earths are deposited in pockets, some under water and some on land in Inner Mongolia (China), Australia (Mt. Weld) and the United States (Mountain Pass, California). Commercial viability for these deposits is also a concern, as mining and processing is expensive, so rare earths quantities must be significant enough to justify the cost. Additionally, not all rare earths have known economic values, so mining and separation of some rare earth elements is not presently done.[72]

Low weight, magnetism, electrical conductivity, malleability and other properties of rare earths make them nearly indispensable to the modern world. Rare earths are used

[69] The phrase "rare earth elements" commonly refers to the lanthanide series in the periodic table of elements plus one or two elements with similar properties: scandium (periodic table symbol SC, atomic number 21), and yttrium (Y, 39). The lanthanide series in the periodic table of elements includes, from light to heavy, lanthanum (La, 57), cerium (Ce, 58), praseodymium (Pr, 59), neodymium (Nd, 60), promethium (Pm, 61), samarium (Sm, 62), europium (Eu, 63), gadolinium (Gd, 64), terbium (Tb, 65), dysprosium (Dy, 66), holmium (Ho, 67), erbium (Er, 68), thulium (Tm, 69), ytterbium (Yb, 70), and lutetium (Lu, 71). Most of these elements were not fully discovered and their pure forms isolated until the 20th century.

[70] Some rare earth metals were originally used in pottery and glass coloring and television tubes.

[71] United States Geological Survey, "The Principal Rare Earth Elements Deposits of the United States—A Summary of Domestic Deposits and a Global Perspective," Scientific Report 2010-5220 (2010) 10-11 <http://pubs.usgs.gov/sir/2010/5220/pdf/SIR2010-5220.pdf> accessed 3 November 2013.

[72] United States Geological Survey, "The Principal Rare Earth Elements Deposits of the United States—A Summary of Domestic Deposits and a Global Perspective," Scientific Report 2010-5220 (2010) 10-11 <http://pubs.usgs.gov/sir/2010/5220/pdf/SIR2010-5220.pdf> accessed 3 November 2013.

in a wide range of technology products including solar panels, wind turbines, electric and hybrid car motors, automotive catalytic converters, laser and hard disk drives, cell phones and "ear buds," appliances, LEDs and compact fluorescent lights, and military defense applications.[73] A United States Navy submarine can require nearly 10,000 pounds of rare earths and related compound materials.[74] Without rare earths, many of the world's modern technologies would not be viable or affordable. Rare earths properties also are being studied for new applications, including hydrophobicity, or water repulsion, in ceramic and other applications.[75] Overall global demand for rare earths products is expected to rise between 5.6% and 8.6% per year over the next 25 years.[76] Rare earths are non-renewable, not easily recyclable, few if any good substitutions are known to exist, and any mining necessarily reduces the availability for future generations.

[73] United States Geological Survey, Mineral Commodities Summary (January 2012) <http://minerals.usgs.gov/minerals/pubs/commodity/rare_earths/mcs-2012-raree.pdf> accessed 3 November 2013; Charles Rousseaux, United States Department of Energy, "Critical Materials and Rare Futures: Ames Laboratory Signs a New Agreement on Rare-Earth Research" (15 June 2011) <http://energy.gov/articles/critical-materials-and-rare-futures-ames-laboratory-signs-new-agreement-rare-earth-research> accessed 3 November 2013; Molycorp, Inc. ("Molycorp") 2012 Annual Report, introduction p. 5, report 4, 7 <http://www.molycorp.com/wp-content/uploads/Molycorp-Year-End-Reivew-2012.pdf> accessed 3 November 2013; Congressional Research Service, "Rare Earth Elements: The Global Supply Chain," Summary (16 December 2013) <www.fas.org/sgp/crs/natsec/R41347.pdf> accessed 12 January 2014.

[74] Valerie Bailey Grasso, "Rare Earth Elements in National Defense: Background, Oversight Issues, and Options for Congress" R41744 Congressional Research Service (23 December 2013) 20. Rare earth materials refers not to the raw mined metals but the compounds created from them.

[75] Gisele Azimi et al., "Hydrophobicity of rare-earth oxide ceramics," 12 Nature Materials (20 January 2013) 315–320 <http://www.nature.com/nmat/journal/v12/n4/full/nmat3545.html> accessed 9 March 2014.

[76] Joshua Allsop and Kenneth P. Green, Mining News, "Rare Earths Elements – China's weakening hold" (27 August 2014) <www.miningfacts.org> accessed 15 February 2015. Global consumption of rare earths products, including rare earth oxides (REOs) was 136,000 tons in 2010, with 26% used in magnets and 16% used in fluid catalytic cracking catalysts used in petroleum products refining. The growth rate estimates may change slightly with China and EU economies slowing, but assuming the economies follow a cyclical pattern the 25-year outlook remains reliable.

So-called "rare" earth elements are not actually all that rare. By earth abundance standards, a measure widely accepted by the scientific community to measure rarity of elements, rare earths are more common than gold.[77] The phrase rare earth likely comes from the fact that, due to their atomic composition, the elements "hide" with other elements, prohibiting their identification until the 20th century, making their isolation more difficult, and making existence of rare earths in pure form rare. [78] Due to their similar elemental properties, the rare earths often are found together. The rare earths are all distinct elements, and each element requires a different process for extraction.[79] This actually makes rare earths mining more expensive because, even though they are co-located, many different separation processes are needed to separate the different rare earths.[80] But rare earths have other properties that make them challenging. Some metals, such as gold and copper, are found with high levels of purity, making mining a laborious but not technologically difficult process. Rare earths are different. "The rare earth production process is complex and expensive. The stages of production consist of mining, separating, refining,[81] alloying, and manufacturing rare earths into end-use items

[77] United States Geological Survey, Mineral Commodities Summary (January 2012) <http://minerals.usgs.gov/minerals/pubs/commodity/rare_earths/mcs-2012-raree.pdf> accessed 3 November 2013; United States Geological Survey, "The Principal Rare Earth Elements Deposits of the United States—A Summary of Domestic Deposits and a Global Perspective," Scientific Report 2010-5220 (2010) 3 <http://pubs.usgs.gov/sir/2010/5220/pdf/SIR2010-5220.pdf> accessed 3 November 2013.
[78] United States Geological Survey, "The Principal Rare Earth Elements Deposits of the United States—A Summary of Domestic Deposits and a Global Perspective," Scientific Report 2010-5220 (2010) 3 <http://pubs.usgs.gov/sir/2010/5220/pdf/SIR2010-5220.pdf> accessed 3 November 2013.
[79] United States Geological Survey, "The Principal Rare Earth Elements Deposits of the United States—A Summary of Domestic Deposits and a Global Perspective," Scientific Report 2010-5220 (2010) 7 <http://pubs.usgs.gov/sir/2010/5220/pdf/SIR2010-5220.pdf> accessed 3 November 2013.
[80] United States Geological Survey, "The Principal Rare Earth Elements Deposits of the United States—A Summary of Domestic Deposits and a Global Perspective," Scientific Report 2010-5220 (2010) 7 <http://pubs.usgs.gov/sir/2010/5220/pdf/SIR2010-5220.pdf> accessed 3 November 2013.
[81] A.J. Eardley, *Science of the Earth* (Harper & Rowe, Publishers, Inc. 1972) 25-27. The rare earth elements do not exist in single units, rather the elements combine together to form crystals. Crystals are made up of fundamental elements that combine in a regular repeating three-dimensional pattern, think of salt as a crystal. Crystals can grow indefinitely by adding more particles on the outside, think of a giant

and components."[82] The Mountain Pass, California rare earths mine, for instance, uses multiple stages of crushing,[83] milling, flotation, cracking and chemical separation in order to produce rare earths with sufficient purity and in sufficient quantities to be commercially useful.[84] The cost of the energy and water required for rare earths mining is a major input cost for mining rare earths.[85] The environmental and human costs of this local energy and water usage, including opportunity costs, is typically not calculated into the true mining cost.

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hunk of salt as made up of millions of tiny salt crystals, the internal crystalline structure of which is mainly constant or uniform throughout. Crystals "grow" by additions of layers of particles, often combining due to travel in a common carrier such as water. Consider a salt lake, when the water evaporates in sun or heat the salt within the water forms crystals, sometimes very large crystals, and this process of evaporating water lets the crystals grow even larger. The internal arrangement of the crystal is the same regardless the outward-appearing size. This crystal process is exploited in the discovery, mining and chemical separation of the rare earths into pure form or into useable oxides and compounds.

[82] Valerie Bailey Grasso, "Rare Earth Elements in National Defense: Background, Oversight Issues, and Options for Congress" R41744 Congressional Research Service (23 December 2013) 14; United States Government Accountability Office, Rare Earth Materials in the Defense Supply Chain, GAO-10-617R (14 April 2010) 19 <http://www.gao.gov/new.items/d10617r.pdf> accessed 12 January 2014.

[83] A.J. Eardley, *Science of the Earth* (Harper & Rowe, Publishers, Inc. 1972) 102-139; Cornelis Klein and Cornelius S. Hurlbut, Jr., eds., *Manual of Mineralogy* (21st Ed. John Wiley & Sons, Inc. 1977) 170-190, 221-235; United States Geological Survey, "The Principal Rare Earth Elements Deposits of the United States—A Summary of Domestic Deposits and a Global Perspective," Scientific Report 2010-5220 (2010) 3 <http://pubs.usgs.gov/sir/2010/5220/pdf/SIR2010-5220.pdf> accessed 3 November 2013; Albert Stwertka, *A Guide to the Elements* (2nd Ed. Oxford University Press 2002) 146-149; Congressional Research Service, "Rare Earth Elements: The Global Supply Chain," (16 Dec. 2013) 9, 16 <www.fas.org/sgp/crs/natsec/R41347.pdf> accessed 12 January 2014. Earth is made up of core (center), mantle (middle) and a very thin crust or outer shell. Think of an egg, with the yolk in the center as a core, the egg white as the mantle around the yolk, and the very thin egg shell as the outer crust. The earth's crust under the continents is about 36 km thick (under the sea floor about 10-13km thick), constituted by a thin top layer of sedimentary rock and unconsolidated material below which is a thick layer of igneous (volcanic) and metamorphic rock. Some solid elements are dispersed throughout the crust material while other elements including rare earths are concentrated in certain areas, due mainly to the processes by which the elements came to the earth's crust in the first place. Rare earths are most commonly found in monazite or carbonatite forms of igneous rock. Carbonatites such as bastnäsite are one type of igneous rock that has gone through the magmatic process and has resulted in a strong concentration of carbonatite in the resulting rock. Monazites are weathered rocks, including sands that have created tails of elements in the surrounding soils, leaving "placer deposits" of elements, sometimes including rare earths and radioactive elements such as thorium.

[84] Molycorp 2012 Annual Report 8 <http://www.molycorp.com/wp-content/uploads/Molycorp-Year-End-Reivew-2012.pdf> accessed 3 November 2013.

[85] Molycorp 2012 Annual Report, 9, 10 <http://www.molycorp.com/wp-content/uploads/Molycorp-Year-End-Reivew-2012.pdf> accessed 3 November 2013.

Mining and significant processing of earth crust materials, rocks, are necessary to produce commercially useable amounts of rare earth metals and related rare earth compound materials. Ore deposits[86] containing rare earths first must be located.[87] Once identified, the ore must be analyzed to determine whether the concentration of the metals to be mined multiplied by the market value of the metals creates sufficient value versus mining costs to make mining in that location economically feasible.[88] Additionally, for private and public companies, the market must be strong enough and risk-accepting enough to produce initial capital to fund exploration and start-up, which can be quite expensive.[89] Keeping in mind, commodity market fluctuations occur, such that by the time exploration identifies a source, ownership and permits are obtained and mine operations can begin, the economic feasibility of the mine could reverse, or reverse several times.[90]

Adding to the complexity is the fact that thorium and uranium, both radioactive elements, are commonly co-located with rare earths, and thorium is the most common

[86] For example, the rare earth deposit at Molycorp's Mountain Pass mine in California is located within a raised block of Precambrian metamorphic and igneous rocks, including Early Proterozoic metamorphic rocks and Middle Proterozoic ultrapotassic rocks and carbonatites, mostly bastnäsite. The identified rare earths deposit (strike length) is about 2,750 feet (850 meters) long, and the thickness of the portion of the rare earths zone ranges between 15 to 250 feet (5 to 75 meters). The concentrations of rare earths within the Mountain Pass bastnäsite include cerium (49%), lanthanum (34%), neodymium (11.7%), praseodymium (4%), and lesser amounts of gadolinium, samarium, yttrium and europium. The concentration of rare earths within the ore determines whether it is economically feasible to mine and process the ore for the rare earths market. The "cut-off grade" or level of economic feasibility used at Mountain Pass is just 5%. Molycorp 2012 Annual Report 38 <http://www.molycorp.com/wp-content/uploads/Molycorp-Year-End-Reivew-2012.pdf> accessed 3 November 2013.
[87] David A. Rothery, *Geology- The Key Ideas* (McGraw-Hill Companies, Inc., 1997) 193-202.
[88] David A. Rothery, *Geology- The Key Ideas* (McGraw-Hill Companies, Inc., 1997) 193-202. Costs of transport to market as well as regulatory compliance costs also factor in.
[89] David A. Rothery, *Geology- The Key Ideas* (McGraw-Hill Companies, Inc., 1997) 193-202.
[90] David A. Rothery, *Geology- The Key Ideas* (McGraw-Hill Companies, Inc., 1997) 193-202.

impurity for rare earths.[91] Radioactive waste presents significant worker safety, human health and environmental concerns, and adequate mine safety protocols and domestic regulation and enforcement are necessary to protect against the potential harms. The former chief technology officer and executive vice president for rare earths mining company Molycorp, John Burba, also a former Dow chemist, developed many of the new processes used to segregate the various rare earths, noting "[a]ll these elements have close to the same atomic mass and the same ionic charge," therefore "[i]t takes a lot of chemistry," and "[y]ou use a huge amount of acid and base."[92] Burba reports China also uses chemical processes for rare earths segregation, but "[t]hey use a very corrosive sulfuric acid system that actually liberates hydrofluoric acid, which is … so aggressive it solubilizes everything, including thorium (a radioactive element)," then the wastewater leaks into groundwater, creating an acidic, metal-filled, radioactive water dangerous to human health and the environment.[93] Burba's comments highlight the important of strong regulation and oversight of the rare earths mining industry.

All of these potential environmental impacts generally increase financial as well as potential human health and environment costs, especially in countries with enforced

[91] United States Geological Survey, "The Principal Rare Earth Elements Deposits of the United States—A Summary of Domestic Deposits and a Global Perspective," Scientific Report 2010-5220 (2010) 7 <http://pubs.usgs.gov/sir/2010/5220/pdf/SIR2010-5220.pdf> accessed 3 November 2013; Cornelis Klein and Cornelius S. Hurlbut, Jr., eds., *Manual of Mineralogy* (21st Ed. John Wiley & Sons, Inc. 1977) 221-235; Molycorp 2012 Annual Report 15-16 <http://www.molycorp.com/wp-content/uploads/Molycorp-Year-End-Reivew-2012.pdf> accessed 3 November 2013. The atomic character (ionic charge) of the lanthanides is similar in outer electron configuration to the actinide radioactive metals, such that the rare earths tend to be found together with uranium and other radioactive metals. For practical purposes, this means mining of rare earths and separation of the rare earths from their surrounding material leaves radioactive elements behind. In other words, mining rare earths creates radioactive waste.

[92] Kalee Thompson, "One American Mine Versus China's Rare Earths Dominance," Popular Mechanics (14 January 2013).

[93] Kalee Thompson, "One American Mine Versus China's Rare Earths Dominance," Popular Mechanics (14 January 2013).

environmental and human health laws.[94] For instance, Molycorp's Mountain Pass facility must comply with United States, State of California and San Bernardino County environmental protection laws and rules.[95] Molycorp's Estonia-based facility Silmet must comply with European Union and Estonian environmental protection laws and rules.[96] More regulatory requirements mean more financial costs, and in 2012 Molycorp spent nearly $30 million for environmental expenditures, including salaries and permits and compliance costs, just at its Mountain Pass facility.[97] China's environmental regulatory structure differs from American and European systems in that it appears to be a mainly reactive rather than proactive or preventive system, to the extent environmental regulation is enforced at all. For example, China imposes graduated national fees and local fees for waste discharge, plus fines for excessive discharge and possible closure for failing to comply with environmental damage remediation requirements.[98]

Finally, as with all mining, worker safety is a significant consideration.[99] National and local worker safety requirements impact mining and processing operations

[94] Molycorp 2012 Annual Report 6, 8-9, 10-15 <http://www.molycorp.com/wp-content/uploads/Molycorp-Year-End-Reivew-2012.pdf> accessed 3 November 2013.
[95] Molycorp 2012 Annual Report 11-14 <http://www.molycorp.com/wp-content/uploads/Molycorp-Year-End-Reivew-2012.pdf> accessed 3 November 2013.
[96] Molycorp 2012 Annual Report 11-14 <http://www.molycorp.com/wp-content/uploads/Molycorp-Year-End-Reivew-2012.pdf> accessed 3 November 2013. Molycorp also has some joint ventures in China and, with respect to environmental compliance at the China joint ventures, Molycorp reports: "there is no assurance that Chinese national or local authorities will not impose additional regulations which would require additional expenditures that may have a material adverse effect on the profitability" of the joint ventures. Somewhat similarly, Molycorp reports for its Mountain Pass facility that the environmental "permit processes and enforcement thereof, change frequently, and any such future changes could materially adversely affect our mining operations." This discussion of the Chinese and American regulatory situation hints at the uncertainty in both systems.
[97] Molycorp 2012 Annual Report 12 <http://www.molycorp.com/wp-content/uploads/Molycorp-Year-End-Reivew-2012.pdf> accessed 3 November 2013.
[98] Molycorp 2012 Annual Report 14-15 <http://www.molycorp.com/wp-content/uploads/Molycorp-Year-End-Reivew-2012.pdf> accessed 3 November 2013.
[99] Molycorp 2012 Annual Report 9, 10 <http://www.molycorp.com/wp-content/uploads/Molycorp-Year-End-Reivew-2012.pdf> accessed 3 November 2013.

and costs. Unions also impact operations and costs in those facilities where workers are represented by unions. Of course, fewer requirements generally mean fewer costs while more requirements mean more costs. By extrapolation and experience, this means that some mining enterprises seek out countries with few environmental, worker safety and human health protections, or weak enforcement. This problem is often referred to as "pollution haven," that polluting industries migrate operations to countries with fewer environmental restrictions, although the existence and extent of this problem is debated.[100] An OECD analysis suggests:

> any tendency toward formation of a pollution havens seems to have been self-limiting, because economic growth brings countervailing pressure to bear on polluters through increased regulation, technical expertise, and 'clean sector' production. In practice, pollution havens have apparently been as transient as low-wage havens.[101]

While the economics of the pollution haven theory remains to be proven, there is certainly evidence in the mining industry that mining companies operate at lower cost in countries with fewer environmental and human health protections or lax enforcement, and one can logically conclude that, absent disincentives, mining companies will prefer to operate in countries where costs are lower and profits can be maximized.[102]

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[100] Nancy Birdsall and David Wheeler, "Trade Policy and Industrial Pollution in Latin America: Where Are the Pollution Havens?" Journal of Environment and Development 2(1) (January 1993) 137-149. The origin of the pollution haven theory is unclear. Birdsall and Wheeler are among the first to discuss the pollution haven theory, arguing economic openness encourages adoption of developed country pollution standards while closed economies are more likely to become pollution havens.

[101] Muthukumara Mani and David Wheeler, "In Search of Pollution Havens? Dirty Industry in the World Economy, 1960-1995," room document presented at OECD Conference on FDI and the Environment (28-29 January 1999) <http://www.oecd.org/industry/inv/investmentstatisticsandanalysis/2076285.pdf> accessed 12 January 2014.

[102] Most articles simply assume the pollution haven theory is correct Beata Smarzynska Javorcik and Shang-Jin Wei, "Pollution Havens and Foreign Direct Investment: Dirty Secret or Popular Myth?," Contributions to Economic Analysis & Policy vol. 3(2) (Berkeley Electronic Press 2004) 1244 <http://www.nber.org/papers/w8465> accessed 1 October 2016.

Another factor to consider is that materials containing rare earths, such as rare earth oxides and compounds, are a derived demand product.[103] This means there is essentially no direct consumer demand for pure rare earth metals, rather the rare earth metals go into rare earth oxide products that then go into other products that do have end use industrial or commercial consumer demand, such as smartphones and hybrid cars and wind turbines.[104] This is called the global value chain or global supply chain, a topic gaining attention from public international institutions and NGOs because diffuse global supply chains increase the number of jurisdictions that must address environmental or sustainability standards. An increase in the demand for the end product increases demand for the raw rare earth metals.[105] This also means end users and consumers have little if any knowledge about the component parts of products including rare earths, including their source or the methods by which the component parts come to market. As discussed below, this renders public information campaigns like "fair trade" or "sustainably sourced" unlikely to succeed for rare earths.

2. Risks of China Dominance of Rare Earths Market

A safe, stable and sustainable rare earths industry and market is important to global technology markets, but the rare earths market has been anything but safe, stable and sustainable in the past 20 years.[106] Rare earth materials demand was originally met

[103] Congressional Research Service, "Rare Earth Elements: The Global Supply Chain," (16 Dec. 2013) 3 <www.fas.org/sgp/crs/natsec/R41347.pdf> accessed 12 January 2014.
[104] Congressional Research Service, "Rare Earth Elements: The Global Supply Chain," (16 Dec. 2013) 3 <www.fas.org/sgp/crs/natsec/R41347.pdf> accessed 12 January 2014.
[105] Congressional Research Service, "Rare Earth Elements: The Global Supply Chain," (16 Dec. 2013) 3 <www.fas.org/sgp/crs/natsec/R41347.pdf> accessed 12 January 2014.
[106] Joshua Allsop and Kenneth P. Green, "Rare Earths Elements – China's weakening hold," Mining News (27 August 2014) <www.miningfacts.org> accessed 15 February 2015; Keith Bradsher, "Amid Tension, China Blocks Vital Exports to Japan," New York Times (22 September 2010) <http://www.nytimes.com/2010/09/23/business/global/23rare.html?pagewanted=all&_r=1&> accessed 15 February 2015; Massachusetts Institute of Technology, "Mission 2016: The Future of Strategic Natural

entirely by mining in the United States, specifically the Mountain Pass mine in the desert in eastern California, near the Nevada border. The Mountain Pass mine was started, owned and operated by Molybdenum Corporation of America, which was purchased by Unocal in 1977. Unocal ran the mine through the 1990s, but Unocal's principal business was petroleum products not rare earths mining and processing.[107] During Unocal's ownership, the Mountain Pass mine encountered growing competition from China as well as increasing domestic environmental pressures.[108] Consequently, United States domination of the rare earths market declined.[109] By the 1990s, mining at Mountain Pass was dwindling for a variety of reasons, including soft rare earths prices, high production costs relative to China, permit delays, mine waste disposal limitations and environmental issues arising from the facility's leaking wastewater piping.[110] Unocal closed down Mountain Pass rare earths separation in 1998, when the wastewater pipe leakage issue arose,[111] sold off most of the mining equipment such as shovels and trucks, then sold the

Resources – Rare Earth Elements" <http://web.mit.edu/12.000/www/m2016/finalwebsite/elements/ree.html> accessed 9 March 2014. Drivers for demand of rare earths include price (although high price does not necessarily lead to substitution for rare earths because available substitutes generally are inferior in performance), overall global economic strength and related increases or decreases in industrial production, technology changes (although increased technology production is expected to generally increase rare earths demand), and government spending such as on military applications or nuclear power (demand-side impact).

[107] Congressional Research Service, "Rare Earth Elements: The Global Supply Chain," (16 Dec. 2013) 15 <www.fas.org/sgp/crs/natsec/R41347.pdf> accessed 12 January 2014.

[108] Valerie Bailey Grasso, "Rare Earth Elements in National Defense: Background, Oversight Issues, and Options for Congress" R41744 Congressional Research Service (23 December 2013) 16.

[109] Congressional Research Service, "Rare Earth Elements: The Global Supply Chain," (16 December 2013) 14 <www.fas.org/sgp/crs/natsec/R41347.pdf> accessed 12 January 2014.

[110] Molycorp 2012 Annual Report 39 <http://www.molycorp.com/wp-content/uploads/Molycorp-Year-End-Reivew-2012.pdf> accessed 3 November 2013; Congressional Research Service, "Rare Earth Elements: The Global Supply Chain," (16 December 2013) 14 <www.fas.org/sgp/crs/natsec/R41347.pdf> accessed 12 January 2014.

[111] Molycorp 2012 Annual Report 38 <http://www.molycorp.com/wp-content/uploads/Molycorp-Year-End-Reivew-2012.pdf> accessed 3 November 2013.

shuttered Mountain Pass mine property and facilities to Chevron in 2005.[112] Chevron, also a petroleum company, resumed limited operations in 2007, mainly separation of rare earths from existing rare earth feedstocks, which are the post-mined, pre-separated rare earths existing on site.[113] In 2008, the Mountain Pass mine property and facilities were purchased by Molycorp, a newer company dedicated to rare earths mining and related products, and Molycorp did not take on the financial liabilities from the wastewater pipe leak.[114] However, simultaneous slowed economic growth in China, the EU and elsewhere in the 2010s has reduced demand for Molycorp products to such an extent that the company declared bankruptcy in 2015.[115]

While the United States essentially eliminated its rare earths mining in the 1980s and 1990s, other rare earths mines around the world began or increased production, including Bayan Obo Mining District[116] in Inner Mongolia, China, several mines in southern China, and to much lesser extents Lovozero in Russia and small mining

[112] Molycorp 2012 Annual Report 38 <http://www.molycorp.com/wp-content/uploads/Molycorp-Year-End-Reivew-2012.pdf> accessed 3 November 2013; Valerie Bailey Grasso, "Rare Earth Elements in National Defense: Background, Oversight Issues, and Options for Congress" R41744 Congressional Research Service (23 December 2013) 16.

[113] Molycorp 2012 Annual Report 38 <http://www.molycorp.com/wp-content/uploads/Molycorp-Year-End-Reivew-2012.pdf> accessed 3 November 2013.

[114] Molycorp 2012 Annual Report 5, 38 <http://www.molycorp.com/wp-content/uploads/Molycorp-Year-End-Reivew-2012.pdf> accessed 3 November 2013. Although Molycorp did not take on the past owners' environmental liabilities, it was required to meet stringent local, state and federal environmental regulations going forward.

[115] John W. Miller and Anjie Zheng, "Molycorp Files for Bankruptcy Protection," Wall Street Journal (25 June 2015) <http://www.wsj.com/articles/SB10907564710791284872504581069270334872848> accessed 21 January 2016.

[116] For an overhead view of Bayan Obo from outer space <http://earthobservatory.nasa.gov/IOTD/view.php?id=77723> accessed 11 April 2015. The accompanying explanation note states that the Chinese Society of Rare Earths reports that, for every ton of rare earth metals mined, the associated waste includes 9,600 to 12,000 cubic meters of waste gas, a ton of radioactive waste, and 75 cubic meters of acidic wastewater.

operations in India, Brazil and Malaysia.[117] By the mid-2000s, the Bayan Obo mine district along with mines in Xunwu and Longnan, China, accounted for about 95% of the global rare earths market.[118] China's expansion of its rare earths mining operations did not come without significant environmental costs. Baotou city, just south of the Bayan Obo Mining District, and the nearby mine tailings pond called Lake Baotou recently was the subject of an in-depth BBC investigation, in which the lake was described as follows:

> Dozens of pipes line the shore, churning out a torrent of thick, black, chemical waste from the refineries that surround the lake. The smell of sulphur and the roar of the pipes invades my senses. It feels like hell on Earth… Even before getting to the toxic lake, the environmental impact the rare earth industry has had on the city is painfully clear. At times it's impossible to tell where the vast structure of the Baogang refineries complex ends and the city begins. Massive pipes erupt from the ground and run along roadways and sidewalks, arching into the air to cross roads like bridges… After it rains they plough, unstoppable, through roads flooded with water turned black by coal dust. They line up by the sides of the road, queuing to turn into one of Baotou's many coal-burning power stations that sit unsettlingly close to freshly built apartment towers. Everywhere you look, between the half-completed tower blocks and hastily thrown up multi-storey parking lots, is a forest of flame-tipped refinery towers and endless electricity pylons. The air is filled with a constant, ambient, smell of sulphur. It's the kind of industrial landscape that America and Europe has largely forgotten – at one time parts of Detroit or Sheffield must have looked and smelled like this… It's a truly alien environment, dystopian and horrifying. The thought that it is man-made depressed and terrified me, as did the realisation that this was the by-product not just of the consumer electronics in my pocket, but also green technologies like wind turbines and electric cars that we get so

[117] United States Geological Survey, "The Principal Rare Earth Elements Deposits of the United States—A Summary of Domestic Deposits and a Global Perspective," Scientific Report 2010-5220 (2010) 12, 15 <http://pubs.usgs.gov/sir/2010/5220/pdf/SIR2010-5220.pdf> accessed 3 November 2013.

[118] United States Geological Survey, "The Principal Rare Earth Elements Deposits of the United States—A Summary of Domestic Deposits and a Global Perspective," Scientific Report 2010-5220 (2010) 15 <http://pubs.usgs.gov/sir/2010/5220/pdf/SIR2010-5220.pdf> accessed 3 November 2013; Congressional Research Service, "Rare Earth Elements: The Global Supply Chain," (16 December 2013) 11, 16 <www.fas.org/sgp/crs/natsec/R41347.pdf> accessed 12 January 2014; Anton Chakhmouradian and Frances Wall, "Rare earth elements: minerals, mines, magnets, (and more)," Elements 8(5) (October 2012) 333-340; Gareth Hatch, "Dynamics in the global market for rare earth," Elements 8(5) (October 2012) 341-346.

> smugly excited about in the West. Unsure of quite how to react, I take photos and shoot video on my cerium polished iPhone.[119]

In fact, since rare earths are found in many places in mineable quantities around the globe, including America, it may be China's willingness to accept these environmental costs that allowed it to become the global leader in rare earths mining and processing in such a short time, as a pollution haven. The BBC reporter Tim Maughan pin-points this exact issue, writing:

> While China produces 90% of the global market's neodymium [used for magnets], only 30% of the world's deposits are located there. Arguably, what makes it, and cerium [used for touch-screens], scarce enough to be profitable are the hugely hazardous and toxic processes needed to extract them from ore and to refine them into usable products. For example, cerium is extracted by crushing mineral mixtures and dissolving them in sulphuric and nitric acid, and this has to be done on a huge industrial scale, resulting in a vast amount of poisonous waste as a by-product. It could be argued that China's dominance of the rare earths market is less about geology and far more about the country's willingness to take an environmental hit that other nations shy away from.[120]

Any time a single country or location constitutes a single concentrated source for a mined product, concerns of price manipulation as well as vulnerability to man-made or natural disruptions or disasters are significant.[121] Indeed, during the BBC's visit to Baotou city in 2015, BBC reporter Tim Maughan noted the following:

> As we are wandering through the factory's hangar-like rooms, it's impossible not to notice that something is missing. Amongst the mazes of pipes, tanks, and centrifuges, there are no people. In fact there's no activity at all. Apart from our voices, which echo through the huge sheds, the plant is silent. It's very obviously not operating. When asked, our

[119] Tim Maughan, "The dystopian lake filled by the world's tech lust," BBC (2 April 2015) <http://www.bbc.com/future/story/20150402-the-worst-place-on-earth> accessed 11 April 2015.
[120] Tim Maughan, "The dystopian lake filled by the world's tech lust," BBC (2 April 2015) <http://www.bbc.com/future/story/20150402-the-worst-place-on-earth> accessed 11 April 2015.
[121] United States Geological Survey, "The Principal Rare Earth Elements Deposits of the United States—A Summary of Domestic Deposits and a Global Perspective," Scientific Report 2010-5220 (2010) 15 <http://pubs.usgs.gov/sir/2010/5220/pdf/SIR2010-5220.pdf> accessed 3 November 2013.

> guide tells us the plant is closed for maintenance – but there's no sign of that either: no maintenance crews, no cleaning or repairs being done. When pushed further our guide gets suspicious, wonders why we are asking so many questions, and clams up. It's a behaviour we'll encounter a lot in Baotou – a refusal to answer questions or stray off a strictly worded script. As we leave, one of our party who has visited the area before suggests a possible explanation: could local industry be artificially controlling market scarcity of products like cerium oxide, in order to keep rare earth prices high? We can't know for sure that this was the case the day we visited. Yet it would not be unprecedented: in 2012, for example, the news agency Xinhua reported that China's largest rare earth producer was suspending operations to prevent price drops.[122]

Similarly, in August 2009, China's Interior Ministry and Ministry of Foreign Commerce began tightening export controls on China's mined rare earths. This move was perhaps based on the importance of rare earths availability to domestic industry and China's reported desire to conserve domestic rare earths resources.[123] China's official position was that restrictions on domestic production and export of rare earth materials was for environmental and human health protection.[124] Other explanations for China's actions have been reported, including cutting off rare earths supplies to Japan in retaliation after Japan held a Chinese fishing boat captain caught in the disputed Senkaku (Japan)/Diaoyus (China) islands area.[125] China also may have been motivated to induce global manufacturers to locate operations in China to support or induce domestic

[122] Tim Maughan, "The dystopian lake filled by the world's tech lust," BBC (2 April 2015) <http://www.bbc.com/future/story/20150402-the-worst-place-on-earth> accessed 11 April 2015.
[123] China reportedly stated the export controls on its domestic rare earths were due to environmental concerns, although this was argued to the WTO to be a pretext for price manipulation. Esther Tanquintic-Misa, "China's Rare Earths Export Restrictions Defy WTO Rules," International Business Times (31 October 2013).
[124] Lucy Hornby and Shawn Donnan, "WTO rules against China on rare earths export quotas," Financial Times (29 October 2013) <http://www.ft.com/cms/s/0/486d5c68-40b5-11e3-ae19-00144feabdc0.html#axzz2vW0qBTE1> accessed 9 March 2014.
[125] Keith Bradsher, "Amid Tension, China Blocks Vital Exports to Japan," New York Times (22 September 2010) <http://www.nytimes.com/2010/09/23/business/global/23rare.html?pagewanted=all&_r=1&> accessed 15 February 2015; Kalee Thompson, "One American Mine Versus China's Rare Earths Dominance," Popular Mechanics (14 January 2013).

manufacturing development.[126] Columbia University geochemist and mine consultant Peter Kelemen noted, "these de facto embargoes all serve to signal to people who make magnets, for example, that it might be better to manufacture magnets in China and export them than buy exported rare earths and make magnets elsewhere."[127] It is likely that China had many reasons for their actions, some officially acknowledged and some not, but all related to domestic economic and geo-political issues.

China's export controls included export duties and restrictions, export quotas, increased export tariffs and taxes (up to 25%), export pricing restrictions, and domestic rare earths production limits, including limiting new licenses for rare earths exploration.[128] China's governmental actions reduced China's exports of rare earths by more than half, from 61,000 metric tons in 2006 to 30,246 metric tons in 2011.[129] China's official production quotas went from 86,520 metric tons in 2006 to 93,800 metric tons in 2011, but the United States Geological Survey estimates actual production in China went from 119,000 metric tons in 2006 to 105,000 metric tons in 2011.[130] Dr.

[126] Lucy Hornby and Shawn Donnan, "WTO rules against China on rare earths export quotas," Financial Times (29 October 2013) <http://www.ft.com/cms/s/0/486d5c68-40b5-11e3-ae19-00144feabdc0.html#axzz2vW0qBTE1> accessed 9 March 2014.

[127] Kalee Thompson, "One American Mine Versus China's Rare Earths Dominance," Popular Mechanics (14 January 2013).

[128] World Trade Organization, "China – Measures Related to the Exportation of Rare Earths, Tungsten and Molybdenum," Request for Consultation by the United States, WT/DS431/1, G/L/982 (15 March 2012) <https://docs.wto.org> accessed 12 January 2014. There is some evidence that the Chinese government also wanted to carry out some domestic mining consolidation, closing some rare earths mines in the south and concentrating production in the easier-managed Inner Mongolia region, which may also have created a domestic production limitation. Markus Wagner, "WTO Law and the Right to Regulate: China – Rare Earths," 18:10 ASIL Insights (April 28, 2014) <https://www.asil.org/insights/volume/18/issue/10/wto-law-and-right-regulate-china-%E2%80%93-rare-earths> accessed 30 May 2016.

[129] Congressional Research Service, "Rare Earth Elements: The Global Supply Chain," (16 December 2013) 19 <www.fas.org/sgp/crs/natsec/R41347.pdf> accessed 12 January 2014.

[130] Congressional Research Service, "Rare Earth Elements: The Global Supply Chain," (16 December 2013) 19 <www.fas.org/sgp/crs/natsec/R41347.pdf> accessed 12 January 2014. The disparity may be the result of stolen raw materials subsequently sold on the black market, a frequent problem in China.

Bill Byrd, CEO and Chairman of Vancouver-based rare earths mining company Medallion Resources Ltd. stated: "I believe China is most interested in supplying its domestic needs first, hence the export quotas. However, because there's such a wide range of products that use rare earths, its domestic rare earths product industry is growing rapidly. China's doing everything it can to bring new investment into the country and develop new industries to use this material; for example, it will sell rare earths to local industries at a much cheaper price than it sells the same material to sources outside of China. In that sense, it's trying to do everything it can to increase the country's internal need."[131]

At the time these actions occurred, China dominated the world's production of rare earths, accounting for about 95% of the rare earth metals market.[132] The 2010 export restrictions heavily impacted the rare earths market. Average prices for rare earths increased 1100% between fourth quarter 2009 and the end of 2011, while prices for the more common rare earth oxides, cerium, lanthanum, praseodymium and neodymium, rose 1000%.[133] Additionally, prices for domestic use of China's rare earths were 50% or less than export prices.[134]

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[131] Sally Lowder, "REE Supply Hysteria," The Gold Report (17 December 2010) <http://www.theaureport.com/pub/na/8138> accessed 16 February 2014.
[132] United States Geological Survey, "The Principal Rare Earth Elements Deposits of the United States—A Summary of Domestic Deposits and a Global Perspective," Scientific Report 2010-5220 (2010) 15 <http://pubs.usgs.gov/sir/2010/5220/pdf/SIR2010-5220.pdf> accessed 3 November 2013; Congressional Research Service, "Rare Earth Elements: The Global Supply Chain," (16 December 2013) 11, 16 <www.fas.org/sgp/crs/natsec/R41347.pdf> accessed 12 January 2014.
[133] Molycorp 2012 Annual Report 22 (citing Metal-Pages) <http://www.molycorp.com/wp-content/uploads/Molycorp-Year-End-Reivew-2012.pdf> accessed 3 November 2013; Congressional Research Service, "Rare Earth Elements: The Global Supply Chain," (16 December 2013) 7 <www.fas.org/sgp/crs/natsec/R41347.pdf> accessed 12 January 2014 (citing prices for Dysprosium, for example, going from $110/kg in 2008 to $250-$300/kg in 2010 to $2,000-$3,000/kg in 2011).
[134] Roderick G. Eggert, Colorado School of Mines, April 16-20, 2012 Lectures in Germany PowerPoint Presentation, "Rare Earths and Other Critical Elements: A U.S. Perspective on Availability and Public Policy," 24 (citing metal-pages.com)

China's export restrictions attracted a lot of attention, mostly negative. National governments expressed concern and displeasure over China's actions. The United States Department of Energy prepared and issued a Critical Materials Strategy in December 2010, noting China controlled about 95% of the rare earths market, and finding that products reliant upon rare earths, such as magnets and batteries, were "at risk of supply disruptions."[135] The Critical Materials Strategy recommended, among other actions, developing domestic supply and working closely with partners in Europe and Japan (*not* China) to stabilize the rare earths market. Following release of the Critical Materials Strategy, the United States convened conferences with the European Union, Japan and guests from Canada and Australia (not China) on strategies for rare earth supplies in 2011.[136] U.S. Department of Energy assistant secretary David Sandalow told conference attendees in Washington D.C., "[r]eopening domestic production is an important part of a globalised supply chain."[137] The U.S. Congress also became concerned, especially due to national defense needs for rare earths. When Congress passed its 2011 Defense Authorization Act, it mandated the Department of Defense assess vulnerabilities

<http://inside.mines.edu/UserFiles/File/economicsBusiness/Misc%20PDFs/Eggert%20Germany%204%202012%20final.pdf> accessed 3 November 2013.

[135] United States Department of Energy, "Critical Materials Strategy Summary" (December 2010) <http://energy.gov/sites/prod/files/10_Critical_Materials_Strategy_Exec_Summary_final.pdf> accessed 3 November 2013.

[136] A trilateral conference was held in October 2011 in Washington D.C. between the United States, European Union and Japan with Canadian and Australian guests, <http://energy.gov/sites/prod/files/2013/05/f0/TRILATERAL_CRITICAL_MATERIALS_WORKSHOP_SummaryReportfinal%2020111129.pdf> accessed 3 November 2013, following a United States-Japan roundtable conference on rare earth elements research and technology in November 2010 at the Department of Energy's Lawrence Livermore National Laboratory, <http://energy.gov/sites/prod/files/piprod/documents/US_Japan_REE_agenda.pdf> accessed 3 November 2013.

[137] Suzanne Goldenburg, "Rare earth metals mine is key to US control over hi-tech future," The Guardian (26 December 2010).

associated with rare earths supply chain issues, and strategies have been recommended for protecting national defense, including stockpiling of materials.[138]

Exploration for and production of rare earth deposits also surged in response to China's actions, including explorations at four United States and three Canadian sites, three Australian sites and a site each in Malawi and South Africa.[139] Numerous other countries began assessments and exploration for rare earth resources in 2014, including no fewer than nine projects in the United States and additional projects in Australia, Brazil, Canada, China, Finland, Greenland, India, Kyrgyzstan, Madagascar, Malawi, Mozambique, Namibia, South Africa, Sweden, Tanzania, Turkey, and Vietnam.[140] Many mining products companies began investigating alternative source locations, including Stans Energy's partnership in Kyrgyzstan,[141] U.S. Rare Earths Inc.'s exploration in the United States (Idaho, Colorado and Montana),[142] a Japan-Jamaica joint venture,[143] a project at Kvanefjeld in Greenland,[144] and many others in Australia, Canada, South Africa, Vietnam, Oman and elsewhere.[145] In the "strange bedfellows" category, U.K.-based SRE Minerals was reportedly working with Australian experts in a new joint

[138] Valerie Bailey Grasso, "Rare Earth Elements in National Defense: Background, Oversight Issues, and Options for Congress" R41744 Congressional Research Service (23 December 2013) 4, 9. The Department of Defense has determined that it has sufficient stockpiles of rare earths for defense purposes.
[139] United States Geological Survey, Mineral Commodities Summary (January 2012) <http://minerals.usgs.gov/minerals/pubs/commodity/rare_earths/mcs-2012-raree.pdf> accessed 3 November 2013.
[140] United States Geological Survey, Mineral Commodities Summary (January 2012) 182-183 <http://minerals.usgs.gov/minerals/pubs/commodity/rare_earths/mcs-2012-raree.pdf> accessed 3 November 2013.
[141] Stans Energy <http://www.stansenergy.com> accessed 3 November 2013.
[142] US Rare Earths <http://www.usrareearths.com> accessed 3 November 2013.
[143] Esther Tanquintic-Misa, "Commodities Update: Jamaica Opens Rare Earths Extraction Plant; Greenland Allows Uranium Mining," International Business Times (28 October 2013).
[144] Greenland Minerals and Energy Ltd. <http://www.ggg.gl> accessed 3 November 2013.
[145] Congressional Research Service, "Rare Earth Elements: The Global Supply Chain" (16 December 2013) 19 <www.fas.org/sgp/crs/natsec/R41347.pdf> accessed 12 January 2014.

venture to develop rare earth element deposits in Jongju, north of Pyongyang, North Korea, including development of an on-site processing plant.[146] With government encouragement, the Mountain Pass rare earths mine owned by Molycorp began steps towards re-opening almost immediately after China's actions. Molycorp refitted the Mountain Pass mine with new mining and processing equipment along with new environmentally protective processes, becoming fully operational in 2013 and spending nearly $1.5 billion in the process.[147] Molycorp was slowly increasing production while the rare earths market continued to recover from depressed prices and the 2008 global economic downturn, but when China and EU economies slowed in 2015 the company was forced to file for bankruptcy.[148] Former Molycorp chief executive Mark Smith, giving a reporters' tour of the re-opening mine in 2010, stated "[w]e will probably never be the largest [mine] in the world again. It will be hard to overcome China's status in that regard, but we do think we will be a very significant supplier."[149] While rare earths market fluctuations continue, global demand now and in the future is likely sufficient to support several major rare earths mines around the world. Former rare earths expert for the U.S. Geological Survey Jim Hedrick stated, "[y]ou would need seven mines the size of Molycorp's just to meet the demand for wind turbines and that would mean no neodymium for motors or any other applications."[150]

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[146] Staff Writer, "Rare Earth Discovery Puts North Korea on the Map," Rare Earth Investing News (10 February 2014) <http://rareearthinvestingnews.com/19612-north-korea-sre-minerals-rare-earths-jongju.html> accessed 16 February 2014.
[147] Molycorp 2012 Annual Report 8 <http://www.molycorp.com/wp-content/uploads/Molycorp-Year-End-Reivew-2012.pdf> accessed 3 November 2013.
[148] Molycorp 2012 Annual Report 8, 20 <http://www.molycorp.com/wp-content/uploads/Molycorp-Year-End-Reivew-2012.pdf> accessed 3 November 2013.
[149] Suzanne Goldenburg, "Rare earth metals mine is key to US control over hi-tech future," The Guardian (26 December 2010).
[150] Suzanne Goldenburg, "Rare earth metals mine is key to US control over hi-tech future," The Guardian (26 December 2010).

Global consumers of rare earths also reacted negatively to China's actions. In the immediate wake of China's actions, private companies and governments such as the U.S. and China began stockpiling rare earth products.[151] This stockpiling initially contributed to skyrocketing prices, but then led to reductions in demand and price for rare earths, further destabilizing the rare earths market. Rare earths consumers also actively sought alternate technologies that do not require rare earth elements, called industrial substitution.[152] U.S.-based manufacturer General Electric's head of global research Steve Duclos stated, "[w]hat we are going to absolutely have to do is diversify our sources and optimize the use of these materials in manufacturing."[153] In Japan, manufacturing giant Hitachi started a recycling effort to recover rare earths from hard drives and other materials.[154]

Unsurprisingly, the governments of the United States, European Union and Japan also filed a complaint with the World Trade Organization (WTO) on March 13, 2012 over China's rare earths export controls.[155] The WTO dispute is discussed later in this thesis.

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[151] Molycorp 2012 Annual Report 22 <http://www.molycorp.com/wp-content/uploads/Molycorp-Year-End-Reivew-2012.pdf> accessed 3 November 2013; United States Geological Survey, "Mineral Commodity Summaries 2015," <http://minerals.usgs.gov/minerals/pubs/mcs/> accessed 15 February 2015; Keith Bradsher, "Amid Tension, China Blocks Vital Exports to Japan," New York Times (22 September 2010), <http://www.nytimes.com/2010/09/23/business/global/23rare.html?pagewanted=all&_r=1&> accessed 15 February 2015.

[152] Molycorp 2012 Annual Report 22 <http://www.molycorp.com/wp-content/uploads/Molycorp-Year-End-Reivew-2012.pdf> accessed 3 November 2013.

[153] Suzanne Goldenburg, "Rare earth metals mine is key to US control over hi-tech future," The Guardian (26 December 2010).

[154] Suzanne Goldenburg, "Rare earth metals mine is key to US control over hi-tech future," The Guardian (26 December 2010).

[155] Li Jiabao and Wang Zhuoqiang, "Ministry Opposed Disclosure of WTO Report on Rare Earth Disputes," China Daily USA (1 November 2013) <http://usa.chinadaily.com.cn/china/2013-11/01/content_17072695.htm> accessed 3 November 2013 (citing Financial Times article); Esther

Since 2010, the Chinese government has continued to take actions that affect the rare earths market. China is reportedly imposing environmental restrictions on the domestic rare earths industry, engaged in then withdrew from speculative purchasing of rare earths on the market, and seeks to force industry consolidation and further constrict rare earths production.[156] China's Ministry of Finance continues to toggle with export and import limits on rare earths.[157] Export restrictions impact the ability of manufacturers outside China to obtain sufficient rare earth products, while import restrictions impact the ability of China-based domestic and foreign operations to secure sufficient rare earth products to use in technology product production. These actions, combined with global economic weakness and consumer conservation in purchasing with falling rare earths prices, continues to significantly impact the rare earths market. As a result, Molycorp's Mountain Pass mine, which was gearing up for full production by 2013, was initially forced to curtail efforts due to slow market demand, high costs and prices of its rare earths, lack of financing and resulting minimal financial returns have changed those plans.[158] These conditions did not improve and, as mentioned, Molycorp filed for bankruptcy reorganization in 2015.

Governments and industry share concerns about the stability of the rare earths market. Stability concerns arise in three broad categories: geochemical scarcity, insecure

Tanquintic-Misa, "China's Rare Earths Export Restrictions Defy WTO Rules," International Business Times (31 October 2013).

[156] Molycorp 2012 Annual Report 22 <http://www.molycorp.com/wp-content/uploads/Molycorp-Year-End-Reivew-2012.pdf> accessed 3 November 2013.

[157] Molycorp 2012 Annual Report 22-24 <http://www.molycorp.com/wp-content/uploads/Molycorp-Year-End-Reivew-2012.pdf> accessed 3 November 2013.

[158] Molycorp 2012 Annual Report 22 <http://www.molycorp.com/wp-content/uploads/Molycorp-Year-End-Reivew-2012.pdf> accessed 3 November 2013.

supply, and increasing but volatile commercial demand.[159] Volatile demand occurred in part due to the 2008 global economic crisis, causing rare earths market prices to decrease by 50% between 2008 and the third quarter of 2009.[160] Insecure supply was created by China's "severe contraction" in rare earth exports beginning in 2010, discussed above. Geochemical scarcity is a result of the natural processes creating scarce commercially viable rare earth deposits for mining. This instability contributes to volatile market prices and supply disruptions, [161] including a record peak in prices in 2011 following China's actions, despite the global economic crisis, and plunging prices since then, causing mine slow-downs and halting mine explorations. Despite this instability, demand is expected to grow in the near future. World demand for rare earths was estimated at 136,100 tons in 2010.[162] The estimated demand growth in the next two decades is between 5% and 8.6% annually.[163] China's production and export controls, the growth of the middle class in Asia and elsewhere, increasing technology demands,

[159] Roderick G. Eggert, Colorado School of Mines, April 16-20, 2012 Lectures in Germany PowerPoint Presentation, "Rare Earths and Other Critical Elements: A U.S. Perspective on Availability and Public Policy," 24 (citing metal-pages.com) <http://inside.mines.edu/UserFiles/File/economicsBusiness/Misc%20PDFs/Eggert%20Germany%204%202012%20final.pdf> accessed 3 November 2013.

[160] Molycorp 2012 Annual Report 6-7, 22 <http://www.molycorp.com/wp-content/uploads/Molycorp-Year-End-Reivew-2012.pdf> accessed 3 November 2013.

[161] Roderick G. Eggert, Colorado School of Mines, April 16-20, 2012 Lectures in Germany PowerPoint Presentation, "Rare Earths and Other Critical Elements: A U.S. Perspective on Availability and Public Policy," 24 (citing metal-pages.com) <http://inside.mines.edu/UserFiles/File/economicsBusiness/Misc%20PDFs/Eggert%20Germany%204%202012%20final.pdf> accessed 3 November 2013.

[162] Congressional Research Service, "Rare Earth Elements: The Global Supply Chain" (16 December 2013) 3 <www.fas.org/sgp/crs/natsec/R41347.pdf> accessed 12 January 2014. The 2008 economic crisis made metal markets extremely volatile, and future demand estimates are equally unpredictable.

[163] Elisa Alonso, Massachusetts Institute of Technology, "Evaluating Rare Earth Element Availability: A Case With Revolutionary Demand From Clean Technologies," Environmental Science & Technology 46:6 (3 February 2012) 3406–3414 (putting 2010 demand at just over 100,000 tons, not the cited 136,000 tons).

and technology advances all make it difficult to determine whether this global demand will be met and the rare earths market with stabilize over time.[164]

3. Copper Mining

Copper is the reddish-brown shiny metal familiar to anyone who ever looked at electrical wires inside a house. However, copper is also one of the best conductors of electricity, and copper wires are used to transmit electricity from power sources to power users such as factories, homes and offices.[165] Copper also does not substantially react to air or water, and is a soft pliable metal such that it can be formed into thin wire.[166] It is estimated that the electrical wires under large cities such as New York City contain as much copper as some entire copper mines.[167] About three-fourths of all copper is used in electrical applications.[168] Global technological growth relies heavily on electrical wires and circuits, making copper a crucial metal to the technology revolution.

Although crucial to technology and electricity-based products, copper has been used for thousands of years, dating before the bronze age, and copper mines exist all over the ancient and modern worlds. Likewise, copper has been a traded commodity for hundreds of years, and the copper market is very well-established and mature.[169] Copper

[164] Congressional Research Service, "Rare Earth Elements: The Global Supply Chain" (16 December 2013) 4-6 <www.fas.org/sgp/crs/natsec/R41347.pdf> accessed 12 January 2014. The 2008 economic crisis made metal markets extremely volatile, and future demand estimates are equally unpredictable.
[165] Albert Stwertka, *A Guide to the Elements* (2nd Ed. Oxford University Press 2002) 96.
[166] Albert Stwertka, *A Guide to the Elements* (2nd Ed. Oxford University Press 2002) 96-97. Copper is named from the Latin *cuprum*, or "from Cyprus," where ancient Romans originally sourced the metal for decorative uses – its softness made it unsuitable for weaponry. Its use to create bronze came later.
[167] Albert Stwertka, *A Guide to the Elements* (2nd Ed. Oxford University Press 2002) 96.
[168] United States Geological Survey, "Copper Statistics and Information" (20 February 2015) <http://minerals.usgs.gov/minerals/pubs/commodity/copper/index.html> accessed 28 February 2015.
[169] Copper is a traded commodity on the London Exchange, COMEX and elsewhere. Metal Prices: Copper <http://www.metalprices.com/metal/copper> accessed 22 August 2015.

is also readily recyclable and reusable, indeed theft of copper inside electrical wires for sale and reuse is a common problem in the United States and elsewhere.[170]

Copper in the earth is actually somewhat rare, making up just 0.007 percent of the Earth's crust, compared to iron which makes up an estimated 5% of the Earth's crust.[171] Copper is a naturally occurring element in the Earth, and must be mined, typically in open-pit mines.[172] Copper is not often found in its pure form, rather it is found in ores (rocks), and this ore must go through a multi-stage process including roasting and electrolysis to obtain the small percentage of copper inside.[173] Acid leaching of oxidized ores also is increasingly used.[174] The copper content in the mined ore is so small that an estimated 98% of the mined ore is waste, and much of this waste as well as the processing chemicals are harmful to human health and the environment.[175]

Waste handling is a major issue for copper mines. Waste rock can be used on-site for roadways and embankments, can be sold as aggregate for roadways or other construction projects, and can be used as back-fill when the mine is closed.[176] The other type of

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[170] Erika Butler, "Two Charged In Theft of More Than 5 Miles of Copper Wire in Northern Harford," Baltimore Sun (2 October 2014) <http://www.baltimoresun.com/news/maryland/harford/fallston-joppa/ph-ag-copper-wire-theft-1022-20141021-story.html> accessed 22 August 2015.

[171] Albert Stwertka, *A Guide to the Elements* (2nd Ed. Oxford University Press 2002) 97; United States Geological Survey, "Iron Ore Statistical Compendium" (11 January 2013) <http://minerals.usgs.gov/minerals/pubs/commodity/iron_ore/stat/index.html> accessed 28 February 2015. Iron itself is too soft for industrial use. Iron ore is mined then smelted to remove carbon and create steel, which is used for building construction and other uses. The iron smelting process produces carbon monoxide and carbon dioxide as by-products, both of which are harmful to human health and the environment.

[172] Albert Stwertka, *A Guide to the Elements* (2nd Ed. Oxford University Press 2002) 97.

[173] Albert Stwertka, *A Guide to the Elements* (2nd Ed. Oxford University Press 2002) 97.

[174] United States Geological Survey, "Copper Statistics and Information" (20 February 2015) <http://minerals.usgs.gov/minerals/pubs/commodity/copper/index.html> accessed 28 February 2015.

[175] Kenneth E. Porter and Donald I. Bleiwas, United States Geological Survey, "Physical Aspects of Waste Storage from a Hypothetical Open Pit Porphyry Copper Operation," Open-File Report 03-143 (2003) 10 <http://minerals.usgs.gov/minerals/pubs/commodity/copper/> accessed 28 February 2015.

[176] Kenneth E. Porter and Donald I. Bleiwas, United States Geological Survey, "Physical Aspects of Waste Storage from a Hypothetical Open Pit Porphyry Copper Operation," Open-File Report 03-143 (2003) 12-13

copper mine waste, mill tailings, which is the liquid-solid slurry mixture leftover from ore processing, must be handled properly to avoid environmental damage from acid and potentially harmful dissolved metals.[177] As the United States Geological Survey states: "Problems [in waters] that can be associated with mine drainage include contaminated drinking water, disrupted growth and reproduction of aquatic plants and animals, and the corroding effects of the acid on parts of infrastructures such as bridges."[178] The most acidic water ever measured, on a range of 0 to 14 with 7 being normal, was negative 3.6, off the scale negative, measured in the water leaching from the Iron Mountain underground mine in California, now a national environmental cleanup "superfund" site.[179] Estimated costs to remediate acidic mine drainage-related problems using current technology in a similar area in the Appalachian Mountains coal mining area is estimated at $5 to $15 billion USD.[180]

Federal, state and local regulations in the U.S. and elsewhere impact waste disposal options, as does public perception and the work on non-governmental organizations, all of which can have a major impact on mine siting, operations, and waste

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<http://minerals.usgs.gov/minerals/pubs/commodity/copper/> accessed 28 February 2015. Because waste rock has been handled and treated, it has environmental degradation effects, such as leaching chemicals and metals.

[177] Kenneth E. Porter and Donald I. Bleiwas, United States Geological Survey, "Physical Aspects of Waste Storage from a Hypothetical Open Pit Porphyry Copper Operation," Open-File Report 03-143 (2003) 20 <http://minerals.usgs.gov/minerals/pubs/commodity/copper/> accessed 28 February 2015. Most mill tailings slurries are contained on site in impoundment ponds behind impoundment dams. The design and strength of the impoundment is crucial. Mill tailings typically contain sulfuric and other acids as well as dissolved metals such as iron.

[178] USGS Water Science School, United States Geological Survey, "Mining and Water Quality" (17 March 2014) <http://water.usgs.gov/edu/mining-waterquality.html> accessed 28 February 2015.

[179] USGS Water Science School, United States Geological Survey, "Mining and Water Quality" (17 March 2014) <http://water.usgs.gov/edu/mining-waterquality.html> accessed 28 February 2015.

[180] USGS Water Science School, United States Geological Survey, "Mining and Water Quality" (17 March 2014) <http://water.usgs.gov/edu/mining-waterquality.html> accessed 28 February 2015.

disposal choices.[181] A further complicating factor is that mill tailings and waste rock handling or disposal are decades-long issues, going on much longer than the active use of the mine or even longer than the mine company itself.[182] Chile is by far the largest producer of mined copper, followed by China, Peru, United States, Congo, Australia and many other countries.[183] Of course, some countries have more environmental protection regulations and better enforcement than others. Despite the environmental and human health risks, copper mining has been increasing worldwide. Mined unrefined copper production is expected to increase 6.7% in 2015 to 19,816 million metric tons, while copper demand is expected to increase 1.1% to 22,692 million metric tons.[184] The copper market experienced the same early 2010s severe downturn that all mining experienced, but there is some speculation that the bottom was reached and, absent a major economic problem, copper may be on the road to a comeback.[185]

The copper mining industry is dominated by a few major publicly traded, privately held, or government-owned companies, including the world's largest copper

[181] Kenneth E. Porter and Donald I. Bleiwas, United States Geological Survey, "Physical Aspects of Waste Storage from a Hypothetical Open Pit Porphyry Copper Operation," Open-File Report 03-143, pp. 13-14, 2003 <http://minerals.usgs.gov/minerals/pubs/commodity/copper/> accessed 28 February 2015.
[182] Kenneth E. Porter and Donald I. Bleiwas, United States Geological Survey, "Physical Aspects of Waste Storage from a Hypothetical Open Pit Porphyry Copper Operation," Open-File Report 03-143 (2003) 20 <http://minerals.usgs.gov/minerals/pubs/commodity/copper/> accessed 28 February 2015.
[183] United States Geological Survey, "Mineral Commodity Summaries 2015" 48 <http://minerals.usgs.gov/minerals/pubs/mcs/> accessed 15 February 2015; Copper Investing News, "Top 10 Copper Producing Companies" <http://copperinvestingnews.com/9405-top-10-copper-producing-companies.html> accessed 28 February 2015. Copper also is recycled in large quantities, but recycled copper is not considered here.
[184] International Copper Study Group, "Copper Market Forecast 2014-2015" (14 October 2014) <http://www.icsg.org/index.php/component/jdownloads/viewdownload/113/1960> accessed 28 February 2015. According to the ICSG report, China accounts for 40% of global copper demand. The difference between the mine production and demand is made up for by an increase in refined copper production as well as a global surplus or balance of refined copper.
[185] Agnieszka De Sousa and Eddie Van Der Walt, "Four Charts Show Why Copper's Comeback Could Have Staying Power," Bloomberg News (2 March 2016) <http://www.bloomberg.com/news/articles/2016-03-03/four-charts-show-why-copper-s-comeback-could-have-staying-power> accessed 6 March 2016.

producer and Chilean-government owned Codelco (2014 - 1.84 million tons), NYSE-listed and Phoenix Arizona-based Freeport-McMoRan (2014 – 1.47 million tons), London-listed multi-national Glencore (2014 – 1.3 million tons), Australian-based and publicly listed BHP Billiton (2014 – 1.2 million tons), Mexico-based and NYSE-listed Southern Copper (2014 – 665,000 tons), London-listed Rio Tinto (2014 – 636,000 tons), Poland-based KGMH (2014 – 506,000 tons), London-listed Anglo American (2014 – 504,000 tons), Chile-based and London-listed Antofagasta (2014 – 455,000 tons).[186] Most of these mining corporations are publicly-listed shareholder companies, meaning they are subject to reporting requirements and increased oversight of their business activities, lending transparency to their copper and other mining operations and providing potential pressure points for sustainable development efforts from shareholders, interest groups and the general public. Of these nine major copper producers, an impressive seven are also International Council on Mining and Metals members (discussed below), representing 86% of the top copper producers' 2014 production.

Mining Industry and Sustainable Development: Shortcomings

The mining industry has some unique characteristics that make it a prime candidate for sustainable development initiatives. As the World Economic Forum acknowledges: "The project life cycle for mining and metals operations can easily exceed 50 years. In addition, operations are fairly static: if the working environment becomes unsatisfactory, operations cannot be easily moved. Consequently, mining and

[186] Copper Investing News, "Top 10 Copper Producing Companies" <http://copperinvestingnews.com/9405-top-10-copper-producing-companies.html> accessed 28 February 2015.

metals companies are accustomed to investing time and money in developing long-term plans and forecasts, and effective planning helps them to protect their assets."[187] While this lengthy project life cycle makes change sometimes slow and difficult, it also promises to provide benefits for decades to come if sustainable development measures are integrated into mining company projects and operations.

Additionally, while sustainable development efforts are commonly viewed as an additional cost, analysis appears to show that the costs of sustainable development efforts is offset by productivity gains, meaning the costs of mining company sustainable development programs have strong returns on investment, which should encourage mining companies and their investors to adopt and promote sustainable development programs.[188] Also, generally speaking, mining companies strongly prefer predictable political environments and will maintain operations in such predictable environments rather than move into unstable or unpredictable environments in conflict-laden or developing countries, and good governance and reduced corruption are two aspects of sustainable development.[189] Furthermore, Rio Tinto's David Humphreys suggests the "pollution haven" theory that higher environmental regulations and associated costs have hampered the mining industries in developed countries such as the U.S. and Canada may be a myth, because evidence suggests the slow-down of the mining sectors in these

[187] World Economic Forum, "Scoping Paper: Mining and Metals in a Sustainable World" (2013) <http://www.weforum.org/reports/scoping-paper-mining-and-metals-sustainable-world> accessed 28 February 2015.
[188] David Humphreys (Rio Tinto), "Viewpoint: Sustainable development: can the mining industry afford it?" Resources Policy 27:1 (March 2001) 1-7 <http://www.sciencedirect.com/science/article/pii/S0301420701000034> accessed 27 January 2016.
[189] David Humphreys (Rio Tinto), "Viewpoint: Sustainable development: can the mining industry afford it?" Resources Policy 27:1 (March 2001) 1-7 <http://www.sciencedirect.com/science/article/pii/S0301420701000034> accessed 27 January 2016.

developed countries was more likely due to increased competition from more mining projects coming online in post-Cold War stabilized developing countries.[190] Companies with sustainable development programs also may use them to generate a stronger "social license to operate,[191]" ultimately increasing the company's access to capital investments and raw natural resources compared to other mining companies with poor sustainability records.

Select mined products such as copper and rare earths, in their own right, play an integral role in sustainable development with the "green economy." The "green economy" promises to be low carbon, resource efficient and socially inclusive, according to the United Nations Environment Programme (UNEP).[192] More expansively, "a green economy is one whose growth in income and employment is driven by public and private investments that reduce carbon emissions and pollution, enhance energy and resource efficiency, and prevent the loss of biodiversity and ecosystem services."[193] The UNEP

[190] David Humphreys (Rio Tinto), "Viewpoint: Sustainable development: can the mining industry afford it?" Resources Policy 27:1 (March 2001) 1-7 <http://www.sciencedirect.com/science/article/pii/S0301420701000034> accessed 27 January 2016.
[191] Business Council of British Columbia, "Rethinking Social Licence to Operate: A Concept in Search of Definition and Boundaries," Environment and Energy Bulletin 7:2 (May 2015) <http://www.bcbc.com/content/1708/EEBv7n2.pdf> accessed 10 July 2017. The article notes the large number of mining companies using the phrase "social license to operate" in public communications despite a lack of clear definition or meaning, and attributes the phrase's origins to a mining executive's speech to the World Bank in 1997. The phrase generally is thought to reference stakeholder, local community and/or broad societal acceptance for certain business activity.
[192] United Nations Environment Programme Green Economy Initiative (GEI) <http://www.unep.org/greeneconomy/AboutGEI/WhatisGEI/tabid/29784/Default.aspx> accessed 15 August 2015.
[193] United Nations Environment Programme Green Economy Initiative (GEI) <http://www.unep.org/greeneconomy/AboutGEI/WhatisGEI/tabid/29784/Default.aspx> accessed 15 August 2015.

estimates that the global market in low-carbon and energy efficient technologies is projected to be valued at $2.2 trillion (USD) by 2020.[194]

Despite all of these characteristics that make the mining industry a promising field for sustainable development initiatives, and despite the fact that select mined products such as copper and rare earths are by themselves quite useful for meeting sustainable development goals, public international institutions are rarely if ever working with, or taking on, the mining industry. As discussed later, this cold shoulder to the mining industry may be based on the industry's history as a "dirty" industry, distrust of the industry, lack of capacity by public international institutions, fear of putting efforts towards a volatile industry subject to large market swings, pressure from NGOs or many other causes. Regardless of the causes, the lack of attention paid by public international institutions to the mining industry is opportunity lost for sustainable development.

While public international institutions largely ignore the mining industry, as discussed in later chapters, multiple international NGOs have targeted the mining industry for decades of criticism, much deserved. Oxfam highlights the lack of transparency in the mining industry, including secret payments, secret contracts and "opaque" government budgets, as contributing to corruption, conflict and environmental degradation in resource-rich developing countries.[195] The International Union for the Conservation of Nature (IUCN) highlights mining industry environmental threats in

[194] United Nations Environment Programme Green Economy Initiative (GEI) <http://www.unep.org/greeneconomy/AboutGEI/WhatisGEI/tabid/29784/Default.aspx> accessed 15 August 2015.

[195] Oxfam International, "Many countries failing test of political will to implement oil and mining industry anti-corruption initiative" (9 March 2010) <http://www.oxfam.org/en/pressroom> accessed 28 February 2015. Notably, when searching Oxfam International's website for "mining," very few articles result, this cited article dates back to 2010, and no articles were found for later years.

world heritage sites.[196] IUCN has engaged in dialogue and some cooperative presentations with the International Council on Mining and Metals (ICMM), although little information is provided on these cooperative efforts. Human Rights Watch has reported on displaced indigenous persons and communities as well as lack of social improvements such as poverty alleviation from mining operation revenues and taxes paid to national governments.[197] Global Witness reports on "sweetheart" mining rights deals between the Congolese national government and private offshore companies based in British Virgin Islands reportedly owned by a personal friend of the Congolese president, who then sold the mining rights to large London-listed mining companies Eurasian Natural Resources Corporation and Glencore, estimating the Congolese government lost over $1 billion USD in national mining proceeds in the corrupt process.[198]

The mining industry has largely brought this criticism upon itself, willingly working in countries known to be lacking adequate institutions and processes for protection of human health and environment,[199] sometimes taking or damaging land of

[196] International Union for the Conservation of Nature, "Mining threats on the rise in World Heritage sites" (27 June 2011) <http://www.iucn.org/knowledge/news/?7742/Mining-threats-on-the-rise-in-World-Heritage-sites> accessed 28 February 2015. A search of IUCN's website for "mining" yields results similar to the search of Oxfam International's website, with few articles or other results and no results for 2014 or 2015.

[197] Nisha Varia, Human Rights Watch, "Mozambique's Mining Boom Damns the Poorest" (14 October 2014) <http://www.hrw.org/news/2014/10/14/mozambiques-mining-boom-damns-poorest> accessed 28 February 2015; Human Rights Watch, "How Can We Survive Here? The Impact of Mining on Human Rights in Karamojo, Uganda" <http://www.hrw.org/reports/2014/02/03/how-can-we-survive-here-0> accessed 28 February 2015.

[198] Global Witness, "Congo's Secret Sales" (undated) <htpps://www.globalwitness.org/en/campaigns/oil-gas-and-mining/congo-secret-sales/> accessed 21 January 2016. Global Witness reports the Congolese President's friend Dan Gertler paid less than 5% of market value for mining rights in some instances. According to the Global Witness report, the IMF eventually halted its loan program to Congo over the scandal and the British Serious Fraud Office began investigating, which perhaps led Eurasian to de-list from the London exchange to avoid further scrutiny. The U.S. Securities and Exchange Commission is investigating other Gertler dealings with Congolese oil rights.

[199] Jonathan Head, BBC News, "Bauxite in Malaysia: The environmental cost of mining" (19 January 2016) <http://www.bbc.co.uk/news/world-asia-35340528> accessed 21 January 2016. The BBC reported on open pit mining for bauxite taking over rural palm oil and fruit tree plantation areas, with bauxite mining

local inhabitants without consultation or payment, and mining company revenues sometimes feeding corrupt governments if not outright acting in complicity with the corrupt government.[200] Most if not all mining companies know their activities impact human health and environment, but relatively few have taken significant steps towards safeguarding human health and environment throughout mining operations and afterwards. Glencore likely knew or should have known that corruption fed the Congolese president but failed to insist on payment transparency. In 2016, Malaysia imposed a mining ban after some 44 small bauxite mining companies purchased large areas of farm lands and converted it to open pit bauxite mines with little local population or national government oversight in a developing country known to be lacking either strict environmental and human health protections or a well-developed national mining law.[201] In December 2015, a Brazil federal judge froze assets of publicly-traded BHP Billiton and Brazil-based Vale mining companies after a mine tailings dam from a BHP-Vale joint venture broke and overran an entire town of some 600 people, killing at least 13 people and with regional environmental and property damages estimated at over $5 billion USD.[202]

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going from 200,000 tons in 2013 to 20 million tons in 2015, a 100-fold increase in two years, and making Malaysia a major supplier for China's large aluminum industry. Other bauxite producers include Australia, China, Brazil and India and formerly Indonesia (until it banned bauxite exports to boost its domestic aluminum industry). In Malaysia, the small companies purchased land or land leases directly from local landowners, right next to plantations, with no environmental and human health controls in place and only paying 5% royalty to the government. Malaysia just imposed a short-term moratorium on bauxite mining.

[200] Priscilla Schwartz, *Sustainable Development and Mining in Sierra Leone* (Pneuma Springs Publishing 2006).

[201] Jonathan Head, BBC News, "Bauxite in Malaysia: The environmental cost of mining" (19 January 2016) <http://www.bbc.co.uk/news/world-asia-35340528> accessed 21 January 2016.

[202] BBC News, "Brazil dam collapse: Judge blocks BHP Billiton and Vale assets" (19 December 2015) <http://www.bbc.co.uk/news/world-latin-america-35143098> accessed 21 January 2016.

The need to promote sustainable development in the mining industry is obvious. With this backdrop an immediate question arises -- how best to promote sustainable development in the global mining industry at the public international level?

Chapter Three

United Nations: Missed Opportunities

Introduction

This chapter begins to address the role public international institutions presently play in the mining industry. The United Nations is the most universally recognized public international institution, and has a clear mandate to act towards sustainable development, and thus is an obvious starting point. First in this chapter is an analysis of the role various United Nations institutions presently play in sustainable development efforts, followed by analysis of efforts towards sustainable development for the mining industry including copper and rare earths. The chapter concludes with analysis of the slight progress but significant short-comings in United Nations and related institutions' attention to sustainable development generally, and particularly in the mining industry as a whole.

United Nations: A Brief Overview

The United Nations was created in the wake of two destructive world wars and an intervening global economic depression. The Preamble to the United Nations Charter states the UN's purpose is in part to: "save succeeding generations from the scourge of war… to reaffirm faith in fundamental human rights … [and] to promote social progress and better standards of life in larger freedom."[203] The United Nations' primary function is to prevent war and address threats to peace.[204] War prevention has both a narrow

[203] United Nations Charter, Preamble (1945).
[204] Simon Chesterman, Thomas M. Franck, David M. Malone, Law and Practice of the United Nations (Oxford University Press 2008) 20.

view, eliminating threats to peace, and a broader view of addressing the socio-political and economic conditions that give rise to security threats.[205] The Cold War and its many regional conflicts and proxy wars led to focus on a mainly narrow view of war prevention through the 1970s.[206]

The decolonization of Africa, Latin American economic and political instability and other emerging post-Cold War challenges caused the United Nations to begin to assess its role beyond mere security threat management.[207] Following a Security Council Summit in 1992 to address Iraq's invasion of Kuwait, the Security Council issued a statement declaring, "peace and prosperity are indivisible and… lasting peace and stability require effective international cooperation for the eradication of poverty and the promotion of a better life for all in larger freedom."[208] The words "in larger freedom" intentionally echo the words of the 1945 United Nations Charter Preamble. The United Nations also convened a Millennium Summit in 2000, resulting in a Millennium Declaration focusing the United Nations towards development and poverty eradication, including adoption of the well-known Millennium Development Goals.[209] One of the outgrowths of the Millennium Declaration was creation of the High-Level Panel on Threats, Challenges and Change, which recognized six clusters of threats, largely focused on war, civil war, terrorism and their instruments, with minor emphasis on

[205] Simon Chesterman, Thomas M. Franck, David M. Malone, Law and Practice of the United Nations (Oxford University Press 2008) 20.
[206] Simon Chesterman, Thomas M. Franck, David M. Malone, Law and Practice of the United Nations (Oxford University Press 2008) 21.
[207] Simon Chesterman, Thomas M. Franck, David M. Malone, Law and Practice of the United Nations (Oxford University Press 2008) 21.
[208] United Nations Security Council Statement, S/23500 (31 January 1992).
[209] United Nations General Assembly Resolution ("Millennium Declaration") 55/2 (2000).

human rights violations, poverty and environmental damage.[210] The High-Level Panel's attention on war and terrorism was understandable, given that shortly after the Millennium Summit the September 11, 2001 terrorist attacks in the United States and the resulting invasions in Afghanistan and Iraq again focused attention on narrow security issues.[211] The UN Charter Preamble words were invoked once more by Secretary General Kofi Annan in his report "In Larger Freedom," which again sought to re-focus the United Nations towards a broader view of security maintenance including development, poverty eradication and respect for human rights.[212] This report reaffirmed that "development, security and human rights [are] all imperative, they also reinforce each other… poverty and denial of human rights… greatly increase the risk of instability and violence… war and atrocities… undoubtedly set back development… terrorism… could affect the development prospects of millions."[213] The same report acknowledged the need for the United Nations itself to reform and become more transparent, efficient and effective.[214]

The United Nations, with near universal membership at 193 state members, is the most well-recognized public international organization, and has several programs and branches addressing the three legs of sustainable development -- development, society and the environment. These United Nations institutions are discussed next.

[210] United Nations documents, A/59/565 (2004). The High-Level Panel encouraged a focus on development to avoid the identified threats.
[211] Simon Chesterman, Thomas M. Franck, David M. Malone, Law and Practice of the United Nations (Oxford University Press 2008) 43.
[212] United Nations documents, A/59/2005 (2005).
[213] United Nations documents, A/59/2005 (2005) Para. 16.
[214] United Nations documents, A/59/2005 (2005) Para. 21.

United Nations' Key Institutions for Sustainable Development

1. Governing Entities – General Assembly, Security Council, Secretariat and ECOSOC

The primary institutions within the United Nations are the General Assembly, the Security Council, the Economic, Social and Cultural Council (ECOSOC), and the Secretariat with personnel to carry out UN work. Each is analyzed below as they relate to sustainable development.

While well-recognized and ubiquitous, the United Nations has little effective power to enforce resolutions on members.[215] The United Nations Security Council may adopt binding resolutions pursuant to Chapter VII proceedings relating to international peace and security, including withdrawal of diplomatic ties, economic sanctions and military intervention,[216] but in practice it rarely acts definitively based in large part on the veto power held by the five permanent members.[217] The United Nations General Assembly does not itself have the power to adopt binding resolutions except on procedural and budgetary matters of the United Nations.[218] Rather, the General Assembly works through adopting non-binding resolutions, convening conferences, creating investigative and other committees, endorsing principles and rules, recommending actions, and through the work of its Secretariat, headed by Secretary-General Ban Ki-moon until December 2016.[219]

[215] The International Court of Justice, created at the same time as and part of the United Nations, holds some decision-making and dispute resolution powers for disputes submitted to it by States, and can issue advisory opinions on referred subjects, but generally these are beyond the scope of this thesis.
[216] United Nations Charter, Chapter VII (1945).
[217] United Nations Charter, Article 27(3) (1945). Reform of the Security Council is a much-debated issue, but beyond the scope of this thesis.
[218] United Nations Charter, Articles 10, 14 (1945).
[219] Secretary-General Ban Ki-moon is completing his second five-year term in 2016, then new Secretary General Antonio Guterres assumes the post.

The Secretariat carries out its work through over a dozen departments and offices, each with dozens of sub-parts, including a department for economic and social affairs (UN-DESA) containing several divisions including one for sustainable development (DSD).[220] The division for sustainable development also has a High-Level Political Forum on Sustainable Development (HLPF-SD).[221] The HLPF-SD "provides political leadership, guidance and recommendations… follows up and reviews the implementation of sustainable development commitments and the 2030 Agenda for Sustainable Development [and] promotes the science-policy interface and enhances the integration of economic, social and environmental dimensions of sustainable development."[222] These functions appear to overlap with the stated work of the DSD, although the HLPF-SD meets only annually and every four years for heads of state. In addition to these, a separate United Nations Office for Sustainable Development (UNOSD) within the UN-DESA was established in 2011 by the United Nations and the Government of Republic of Korea, Secretary-General Ban Ki-moon's home country.[223] The UNOSD "supports U.N. Member States in planning and implementing sustainable development strategies, notably through knowledge sharing, research, training and

[220] United Nations Secretariat <http://www.un.org/en/sections/about-un/secretariat/index.html> accessed 27 January 2016. United Nations Division for Sustainable Development (DSD), available at <https://sustainabledevelopment.un.org/about> accessed 27 January 2016. The "work of the [DSD] translates into five core functions: (1) Support to UN intergovernmental processes on sustainable development; (2) Analysis and policy development; (3) Capacity development at the country level; (4) Inter-agency coordination; and (5) Knowledge management, communication and outreach."

[221] United Nations Secretariat <http://www.un.org/en/sections/about-un/secretariat/index.html> accessed 27 January 2016. United Nations High-Level Political Forum on Sustainable Development <https://sustainabledevelopment.un.org/hlpf> accessed 27 January 2016. The HLPF-SD was to replace ECOSOC's Commission on Sustainable Development. The United Nations previously had an Inter-Agency Committee for Sustainable Development to help coordinate agency activities, but this was abolished in 1998.

[222] United Nations High-Level Political Forum on Sustainable Development <https://sustainabledevelopment.un.org/hlpf> accessed 27 January 2016.

[223] United Nations Office for Sustainable Development <https://sustainabledevelopment.un.org/about/unosd> accessed 27 January 2016.

partnership building."[224] These functions appear to overlap with the work of the DSD itself, although the future of the UNOSD after Secretary General Ban Ki-moon's term ends remains to be seen. The Secretariat also carries out its work through several regional divisions, creating overlapping divisions along both regional and topical lines.

The other relevant original United Nations body is the Economic and Social Council (ECOSOC) created in 1945, ostensibly with primary authority for developing the United Nations agenda towards economic, social and environmental issues, including sustainable development.[225] ECOSOC claims this primary responsibility, however the claim conflicts with the stated purposes of the Secretariat's own various sustainable development offices. Carrying out ECOSOC's work is no less than nine functional commissions, five regional commissions, ten programmes and funds including the United Nations Development Programme and the United Nations Environment Programme, fifteen specialized agencies including the International Monetary Fund and World Bank (discussed in chapter five) as well as the International Labor Organization and the United Nations Industrial Development Organization (discussed below), and over a dozen smaller offices.[226] These over 50 sub-entities of ECOSOC have ill-defined responsibilities and boundaries, especially in the realm of a cross-disciplinary topic such as sustainable development. ECOSOC previously had its own Commission on Sustainable Development, created at the United Nations Conference on Environment and

[224] United Nations Office for Sustainable Development <https://sustainabledevelopment.un.org/about/unosd> accessed 27 January 2016.
[225] United Nations Economic and Social Council <https://www.un.org/ecosoc/en/about-us> accessed 27 January 2016.
[226] United Nations Economic and Social Council organigram <http://www.un.org/en/ecosoc/about/pdf/ecosoc_chart.pdf> accessed 27 January 2016.

Development (Rio 1992), which has now been replaced by the HLPF-SD by decision at the recent United Nations Sustainable Development ("Rio+20") Conference.[227]

In creating the HLPF-SD, the United Nations General Assembly secured a report of the former Commission's successes and failures.[228] Among the report's findings are "several shortcomings in the work of the Commission," including a "lack of success in fully integrating economic, social and environmental dimensions of sustainable development into its work and outcomes," inadequate monitoring and review of progress on agreements for implementing sustainable development goals, and overall its "review of and impact on implementation of sustainable development remained weak and it was not able to respond with sufficient flexibility to new and emerging issues."[229] Panel recommendation ten promotes working towards "shared success," while recommendation six proposes increased involvement of civil society and the private sector in its work, including "grass-roots" NGOs and small to medium business in developing countries.[230] The HLPF-SD is intended to provide political leadership and integration, improve coordination within and outside the United Nations towards advancing sustainable development goals, monitor progress towards sustainable

[227] United Nations General Assembly Outcome Document "Future We Want," A/RES/66/288 (11 September 2012) para. 84; United Nations Sustainable Development Knowledge Platform website <http://sustainabledevelopment.un.org/index.php?menu=1556> accessed 1 November 2014; Report of the Secretary-General, "Lessons Learned from the Commission on Sustainable Development," A/67/757 (26 February 2013) <http://www.un.org/ga/search/view_doc.asp?symbol=A/67/757&Lang=E> accessed 27 January 2016.
[228] Report of the Secretary-General, "Lessons Learned from the Commission on Sustainable Development," A/67/757 (26 February 2013) <http://www.un.org/ga/search/view_doc.asp?symbol=A/67/757&Lang=E> accessed 27 January 2016.
[229] Report of the Secretary-General, "Lessons Learned from the Commission on Sustainable Development," A/67/757 (26 February 2013) <http://www.un.org/ga/search/view_doc.asp?symbol=A/67/757&Lang=E> accessed 27 January 2016.
[230] Report of the Secretary-General, "Lessons Learned from the Commission on Sustainable Development," A/67/757 (26 February 2013) <http://www.un.org/ga/search/view_doc.asp?symbol=A/67/757&Lang=E> accessed 27 January 2016.

development goals, and address new challenges to sustainable development.[231] The HLPF-SD is envisioned as an improved mechanism towards these aims, although the results of this work and towards the post-2015 agenda and sustainable development goals will be judged in coming years.[232] The HLPF-SD's work thus far is visible in some key ways, with improved transparency and detailed plans of action and coordination with other agencies and actors,[233] and more candid assessments of the coordination accomplished.[234] However, it is unclear how the HLPF-SD or the many other United Nations entities working on sustainable development will effectively address the shortcomings identified in the Commission on Sustainable Development, especially since the HLPF-SD has only annual meetings and meetings with heads of state every four years.

2. UN Conference on Trade and Development

Setting aside the various machinations of the Secretariat and ECOSOC, there is the United Nations Conference on Trade and Development (UNCTAD), plodding quietly along and making demonstrable progress on certain aspects important to sustainable development. The UNCTAD was created in the 1960s to address the growing gap between developed and developing countries in the realm of international trade and

[231] United Nations website <http://sustainabledevelopment.un.org/unsystem.html> accessed 1 November 2014.
[232] United Nations General Assembly, "Report of the Open Working Group of the General Assembly on Sustainable Development Goals," A/68/970 (12 August 2014); United Nations General Assembly, Summary of the first meeting of the high-level political forum on sustainable development, A/68/588 (13 November 2013).
[233] United Nations Sustainable Development Knowledge Platform website <http://sustainabledevelopment.un.org/unsystem.html> accessed 1 November 2014.
[234] United Nations Economic and Social Council Governing Council, Report of the Secretary-General, "Mainstreaming of the three dimensions of sustainable development throughout the United Nations System," A/68/79 (9 May 2013).

development.[235] The first UNCTAD meeting was held in Geneva, 1964, and involved the simultaneous creation of the G77 group, a group of now 134 less-developed countries working together towards improved representation and negotiating strength for developing countries.[236] The role of the UNCTAD has morphed over time, navigating through the debt crises of the 1980s and globalization, and now focuses efforts towards policy development, economic statistical analysis and technical assistance for developing countries in the international trade and development realms. This is in keeping with the Report of the Panel of Eminent Persons titled Enhancing the Development Role and Impact of UNCTAD, recommending UNCTAD and other UN agencies focus on their core competencies and avoid duplication of tasks and efforts.[237] A major part of the Conference's work includes compiling statistics and data, such as the World Investment Report and the Trade and Development Report, which provides important information for decision-making in developing countries.[238]

Another part of UNCTAD's work, through its Division on International Trade and Commodities (DITC), involves advising and providing technical assistance to developing countries for sustainable development initiatives in the agricultural and non-agricultural economic sectors.[239] Technical assistance provided by the UNCTAD includes development of laws and policies, such as in the areas of investment, trade or technology, as well as the institutional framework and training necessary to enforce the

[235] UNCTAD website <http://unctad.org/en/Pages/About%20UNCTAD/A-Brief-History-of-UNCTAD.aspx> accessed 1 November 2014.
[236] G77 website <http://www.g77.org/doc/> accessed 1 November 2014.
[237] UNCTAD Report (June 2006) <unctad.org> accessed 15 November 2016.
[238] United Nations Conference on Trade and Development website <http://unctad.org/en/Pages/Publications.aspx> accessed 27 January 2016.
[239] United Nations Conference on Trade and Development website <http://unctad.org/en/Pages/DITC/Trade-and-Environment.aspx> accessed 1 November 2014.

laws and policies.[240] Additional types of technical assistance include analyses of trade barriers and non-tariff barriers to trade, WTO accession planning and trade agreement negotiation, sustainable biodiversity trade, carbon markets trading, and tourism development.[241] The Conference also works closely with the IMF and World Bank to provide technical assistance necessary for securing international loans and financing.[242] The UNCTAD does not directly address mining or sustainable development in the mining sector, but has a small Special Unit on Commodities and providing limited general capacity-building and technical assistance for commodities trade development.[243] Nor does the UNCTAD have any enforcement mechanisms, principally acting instead through technical assistance and provision of data.

3. UN Environment Programme

Perhaps the best known of the United Nations institutions relating strictly to the environment is the United Nations Environment Programme, based in Nairobi, Kenya, created as an outgrowth of the 1972 Stockholm Conference.[244] The UNEP has three main tasks: assessing environmental conditions and trends, developing international and

[240] United Nations Conference on Trade and Development, "Technical Assistance" <http://unctad.org/en/Pages/TechnicalCooperation.aspx> accessed 27 January 2016.
[241] United Nations Conference on Trade and Development, "A Guide to UNCTAD Technical Cooperation" (2009) <http://unctad.org/en/PublicationsLibrary/dom20092rev1_en.pdf> accessed 27 January 2016.
[242] United Nations Conference on Trade and Development, "A Guide to UNCTAD Technical Cooperation" (2009) <http://unctad.org/en/PublicationsLibrary/dom20092rev1_en.pdf> accessed 27 January 2016.
[243] United Nations Conference on Trade and Development, "A Guide to UNCTAD Technical Cooperation" (2009) <http://unctad.org/en/PublicationsLibrary/dom20092rev1_en.pdf> accessed 27 January 2016. Commodities constitutes only one page of this 60-page publication, indicating the relatively little work UNCTAD does in commodities. The Special Unit on Commodities produced several articles on mining and minerals-metals trade in the 1990s, but has produced little work since then except an Iron Ore Market Report in 2015.
[244] Report of the United Nations Conference on the Human Environment, A/CONF.48/14/REV.1 (16 June 1972) 29.

national environmental agreements, and supporting environmental institutions.[245] Towards the latter task, among other coordinating activities, the Uruguay Round of WTO negotiations noted existing and ongoing communication and cooperation between the UNEP and WTO secretariats, although no known tangible results of this cooperation are apparent.[246] Thus far, it appears the cooperation includes only attending each other's relevant meetings, and issuance of a 2015 press release stating they did so.[247] The UNEP has seven main program areas, including climate change, disasters, ecosystem management, environmental governance, chemicals and waste, resource efficiency and environmental review.[248] The UNEP also works through six regional offices as well as five main divisions, as with the UN Secretariat having overlapping topical and regional divisions. The UNEP also supports the secretariats for several multilateral environmental agreements (MEAs) such as the Convention on International Trade in Endangered Species (CITES) and the Convention on the Conservation of Migratory Species of Wild Animals (CMS).[249]

Notably, the UNEP does not typically use the phrase "sustainable development," but instead as part of its resource efficiency priority program refers to "sustainable consumption and production," acknowledging but omitting from its focus the economic

[245] United Nations Environment Programme website <http://www.unep.org/about/> accessed 1 November 2014.
[246] The limited cooperation and infrequent communication between the two entities is evident at World Trade Organization, "The WTO and United Nations Environment Programme" <https://www.wto.org/english/thewto_e/coher_e/wto_unep_e.htm> accessed 27 January 2016.
[247] World Trade Organization press release, "WTO and UNEP enhance dialogue on trade and environmental issues" (28 April 2015) <https://www.wto.org/english/news_e/pres15_e/pr741_e.htm> accessed 27 January 2016.
[248] United Nations Environment Programme website <http://www.unep.org/about/Priorities/tabid/129622/Default.aspx> accessed 1 November 2014.
[249] United Nations Environment Programme website <http://www.unep.org/about/Structure/tabid/129623/Default.aspx> accessed 1 November 2014.

and social development aspects of "sustainable development."[250] The UNEP's 2030 Agenda focuses on integration of the environment dimension in sustainable development and building country capacity.[251] Instead, the UNEP focuses its sustainability efforts towards resource efficiency, governmental capacity, partnerships with industry, and influencing consumer choice. The UNEP promotes clean and safe industrial production through its work with national governments, industry, and joint programs with other organizations such as the "Resource Efficiency and Clean Production" (RECP) initiative with UNIDO.[252]

With regard to clean and safe industrial production, the UNEP recognizes the shift of manufacturing to developing economies, often with fewer regulations and reduced enforcement ("pollution havens"), and commensurate increase in the risks of resource depletion, environmental pollution, industrial accidents and hazardous waste issues.[253] To address these risks, the UNEP encourages improved manufacturing processes, recycling, and improved environmental governance.[254] The UNEP indicates it

[250] United Nations Environment Programme website <http://www.unep.org/resourceefficiency/Home/UNEPsResourceEfficiencyProgramme/tabid/55552/Default.aspx> accessed 1 November 2014.
[251] United Nations Environment Programme, "United Nations Environment Programme and the 2030 Agenda" <http://www.unep.org/pdf/UNEP_and_the_2030_Agenda.pdf> accessed 16 November 2016.
[252] United Nations Environment Programme website <http://www.unep.org/resourceefficiency/Business/CleanerSaferProduction/ResourceEfficientCleanerProduction/UNEP-UNIDOjointRECPProgramme/RECPGlobalNetworkingConferences/tabid/794778/Default.aspx> accessed 1 November 2014.
[253] United Nations Environment Programme website, <http://www.unep.org/resourceefficiency/Business/CleanerSaferProduction/tabid/55543/Default.aspx> accessed 1 November 2014.
[254] United Nations Environment Programme website, <http://www.unep.org/resourceefficiency/Business/CleanerSaferProduction/tabid/55543/Default.aspx> accessed 1 November 2014.

has developed global initiatives for economic sectors including mining and metals, but little activity is identifiable in this area.[255]

As the United Nations' primary governing bodies and the next obvious candidate, the UNEP, do not directly address sustainable development in the mining industry, other United Nations-related agencies and programs also are considered. Several additional United Nations-related organizations incorporate aspects of sustainable development into their national capacity building efforts for developing countries, through technical assistance, advising and funding. These organizations include the United Nations Development Programme, United Nations Industrial Development Organization and the International Labor Organization.

4. UN Development Programme

The United Nations Development Programme (UNDP) was established by the United Nations General Assembly in 1965,[256] and now works in 150 countries with over half a billion dollars in assistance and funding for local and national sustainable development programs.[257] The UNDP's efforts fall into three categories, sustainable development, disaster preparedness and recovery, and democratic governance and peacebuilding.[258] With respect to sustainable development efforts, the UNDP principally

[255] United Nations Environment Programme website, <http://www.unep.org/resourceefficiency/Business/SectoralActivities/tabid/55545/Default.aspx> accessed 1 November 2014. The UNEP, as a programme rather than agency or special body, has limited financial resources, which may lead to limited activity in some areas such as mining.
[256] United Nations General Assembly Res. 2029 (XX) (1965).
[257] United Nations Development Programme, "UNDP's Work In Environment and Sustainable Development 2008-2012," (2013) 4 <http://www.undp.org/content/undp/en/home/ourwork/environmentandenergy/overview.html> accessed 8 November 2014.
[258] United Nations Development Programme, Overview <http://www.undp.org/content/undp/en/home/ourwork/overview.html> accessed 27 January 2016.

works with developing countries to promote and fund environmental protection programs and establish and implement inclusive development policies and programs.[259] The UNDP has an extractive industries bureau but until very recently, the UNDP did little with respect to the mining industry. However, this visibly changed in 2014 and 2015.[260]

First, the UNDP's Extractive Industries Bureau became re-energized and renewed its efforts towards working within the extractive industries arena. The UNDP began implementing its July 2013 "Strategy for Supporting Sustainable and Equitable Management of the Extractive Industries,"[261] which adopted a broad approach towards extractive industries, by (a) working with governments to strengthening governmental legal and institutional frameworks, negotiate and enforce beneficial extractive resource contracts, ensure extraction operations are environmentally and socially sustainable, and ensure revenues are properly reinvested,[262] (b) working with civil society, women's

[259] United Nations Development Programme, Sustainable Development <http://www.undp.org/content/undp/en/home/ourwork/sustainable-development/overview.html> accessed 27 January 2016.

[260] Gillian Davidson, Lisa Sachs and Casper Sonneson, United Nations Development Programme, "How can mining contribute to the Sustainable Development Goals?" (5 October 2015) <http://www.undp.org/content/undp/en/home/blog/2015/10/5/How-can-mining-contribute-to-the-Sustainable-Development-Goals-.html> accessed 27 January 2016. The article reports on the then-forthcoming publication "Mapping Mining to the Sustainable Development Goals: An Atlas."

[261] United Nations Development Programme, "Strategy for Supporting Sustainable and Equitable Management of the Extractive Sector for Human Development" (8 July 2013) <http://www.undp.org/content/undp/en/home/librarypage/poverty-reduction/inclusive_development/strategy-note--undps-strategy-for-supporting-sustainable-and-equ/> accessed 17 November 2016; United Nations Development Programme, Extractive Industries Bureau <http://www.undp.org/content/undp/en/home/ourwork/sustainable-development/natural-capital-and-the-environment/extractive-industries-.html> accessed 17 November 2016.

[262] United Nations Development Programme, "Extractive Industries for Sustainable Development: Global and Regional Activity Report 2015" <http://www.undp.org/content/dam/undp/library/Sustainable%20Development/Extractive_Industries-Activity_Report_2015.pdf> accessed 17 November 2016.

organizations, indigenous peoples and others affected by the extractive industries,[263] and (c) making efforts to engage the private sector to utilize environmental and social safeguards and integrate corporate social responsibility. Much of the documented work to date has focused on the first two categories, working with governments and civil society groups,[264] engaging the private sector appears to be slow so far.

Second, the UNDP worked with several other groups to produce a detailed publication recommending mining industry activities to be undertaken towards sustainable development, based in part on interviews with industry and other experts. Specifically, the UNDP worked with the Columbia Center on Sustainable Development, the UN Sustainable Development Solutions Network, the World Economic Forum and others to produce the white paper "Mapping Mining to the Sustainable Development Goals: An Atlas," submitted to the World Economic Forum in July 2016.[265] The foreword states:

> It is our shared belief that the mining industry has an unprecedented opportunity to mobilize significant human, physical, technological and financial resources to advance the SDGs. Mining is a global industry and is often located in remote, ecologically sensitive and less-developed areas that include many indigenous lands and territories. When managed appropriately, it can create jobs, spur innovation and bring investment and infrastructure at a game-changing scale over long time horizons. Yet, if managed poorly, mining can also lead to environmental degradation, displaced populations, inequality and increased conflict, among other

[263] United Nations Development Programme, "Extractive Industries for Sustainable Development: Global and Regional Activity Report 2015" <http://www.undp.org/content/dam/undp/library/Sustainable%20Development/Extractive_Industries-Activity_Report_2015.pdf> accessed 17 November 2016.
[264] United Nations Development Programme, "Extractive Industries for Sustainable Development: Global and Regional Activity Report 2015" <http://www.undp.org/content/dam/undp/library/Sustainable%20Development/Extractive_Industries-Activity_Report_2015.pdf> accessed 17 November 2016.
[265] United Nations Development Programme, "Mapping Mining to the Sustainable Development Goals: An Atlas (July 2016) <http://unsdsn.org/wp-content/uploads/2016/11/Mapping_Mining_SDGs_An_Atlas.pdf> accessed 17 November 2016.

> challenges… the aim of this Atlas is to encourage mining companies of all sizes to incorporate relevant SDGs into their business and operations, validate their current efforts and spark new ideas. Success will also require substantial and ongoing partnership between governments, the private sector, communities and civil society, and we hope the Atlas spurs action that will leverage the transformative power of collaboration and partnership between the mining industry and other stakeholders.[266]

The paper goes on to analyze each of the 17 SDGs and determine ways in which the mining industry can incorporate facets of each SDG into their mining activities. For example, the paper suggests that, with respect to SDG1 poverty eradication, mining companies can publicly disclose details of payments to governments and facilitate equitable access to equal employment.[267] The paper, with its helpful diagrams and easy-reference formatting, is perhaps the single most useful tool in existence for the mining industry to understand and incorporate the SDGs into their work. At a minimum, this paper represents collaboration between a UN body, the mining industry and other stakeholders, which is a rare and positive step forward. Time will tell if the collaboration continues to provide concrete sustainable development initiatives and efforts within the mining industry.

5. UN Industrial Development Organization

The United Nations Industrial Development Organization (UNIDO) is a specialized agency within the United Nations, established by the General Assembly in 1966 to promote industrialization in developing countries, providing technical assistance

[266] United Nations Development Programme, "Mapping Mining to the Sustainable Development Goals: An Atlas (July 2016) <http://unsdsn.org/wp-content/uploads/2016/11/Mapping_Mining_SDGs_An_Atlas.pdf> accessed 17 November 2016.
[267] United Nations Development Programme, "Mapping Mining to the Sustainable Development Goals: An Atlas (July 2016) <http://unsdsn.org/wp-content/uploads/2016/11/Mapping_Mining_SDGs_An_Atlas.pdf> accessed 17 November 2016.

and policy advice to developing countries to sustainably increase industrial activities.[268] UNIDO's work is similar to the UNEP and UNCTAD, including technical assistance, policy advising, establishment and compliance with industrial standards, and engaging with various stakeholders for sustainable industrial development.[269] Unfortunately, as with the UNEP, while UNIDO indicates it has done some in-country work relating to the mining industry, little activity is identifiable in this area other than providing biennial general statistics relating to the mining industry.[270] UNIDO did cooperate with UNDP, the World Economic Forum and others to produce the white paper "Mapping Mining to the Sustainable Development Goals: An Atlas," discussed above.

6. International Labor Organization

The International Labor Organization (ILO) is now a specialized agency of the United Nations, but began out of the 1919 Paris Peace Conference following World War I based on the concept that lasting peace requires social justice.[271] The ILO Constitution adopted in 1919 recognized in its preamble the interconnected nature of the world's labor, stating "the failure of any nation to adopt humane conditions of labour is an obstacle in the way of other nations which desire to improve the conditions in their own

[268] United Nations Industrial Development Organization (UNIDO) <http://www.unido.org/en/who-we-are/history.html> accessed 8 November 2014. UNIDO's mission was substantially overhauled in the 1990s to incorporate environmental considerations into the mission.
[269] United Nations Industrial Development Organization, "How We Work" <http://www.unido.org/en/how-we-work.html> accessed 27 January 2016.
[270] United Nations Industrial Development Organization, "World Statistics on Mining and Utilities" <http://www.unido.org/en/resources/publications/cross-cutting-services/world-statistics-on-mining-and-utilities.html> accessed 27 January 2016.
[271] International Labor Organization <http://www.ilo.org/global/about-the-ilo/history/lang--en/index.htm> accessed 15 November 2014. The ILO's 1944 Convention in Philadelphia adopted a declaration recognizing, among other truisms, that "poverty anywhere constitutes a danger to prosperity everywhere." Declaration of Philadelphia, Article I(c) <http://www.ilo.org/dyn/normlex/en/f?p=1000:62:0::NO:62:P62_LIST_ENTRIE_ID:2453907:NO#declaration> accessed 15 November 2014.

countries."[272] The ILO works towards social justice through statistical analysis, technical support and policy advising in broad areas affecting work, including decent work, social support, educational opportunities, protection of workers and children, gender equality and protecting collective action.[273] Early ILO efforts were made towards improving occupational safety and health for mine workers, including coal mine workers,[274] and the ILO has continued these efforts through the present day. ILO's Safety and Health in Mines Convention recognizes in the Preamble, "it is desirable to prevent any fatalities, injuries or ill health affecting workers or members of the public, or damage to the environment arising from mining operations."[275] The ILO mainly works through best practices and technical assistance in the mine worker safety area. Recently, the ILO has engaged in efforts to eliminate child labor in small-scale and artisanal mining operations.[276] However, the ILO does not address in any direct manner economic development or sustainable development, and only addresses environmental protection issues to the extent it directly affects workers. These limited activities are consistent with the ILO's current limited scope, but ignores the ILO's broad original purpose of working towards social justice.

[272] International Labor Organization Constitution, Preamble para. 3 <http://www.ilo.org/dyn/normlex/en/f?p=1000:62:0::NO:62:P62_LIST_ENTRIE_ID:2453907:NO> accessed 15 November 2014.
[273] International Labor Organization <http://www.ilo.org/global/topics/lang--en/index.htm> accessed 15 November 2014.
[274] International Labor Organization, Hours of Work (Coal Mines) Convention No. 31 (1931).
[275] International Labor Organization, Safety and Health in Mines Convention No. 176 (1995).
[276] International Labor Organization, "Minors out of mining Partnership" <http://www.ilo.org/ipec/areas/Miningandquarrying/WCMS_163749/lang--en/index.htm> accessed 27 January 2016.

Agenda 2030 and the Sustainable Development Goals

The most significant development, and the most convincing acknowledgment that sustainable development is one of the supreme international goals for the near future, is the unanimous international adoption of the global Sustainable Development Goals in 2015 as the established international agenda for the next 15 years. In early 2015, after months of groundwork, the United Nations General Assembly's Open Working Group for Sustainable Development Goals proposed 17 sustainable developments goals (SDGs) for inclusion in the post-2015 post-Millennium Development Goals agenda, to be considered by the United Nations General Assembly at its annual New York meeting in September 2015.[277] The 17 goals include ending poverty, ending hunger, ensuring healthy lives, equal education opportunities, gender equality, universally available and sustainable water and sanitation, reliable and sustainable energy, decent work and sustainable economic growth, sustainable industrialization, reducing inequality within and among countries, safe and sustainable cities, sustainable production and consumption patterns, urgent action to combat climate change, conservation of marine resources, sustainable use of land and protecting biodiversity, access to justice, and strengthening global institutional cooperation.[278] Like the Millennium Development Goals before them, each of the 17 Sustainable Development Goals has associated targets for achievement.[279] Remarkably, at the September 2015 General Assembly meeting, the

[277] United Nations General Assembly, "Report of the Open Working Group of the General Assembly on Sustainable Development Goals," A/68/970 (12 August 2014).
[278] United Nations General Assembly, "Report of the Open Working Group of the General Assembly on Sustainable Development Goals," A/68/970 (12 August 2014).
[279] United Nations, Sustainable Development Goals <https://sustainabledevelopment.un.org/?menu=1300> accessed 27 January 2016.

SDGs were unanimously adopted,[280] indicating universal approval for their implementation and support, a strong start to a decade and a half of future work.

The major criticism of the proposed goals is the breadth of the scope and unlikelihood of their achievement.[281] For example, a goal of ending extreme poverty everywhere by 2030 is of course laudable but highly unlikely to occur.[282] There is a significant difference between hopefulness and futility, and the SDGs taken as a whole faced potential futility. Indeed, one comment in The Lancet noted that Iceland and Libya do not have the same priorities and the one-size-fits-all nature of the SDGs ignores different situations, further suggesting SDGs should stand for "senseless, dreamy, garbled."[283] The Copenhagen Consensus Center, critical of the SDGs for their breadth and unlikely achievement, has taken constructive steps towards identifying the most promising SDGs and targets in the most promising countries, proposing to work on those goals and targets in those places where they can most likely be achieved.[284] Efforts towards identifying and facilitating achievement of goals and targets that are achievable where they are achievable should be expanded. Another significant criticism, related to the unlikelihood of achievement, is the slow pace at which the SDGs are being

[280] United Nations News Centre, "UN adopts new Global Goals, charting sustainable development for people and planet by 2030" (25 September 2015) <http://www.un.org/apps/news/story.asp?NewsID=51968> accessed 27 January 2016.
[281] International Institute for Environment and Development, "Convergence and Contention: The Least Developed Countries in post-2015 Debates" <http://www.iied.org> accessed 15 November 2014; International Institute for Environment and Development, commentary on the proposed SDGs <http://www.iied.org/owg-zero-draft-huge-step-forward-now-lets-get-practical> accessed 15 November 2014.
[282] Mike Woolridge, "Extreme poverty: Can it become a thing of the past?" BBC News (23 January 2016) <http://www.bbc.com/news/world-35370021> accessed 3 October 2016.
[283] Devi Sridhar, Comment, "Making the SDGs useful: a Herculean task," The Lancet 388:10053 (21 September 2016) < http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(16)31635-X/fulltext?rss%3Dyes> accessed 24 September 2016.
[284] Copenhagen Consensus Center < http://www.copenhagenconsensus.com/> accessed 18 August 2016.

implemented. The World Economic Forum was already writing in January 2016 about the need to speed up progress on the SDGs, and this remains an issue as there are only 13 more years to attempt to achieve very high goals.[285]

Another shortcoming is that none of the SDGs specifically relate to or mention sustainable development in the mining industry or any particular industry or sector. Likewise, none of the goals or targets relate to or mention the "green economy" or the role rare earth metals and copper will play in technology advances in the near future, although this would be too specific to include as a goal or target. Some of the goals indirectly relate to the mining industry, such as ending poverty, ensuring healthy lives, sustainable water management, sustainable industrialization and infrastructure development and land conservation.[286] For example, Target 1.4 aspires to ensure that all men and women "have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property" including access to natural resources and financing.[287] Target 3.9 seeks to "substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination" by 2030.[288] Target 15.1 seeks to "ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their

[285] Hans Lofgren, World Economic Forum, "How can we speed up progress on the SDGs?" (11 January 2016) <https://www.weforum.org/agenda/2016/01/how-can-we-speed-up-progress-on-the-sdgs/?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+world-economic-forum-blog+%28Forum%3ABlog%29> accessed 9 May 2016.
[286] United Nations, Sustainable Development Goals <https://sustainabledevelopment.un.org/?menu=1300> accessed 27 January 2016.
[287] United Nations, Sustainable Development Goals, Goal 1 <https://sustainabledevelopment.un.org/?menu=1300> accessed 27 January 2016.
[288] United Nations, Sustainable Development Goals, Goal 3 <https://sustainabledevelopment.un.org/?menu=1300> accessed 27 January 2016.

services, in particular forests, wetlands, mountains and drylands" by 2020.[289] Several other goals and targets can be applied to the mining industry, as shown in the UNDP white paper discussed above, but the SDGs and the process for their adoption neither addressed nor engaged the mining industry, making mining industry buy-in difficult. Had the process leading up to adoption of the SDGs involved industry, the likelihood that industry will be aware of and work to implement the SDGs would be higher.

UN Progress and Shortcomings on Sustainable Development Generally

1. Agenda 2030 and the Sustainable Development Goals

The United Nations has, at least on paper, made increasing efforts towards promoting and coordinating sustainable development activities, including creation of the Commission on Sustainable Development within the Economic and Social Council in 1993, the High-Level Political Forum for Sustainable Development in 2012, and culminating in unanimous adoption of Agenda 2030 and the Sustainable Development Goals. Although only recently adopted, nearly every United Nations entity has already incorporated the new SDGs into their websites and publications, indicating at least a coordinated effort towards promotion of the SDGs if not actual action. Effective implementation and progress towards the SDGs will take some years to achieve and confirm. The fact that Secretary-General Ban Ki-moon's term ended in 2016 may provide the new Secretary-General with a strong road map for the coming years, or may leave the SDGs somewhat rudderless, but only time will tell. After over two decades of

[289] United Nations, Sustainable Development Goals, Goal 15 <https://sustainabledevelopment.un.org/?menu=1300> accessed 27 January 2016.

Secretary-Generals attempting to shift at least some UN focus towards development, with mixed success at best, the new Secretary-General has a difficult job ahead.

As referenced above, the High-Level Political Forum on Sustainable Development is one of the many United Nations agencies, committees and offices recently tasked with implementing the Sustainable Development Goals. These recent global initiatives continue to focus heavily on sustainable development, including new discussions of sustainable development as a human right unto itself, although presently the pressure is towards recognizing a human right to a healthy environment not sustainable development. During the Post-2015 Global Thematic Consultation on Environmental Sustainability held between November 2012 and May 2013, one of the four principles that emerged for the post-2015 sustainability agenda was a human-rights based approach to environmental sustainability, linking human rights and a healthy environment that is sustainably developed.[290] The effectiveness of its work also will only be seen over time.

2. Global Environment Facility, Global Reporting Initiative, and Global Compact

In addition to these administrative developments, several particular programs have played important roles in the sustainable development movement. The Global Environment Facility, a partnership of 18 UN agencies and other public and private entities using strategic financing to address major global environmental problems, began in 1991 and has provided nearly $100 billion (USD) in grants and co-funding to various

[290] United Nations Environment Programme and United Nations Development Programme, Report of the Thematic Consultation on Environmental Sustainability in the Post-2015 Agenda, "Breaking Down the Silos: Integrating Environmental Sustainability in the Post-2015 Agenda," (16 October 2013) 4, 12 <http://www.undp.org/content/undp/en/home/librarypage/environment-energy/integrating-environmental-sustainability-post-2015/> accessed 8 November 2014.

national and local environmental projects, as well as facilitating funding for several environmental conventions including the United Nations Framework Convention on Climate Change, the Stockholm Convention on Persistent Organic Pollutants, and the Minamata Convention on Mercury.[291] The UNDP, UNEP and other UN entities also have successfully used financial incentives, such as project financing contingent upon mine safety regulations, to encourage adoption of sustainable development aspects. In this regard, financing and development assistance (aid) are proven tools for encouraging if not requiring state adoption of at least some aspects of sustainable development, such as environmental protections.

The Global Reporting Initiative, an independent international organization, has developed the best-known and most widely adopted set of company reporting standards for environmental and sustainability issues.[292] The Global Reporting Initiative developed the world's first set of sustainability reporting guidelines in 2000, and has continually refined and expanded the reporting guidelines by working with industry, government, academic, civil society and technical partners.[293] Perhaps most notably, the Global Reporting Initiative includes regional capacity building efforts and industry-specific guidance and reporting supplements, including supplements for the mining and metals and the oil and gas sectors of the mining industry.[294] A database of all Global Reporting Initiative-based company sustainability reports began in 2011 and includes

[291] Global Environment Facility <http://www.thegef.org/gef/whatisgef> accessed 8 November 2014.
[292] Global Reporting Initiative <https://www.globalreporting.org/Information/about-gri/Pages/default.aspx> accessed 10 July 2017.
[293] Global Reporting Initiative <https://www.globalreporting.org/information/about-gri/gri-history/Pages/GRI's%20history.aspx> accessed 10 July 2017.
[294] Global Reporting Initiative <https://www.globalreporting.org/information/about-gri/gri-history/Pages/GRI's%20history.aspx> accessed 10 July 2017.

over 24,000 reports to date.[295] In 2010, the Global Reporting Initiative and the United Nations' sponsored Global Compact, discussed below, agreed to cooperate towards integration of each entity's work into the other, such that the Global Compact principles are integrated into the sustainability reporting guidelines.[296] However, three major shortcomings of the Global Reporting Initiative are the voluntary nature of the reporting, the lack of verification of company-reported information, and the lack of enforcement as opposed to reliance upon voluntary company progress towards sustainability.

The United Nations' Global Compact is another useful tool,[297] a generally agreed upon set of ten principles for companies to adopt as essentially a corporate social responsibility policy.[298] The ten principles include protection of human rights, elimination of forced and child labor and employment discrimination, environmental responsibility and anti-corruption efforts.[299] However, the Global Compact is general and not industry specific, leaving major gaps in coverage and reducing its relevance. Additionally, the Global Compact is voluntary and carries no enforcement mechanisms (except expulsion from the Compact) or third party verification process, and these are major concerns. The only enforcement mechanism is voluntary reporting and peer pressure, although the Global Compact is encouraging the more robust reporting contained in the Global Reporting Initiative's current guidelines. Finally, the Global

[295] Global Reporting Initiative <https://www.globalreporting.org/information/about-gri/gri-history/Pages/GRI's%20history.aspx> accessed 10 July 2017.
[296] Global Reporting Initiative <https://www.globalreporting.org/information/about-gri/gri-history/Pages/GRI's%20history.aspx> accessed 10 July 2017.
[297] United Nations Global Compact <https://www.unglobalcompact.org/> accessed 27 January 2016.
[298] Heledd Jenkins and Natalia Yakovleva, "Corporate social responsibility in the mining industry: Exploring trends in social and environmental disclosure," Journal of Cleaner Production, 14:3-4 (2006) 271-284 <http://www.sciencedirect.com/science/article/pii/S0959652605000375> accessed 27 January 2016.
[299] United Nations Global Compact <https://www.unglobalcompact.org/> accessed 27 January 2016.

Compact is more limited than the broader sustainable development goals or sustainable development principles generally.

3. Role of Existing Treaties

Various environmental and social rights treaties negotiated and enforced under the auspices of the United Nations exist, such as CITES and CMS mentioned above.[300] However, these existing treaties, some decades old, did not necessarily consider let alone incorporate the global sustainable development mandate.

One bright spot is that the ICJ may be prepared to recognize some aspects of sustainable development as an ongoing responsibility inherent in at least some existing treaties, possibly through customary international law. In the *Gabcikova-Nagymaros Danube Dam* case, the ICJ recognized in 1997 that environmental knowledge and standards are continuing and developing in nature, that "vigilance and prevention are required on account of the often irreversible character of damage to the environment and of the limitations inherent in the very mechanism of reparation of this type of damage."[301] The ICJ also stated the "need to reconcile economic development with protection of the environment is aptly expressed in the concept of sustainable development," although this left social development out of the sustainable development formulation.[302] Judge Weeramantry, writing separately, stated "[w]hile, therefore, all peoples have the right to initiate development projects and enjoy their benefits, there is

[300] A comprehensive analysis of sustainable development as seen through various environmental and social rights treaties is beyond the scope of this thesis.
[301] Hungary v. Slovakia (Gabcikova-Nagymaros Danube Dam Case), 1997 International Court of Justice Reporter 7.
[302] Hungary v. Slovakia (Gabcikova-Nagymaros Danube Dam Case), 1997 International Court of Justice Reporter 7.

likewise a duty to ensure that those projects do not significantly damage the environment" which also underpins numerous human rights, and the "concept of sustainable development is thus a principle accepted not merely by the developing countries but one which rests on a basis of worldwide acceptance."[303] The ICJ also wrote on the merits in the *Pulp Mills* case in April 2010 that "the attainment of optimal and rational utilization [of the River Uruguay] requires a balance between the Parties' rights and needs to use the river for economic and commercial activities and the obligation to protect it from any damage to the environment that may be caused by such activities" and it is this "balance between economic development and environmental protection that is the essence of sustainable development," and requiring an environmental impact assessment as a matter of customary international law.[304]

Additionally, the various environmental and social rights treaties mainly rely on periodic reporting requirements with periodic expert review, essentially using peer pressure for enforcement of treaty terms unless the Security Council chooses to take enforcement action, which rarely if ever occurs.[305] The Committee on Elimination of Discrimination Against Women (CEDAW), the Committee on the Rights of the Child (CRC) and the Committee on Migrant Workers (CMW) all use periodic reporting and review processes to monitor compliance and progress towards ensuring treaty obligations

[303] Hungary v. Slovakia (Gabcikova-Nagymaros Danube Dam Case), 1997 International Court of Justice Reporter 7.
[304] Argentina v. Uruguay (Pulp Mills on the River Uruguay Case), 2010 International Court of Justice Reporter 14.
[305] For example, the Security Council in October 2015 adopted Resolution 2242 relating to gender equality, and especially relating to treatment of women and girls in armed conflict, but it merely reaffirmed the need to adopt CEDAW and reiterated the urgings from numerous prior Security Council resolutions, dating back to Resolution 1325 in 2000 on the same topics. United Nations Security Council Resolution 2242, S/Res/2242 (13 October 2015).

are carried out domestically including incorporation into national law, to varying degrees of success since some treaty member states lack capacity to prepare periodic compliance reports let alone progressively implement treaty obligations through national law.[306] Bilateral and multilateral treaties also exist relating to discrete projects and issues, such as the Hungary-Czechoslovakia treaty for operation of the Gabcikova-Nagymaros Danube Dam project, which post-Communist Hungary unsuccessfully attempted to withdraw from.[307] Additionally, these treaties are in essence for environmental protection only, and do not address the broader issues of social development and trade encompassed in sustainable development generally, or the mining industry particularly.

The one possible exception is the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo or EIA), [308] which establishes state obligations to conduct environmental impact assessments at early project stages and notify bordering states if the project will have a significant trans-boundary environmental effect. This Convention, although adopted mainly by European and other developed countries thus far, helps promote both environmental and social sustainability, including for future generations. The Espoo Convention is applicable to the mining industry because mining projects may now be required to have environmental impact assessments, including possible reporting to neighboring states of environmental impacts

[306] Alan Boyle and Christine Chinkin, *The Making of International Law* (Oxford University Press 2007) 154-155.
[307] Hungary v. Slovakia (Gabcikova-Nagymaros Danube Dam Case), 1997 International Court of Justice Reporter 7.
[308] Convention on Environmental Impact Assessment in a Transboundary Context <http://www.unece.org/env/eia/eia.html> accessed 27 January 2016. Sometimes called Espoo because of the town in Finland where it was adopted in 1991. The other possible exception of a treaty applicable to the mining industry is the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, although it is only tangentially related.

prior to project start-up. In practice, major mining companies already conduct environmental impact assessments (small and artisanal mining ventures may not), the national government should require environmental impact assessments as part of any national mining or environmental law, and the sticking point again is national capacity and competence to enforce the EIA requirements and address any identified environmental threats.

4. Modest Gains

While modest efforts and gains have been accomplished, the modesty of these gains is striking given the massive and global reach of the United Nations. In other words, an organization as big as the United Nations should be able to do much more. Establishment of bureaucratic entities and providing them with sustainable development goals is insufficient. Nor are the relatively small programs and financial incentives provided by various United Nations entities sufficient to garner wholesale adoption of sustainable development goals.

First, the United Nations remains too bureaucratic, inefficient and non-responsive to effectively take a leadership role on sustainable development. Remarkably, back in 1972, Principle 25 of the Stockholm Declaration sought to "ensure that international organizations play a coordinated, efficient and dynamic role for the protection and improvement of the environment."[309] Unfortunately, while the *number* of international organizations addressing environmental concerns increased after Stockholm, they were neither coordinated nor efficient. As Philippe Sands and Jacqueline Peel write:

[309] Report of the United Nations Conference on the Human Environment A/CONF.48/14/REV.1 (16 June 1972) p. 5, Principle 25.

> The [post-Stockholm] proliferation did not occur in the context of a coherent strategy, and there was little effort to ensure effective co-operation or co-ordination between them. Moreover, significant gaps existed, and many activities considered to be particularly harmful to the environment remained outside the scope of formal international institutional authority. Activities relating to energy, mining and transport (other than air transport) sectors are examples for which no single UN body yet has overall responsibility.[310]

The Declaration of The Hague in 1989 and subsequent conferences and commentators recognized this problem and called for a new UN body with overall responsibility for sustainable development and preserving the environment.[311] This has not come to pass.[312]

Second, the various agencies and entities touching on sustainable development lack clear jurisdiction, boundaries and purposes. Indeed, several of the international organizations and agencies working towards sustainable development overlap in scope and activities, such as the HLPF-SD and the new UNOSD. To be clear, some overlap is intentional and coordinated, such as the World Bank, UNEP and UNDP partnering in the Global Environment Facility and other global funds to support local and national environmental projects that benefit the global commons.[313] The Global Environment Facility began in 1991 and has provided nearly $100 billion (USD) in grants and co-funding to various national and local environmental projects, as well as facilitating

[310] Philippe Sands and Jacqueline Peel, *Principles of International Environmental Law* (Cambridge University Press 2012) 53.
[311] Jan Gustav Strandaneas, Stakeholder Forum, "A Council for Sustainable Development" (2012) <http://www.uncsd2012.org/content/documents/JGS-SDC-final.pdf> accessed 27 January 2016.
[312] Judge Glazebrook notes, regarding international human rights and environmental organizations, "the current multiplicity of international bodies can be seen as an inefficient use of resources and better synergies may be garnered by consolidating relevant expertise in one specialised body," a suggestion also made in Chapter 38 of Agenda 21. Hon. Susan Glazebrook, "Human Rights and the Environment," 40 Victoria University of Wellington Law Review (2009) 293.
[313] Global Environment Facility (GEF) <http://www.thegef.org/gef/whatisgef> accessed 8 November 2014.

funding for several environmental conventions including the United Nations Framework Convention on Climate Change, the Stockholm Convention on Persistent Organic Pollutants, and the Minamata Convention on Mercury. However, not all UN organizations coordinate their activities, and the overlap at the international level alone is significant, to say nothing of the overlap with regional, sub-regional and national agencies and organizations also carrying out some aspects sustainable development activities. This overlap leads to confusion over which agencies have primary responsibility for what areas, creates impediments for finding assistance and answers, and increases costs for the agencies as well as the countries and people trying to work with the agencies.

The United Nations recently began making some efforts towards system-wide reform and reorganization, beginning with the Secretary-General's Delivering as One initiative.[314] Delivering as One included change at the United Nations and member state levels, with several countries serving as pilot projects but global implementation has not occurred. Secretary-General Ban Ki-moon also appointed a Change Management Team in 2011, which produced a report but little action appears to have followed. As one example, the new United Nations Inter-Agency Cluster on Trade and Productive Capacity is led by the UNCTAD and includes UNIDO, UNDP, ITC, FAO, WTO, UNEP, ILO, UNCITRAL, UNOPS and the five UN Regional Commissions, although other than clustering together it is not apparent how the cluster has improved operations or access, or completed any actual work it has undertaken.[315] Furthermore, creating clusters for

[314] United Nations, "Delivering as One: Secretary-General's High-Level Panel on UN System-Wide Coherence" (9 November 2006).

[315] The cluster has a website <http://unctad.org/en/Pages/About%20UNCTAD/CEB-Inter-Agency-Cluster-on-Trade-and-Productive-Capacity.aspx> accessed 15 November 2014. There is no content on the

international organizations to work together does not necessarily address the issues of confusing jurisdictions, impediments to accessing assistance and increased costs to agencies and users. The Delivering as One initiative also sought to consolidate three United Nations entities relating to gender equity consolidated into one, and have one United Nations country coordinator for each country rather than United Nations representatives for various programs and resources working in or responsible for each country.[316] Consolidation of gender equity entities is a very small step towards greater coherence within the United Nations system, and much more is needed, although resistance to both change and the downsizing of bureaucracies likely will be formidable.

Third, a further major issue for United Nations institutions is the lack of effective enforcement tools. Unlike the WTO, which includes the Dispute Settlement System binding on WTO Members, no United Nations bodies have a mandatory enforcement system. Some treaties can be enforced through the International Court of Justice or other means, depending on treaty language, but membership in the United Nations or other international institutions carries no enforcement. Indeed, even though the Sustainable Development Goals were unanimously adopted, there is no mechanism by which to ensure any of the member states carries through with efforts towards accomplishing the SDGs and their associated targets. Instead, the UN institutions rely on reporting, cooperation and peer pressure, with mixed results.

website other than a simple statement that it is dedicated to the coordination of trade and development operations at the national and regional levels within the UN system.

[316] United Nations, "Delivering as One: Secretary-General's High-Level Panel on UN System-Wide Coherence" (9 November 2006). Forty-three countries have now voluntarily requested the "delivering as one" approach for their countries.

Fourth, global security, war and terrorism threats continue to dominate the headlines as well as the focus for much of the United Nations' work, not inappropriately it must be said. The Arab Spring and resulting civil wars, ongoing conflicts in northern Africa and the Middle East, the Middle East refugee crisis, Russia's illegal annexation in Crimea, and continued provocation around China and North Korea are but some of the security concerns arising in the past few years alone. While work towards sustainable development is a goal, it is a longer-term goal that continues to take a back seat to present peace and security threats. The United Nations may not have the internal capacity to effectively address current security threats and long-term sustainable development goals. Leadership change in 2017 also leaves the United Nations somewhat in a state of uncertainty, at least until the new Secretary-General is identified. The incoming Secretary-General will need some time to grow into the position after taking over in 2017 as well. This combination of leadership change and ongoing present security threats leaves the Sustainable Development Goals vulnerable.

UN Shortcomings on Sustainable Development in Mining Industry

Compounding the above-referenced general problems of lack of coordination and lack of enforcement mechanisms is the general lack of attention to the mining sector at the United Nations level.

As noted, Sands and Peel discuss the fact that mining receives paltry attention at the international organization level.[317] One factor perhaps making the United Nations reluctant to assert themselves in the realm of mining is the long-standing principle of

[317] Philippe Sands and Jacqueline Peel, *Principles of International Environmental Law* (Cambridge University Press 2012) 53.

state sovereignty over domestic natural resources, discussed in chapter one.[318] The resolution titled "Permanent Sovereignty over Natural Resources," was part of the United Nations efforts towards promoting the right of self-determination, especially for developing states and their economies. The 1962 resolution states: "[t]he right of peoples and nations to permanent sovereignty over their natural wealth and resources must be exercised in the interest of their national development and of the well-being of the people of the State concerned [and] [t]he exploration, development and disposition of such resources… should be in conformity with the rules and conditions which the peoples and nations freely consider to be necessary or desirable with regard to the authorization, restriction or prohibition of such activities."[319] However, more recently many developing countries have embraced international technical and financial assistance towards the domestic mining industry, such that state sovereignty is seemingly less a concern at least as it relates to the types of assistance the United Nations could provide.

The UN's lack of attention to mining and sustainable development is also perhaps because of the belief that mining negatively impacts growth for developing countries, the so-called "natural resource curse." In 2001, Jeffrey D. Sachs and Andrew M. Warner published an article in the European Economic Review, "Natural resources and economic development: the curse of natural resources,"[320] that caused a stir in academic and industry circles. Sachs and Warner found an association between natural resource abundance and lower than expected national growth rates, providing examples including

[318] United Nations General Assembly Resolution 1803/62 (14 December 1962).
[319] United Nations General Assembly Resolution 1803/62 (14 December 1962).
[320] Jeffrey D. Sachs and Andrew M. Warner, "Natural resources and economic development: the curse of natural resources," European Economic Review 45 (2001) 827-838.

Congo and Angola.[321] The ensuing discussion and now academic lore is that developing countries with abundant natural resources will be worse off than those with fewer natural resources to rely upon for development.[322] However, a careful reading of the original article shows the examples Sachs and Warner used were contrasted by positive growth in Chile, Brazil, Colombia and elsewhere.[323] The difference between negative and positive outcomes appears to lie principally in the existence of appropriate domestic legislation and enforcement efforts, including transparency of foreign direct investment at the domestic level, corruption prevention, and environmental protection standards and enforcement.[324] Notably, these same input factors are part of standard sustainable development programs. In other words, if sustainable development efforts are put forth in developing countries with available natural resources, the sustainable development efforts will actually help ensure stronger national growth and development. Based in part on the "natural resource curse" perception, mining is often excluded from the discussion of sustainable development efforts. This is despite the fact the World Bank has carried out work analyzing and proposing policies for countries with mineral and raw material resources, finding developing countries with mining growing one percent per annum faster than non-mining countries from 2001 to 2011, with comparable gains towards the Millennium Development Goals and no overall impact on good

[321] Jeffrey D. Sachs and Andrew M. Warner, "Natural resources and economic development: the curse of natural resources," European Economic Review 45 (2001) 827-838.
[322] Andrew Warner, International Monetary Fund staff, IMF Working Paper, "Natural Resource Booms in the Modern Era: Is the curse still alive?" WP/15/237 (2015).
[323] Theodore H. Moran, World Trade Organization, "Is FDI in Natural Resources a "Curse"? (2010) <https://www.wto.org/english/res_e/publications_e/wtr10_forum_e/wtr10_moran_e.htm> accessed 22 August 2015.
[324] Theodore H. Moran, World Trade Organization, "Is FDI in Natural Resources a "Curse"? (2010) <https://www.wto.org/english/res_e/publications_e/wtr10_forum_e/wtr10_moran_e.htm> accessed 22 August 2015.

governance.[325] Regardless, the resource curse myth may have pervaded United Nations institutions and turned the UN off to the mining industry generally.

Setting aside the "natural resource curse" issue, the United Nations has nevertheless occasionally addressed the mining industry, only to again forget about it. For example, the 2002 World Summit on Sustainable Development at Johannesburg adopted a Plan of Implementation, coordinated through the ECOSOC Committee on Sustainable Development.[326] This Plan of Implementation is one of the first documents adopted by a UN institution to recognize the role of mining in economic and social development as well as to "modern living."[327] The Plan of Implementation recognized that sustainable development of mined minerals and raw materials requires: (a) addressing the benefits and costs including worker safety, (b) enhancing participation of indigenous communities and women in the mining life cycle, including after mine closure and for transboundary impacts, and (c) fostering sustainable mining practices and improving value-added processing techniques and mine rehabilitation.[328] Chapter XI of Plan of Implementation also recognized the fractured institutional framework relating to sustainable development at the international, regional and national levels, including the UN General Assembly, the UN Economic and Social Council (ECOSOC), the UNEP,

[325] Gary McMahon, Joseph Raymond, Susana Moreira, World Bank Group, "The contribution of the mining sector to socioeconomic and human development," Extractive industries for development series no. 30 (2014) <http://documents.worldbank.org/curated/en/2014/04/19435144/contribution-mining-sector-socioeconomic-human-development> accessed 8 November 2014.
[326] Report of the World Summit on Sustainable Development, Plan of Implementation of the World Summit on Sustainable Development, A/CONF.199/20 (4 September 2002) 7-77.
[327] Report of the World Summit on Sustainable Development, Plan of Implementation of the World Summit on Sustainable Development, A/CONF.199/20 (4 September 2002) Para. 46.
[328] Report of the World Summit on Sustainable Development, Plan of Implementation of the World Summit on Sustainable Development, A/CONF.199/20 (4 September 2002) Para. 46. The Plan of Implementation includes a special section for Sustainable Development in Africa, which also includes passing reference to mining minerals and raw materials (Para. 62).

the United Nations Commission for Sustainable Development and many other agencies and organizations.[329] The Plan of Implementation further recognized that integration was an essential element for global sustainable development governance, and the need to better integrate and strengthen the social, economic and environmental dimensions of sustainable development into actual policies and programs at all levels of governance. The recommendations included inter-institutional forums to resolve some of these problems. However, there was no discernible follow up to these portions of the Plan of Implementation by the United Nations.

Another aspect of sustainable development applicable to the mining industry is local community input and consent to mining projects, especially if relocation is required. The United Nations' Declaration on the Rights of Indigenous Peoples, in conjunction with the International Labor Organization's Convention 169, has spurred development of the principle of "free, prior and informed consent" (FPIC) to ensure consent is granted from affected communities before proposed undertakings such as mining operations occur in a locality.[330] But, FPIC is primarily recognized as a duty of the state, not industry, and is typically focused on the rights of indigenous peoples not local communities as a whole.[331] For these reasons, FPIC is presently not a major point of engagement between the UN and the mining industry.

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[329] Report of the World Summit on Sustainable Development, Plan of Implementation of the World Summit on Sustainable Development, A/CONF.199/20 (4 September 2002) 7-77.

[330] Jason Pmo and D. Scott Slocombe, "Exploring the origins of 'social license to operate' in the mining sector: Perspectives from governance and sustainability theories," Resources Policy 37:3 (September 2012) 346-357 <http://www.sciencedirect.com/science/article/pii/S0301420712000311> accessed 27 January 2016.

[331] Jason Pmo and D. Scott Slocombe, "Exploring the origins of 'social license to operate' in the mining sector: Perspectives from governance and sustainability theories," Resources Policy 37:3 (September 2012) 346-357 <http://www.sciencedirect.com/science/article/pii/S0301420712000311> accessed 27 January 2016.

The UN's lack of attention to the mining industry is counter-intuitive. As recognized in the 1987 Brundtland Report, population and development surges have placed pressure on the need for *sustainable* development of mined metals and minerals. The Brundtland Report specifically found that "[s]ustainable development requires that the rate of depletion of non-renewable resources should foreclose as few future options as possible."[332] The Brundtland Report went on to recommend:

> [a]s for non-renewable resources, like fossil fuels and minerals, their use reduces the stock available for future generations. But this does not mean that such resources should not be used. In general the rate of depletion should take into account the criticality of that resource, the availability of technologies tor minimizing depletion, and the likelihood of substitutes being available [and]… [w]ith minerals and fossil fuels, the rate of depletion and the emphasis on recycling and economy of use should be calibrated to ensure that the resource does not run out before acceptable substitutes are available.[333]

The Brundtland Report also recommended "modifying the pattern of world trade in minerals to allow exporters a higher share in the value added from mineral use, and improving the access of developing countries to mineral supplies, as their demands increase."[334] The Brundtland Report also commented as follows about the trade in minerals and other raw materials:

> The dependence of the developed market economies on other mineral imports from the developing countries has also grown, and the share of these imports in consumption increased from 19 per cent in 1959-60 to 30 per cent in 1980-81... Developing countries face the dilemma of having to use commodities as exports, in order to break foreign exchange constraints on growth, while also having to minimize damage to the environmental resource base supporting this growth.[335]

[332] Brundtland Report, A/43/427 (4 August 1987) 55-56, 68.
[333] Brundtland Report, A/43/427 (4 August 1987) 55-56, 68.
[334] Brundtland Report, A/43/427 (4 August 1987) 55-56, 68.
[335] Brundtland Report, A/43/427 (4 August 1987) 87.

The situation for developing countries has not changed dramatically since the Brundtland Report, as developing countries still mine natural resources for export in exchange for foreign direct investment or foreign funds to then invest (hopefully) in the local and national economies. Despite these well-established facts, and despite the clear mandate held by the United Nations to promote sustainable development globally, the United Nations has done little to encourage sustainable development in the mining industry for several decades.

Having discussed the progress and shortcomings by the United Nations with respect to sustainable development in the mining industry, including the general lack of engagement of the mining industry, it is natural to look towards the primary international trade organization, the World Trade Organization, to assess its role in promoting sustainable development generally and in the mining industry in particular.

Chapter Four

World Trade Organization: Structural Limitations

Introduction

In the absence of leadership and concrete action by the United Nations for sustainable development in mining, despite being the primary public international institution promoting societal development and environmental protection, one naturally turns to the economic side of sustainable development for potential leadership. For this reason, this chapter focuses on the World Trade Organization, which is the only public international institution to date to focus significant attention on rare earths, albeit through its dispute settlement system. Specifically, the WTO addressed a trade dispute between China, the United States, Japan and the EU over China's trade restrictions on rare earth metals, referred to as the *Rare Earths* case. The *Rare Earths* case, along with its immediate predecessor the *Raw Materials* case, provide insights into the opportunities and limitations of the WTO in the realm of sustainable development. First, given that the WTO structure is not general knowledge, this chapter considers the WTO's operational structure that impacts on sustainable development. Next, several WTO cases impacting on sustainable development, including the *Rare Earths* case, are examined in depth. The WTO's separate role in cooperating with other public international institutions and providing technical assistance to members also is analyzed. Finally, analysis is provided on the ability and efficacy of the WTO's provisions and efforts relating to sustainable development in mining.

The World Trade Organization: A Brief Overview

The current system of international trade law arose from the ashes of World War II, as part of a series of proposals directed towards repair of the world economy.[336] World War I and the Great Depression of the 1930s spurred many countries to adopt extreme protectionist trade policies ostensibly protecting domestic industry, raising import duties significantly in "beggar-thy-neighbor" policies, prompting other countries to retaliate thus reducing trade to the detriment of the domestic and world economy.[337] The Bretton Woods Agreement of 1944 led to creation of the International Monetary Fund (IMF) to regulate monetary exchange rates, and the International Bank for Reconstruction and Development ("World Bank") to provide loans and financial assistance for development, both discussed in greater detail in the next chapter.[338] Negotiations on both a trade organization, the International Trade Organization (ITO), and a trade agreement, the General Agreement on Tariffs and Trade (GATT), proceeded simultaneously,[339] but negotiations stalled on the ITO and eventually were abandoned.[340] The United States Congress's objections effectively quashed the ITO, highlighting the continuing tension between state sovereignty and engagement with international institutions that remains today.

[336] Michael J. Trebilcock, *Understanding Trade Law* (Edward Elgar Publishing Ltd. 2011) 10.
[337] Michael J. Trebilcock, *Understanding Trade Law* (Edward Elgar Publishing Ltd. 2011) 10.
[338] Michael J. Trebilcock, *Understanding Trade Law* (Edward Elgar Publishing Ltd. 2011) 10; Peter Van den Bossche and Werner Zdouc, *The Law and Policy of the World Trade Organization* (Cambridge University Press 3rd Ed. 2013) 76.
[339] Peter Van den Bossche and Werner Zdouc, *The Law and Policy of the World Trade Organization* (Cambridge University Press 3rd Ed. 2013) 76-77.
[340] Peter Van den Bossche and Werner Zdouc, *The Law and Policy of the World Trade Organization* (Cambridge University Press 3rd Ed. 2013) 76-78. The agreement, called the Protocol of Provisional Application of the General Agreement on Tariffs and Trade, was entered on 30 October 1947. Ultimately, the ITO never came to fruition, due in part to objections from the United States Congress.

In late 1947, the GATT negotiating countries signed a provisional protocol for application of the GATT terms that remained in place until 1995. The GATT terms included fundamental agreements on tariff rate reductions,[341] prohibitions on quantitative restrictions such as quotas or import/export restrictions,[342] adopting principles of non-discrimination in trade among the Members and agreeing to regular trade negotiations.[343] In the void of any international trade organization, GATT transformed over the ensuing five decades to become an international trade organization of sorts, with multiple rounds of trade negotiations successfully reducing tariffs on a range of goods from a 40 percent average to just four percent. Weaknesses in this makeshift trade system emerged over time, and the GATT parties agreed to open a new round of negotiations while meeting in Uruguay in September 1986, the "Uruguay Round."[344] After years of negotiations, the Agreement Establishing the World Trade Organization ("WTO Agreement" or

[341] Tariff rate reductions are intended to address the problems of imports being priced out of the market to the detriment of the exporter and exporting country, then domestic producers pricing up to the tariff or lacking price competition to the greater detriment of domestic consumers. Michael J. Trebilcock, *Understanding Trade Law* (Edward Elgar Publishing Ltd. 2011) 32.

[342] Michael J. Trebilcock, *Understanding Trade Law* (Edward Elgar Publishing Ltd. 2011) 32-33. Reducing quantitative restrictions is intended to address the problems of scarcity rents for recipients at the expense of higher prices for consumers. Subsidies of domestic production are another form of quantitative restriction that makes domestic products artificially competitive, distorting resource allocation and market-based production decisions.

[343] GATT 1947, Art. I, Art. II, Art. III, Art. XI, Art. XXVII; Michael J. Trebilcock, *Understanding Trade Law* (Edward Elgar Publishing Ltd. 2011) 12, 16-17; Peter Van den Bossche and Werner Zdouc, *The Law and Policy of the World Trade Organization* (Cambridge University Press 3rd Ed. 2013) 76-78.

[344] Peter Van den Bossche and Werner Zdouc, *The Law and Policy of the World Trade Organization* (Cambridge University Press 3rd Ed. 2013) 78-81. In February 1990, in the wake of significant global democratization and significant global economic change, Italian Trade Minister Renato Ruggiero suggested creating a new international trade organization. Just two months later, in April 1990, Canada formally proposed creating a World Trade Organization, and three months later the European Communities proposed a multilateral trade organization. Negotiations continued, culminating in a draft final agreement that most GATT parties were prepared to sign, including a newly-elected U.S. President Bill Clinton who was concerned about the United States being left out of a new major trading system.

"Marrakesh Agreement") was signed in Marrakesh on 15 April 1994, and came into effect 1 January 1995.[345]

The WTO Agreement provides Members with a set of principles and a framework for conducting the trade relations arising from the multilateral and plurilateral trade agreements annexed to the WTO Agreement.[346] The WTO itself is intended to provide a forum for conducting trade relations among Members based on various trade and other agreements annexed to the WTO framework agreement. The WTO's core work breaks down into four primary areas: (1) hosting trade negotiations;[347] (2) facilitating administration of multilateral and plurilateral trade agreements and administering the Trade Policy Review Mechanism (TPRM) for periodic review of Member trade policies;[348] (3) administering the WTO dispute resolution mechanism; and (4) cooperation with the International Monetary Fund, World Bank Group and other public international institutions as well as facilitating technical assistance to developing country members.[349] Only two areas of core WTO work, dispute resolution and

[345] Peter Van den Bossche and Werner Zdouc, *The Law and Policy of the World Trade Organization* (Cambridge University Press 3rd Ed. 2013) 81.

[346] Article II:1 of the WTO Agreement. Multilateral agreements annexed to the WTO Agreement are binding on all Members, whereas plurilateral agreements annexed to the WTO Agreement are binding only on those Members entering into the agreements.

[347] Trade negotiations among members is driven by the members themselves and while the WTO can facilitate negotiations on various topics and assists with administration of existing agreements, the WTO cannot itself determine areas of agreement or disagreement. For this reason, this thesis does not discuss the WTO's trade negotiations hosting and trade administration roles in depth.

[348] Likewise this thesis does not discuss the Trade Policy Review Mechanism in detail, as the process involves member reporting on domestic trade policies and WTO review of member trade policies, done on a regular basis with publication of a report for transparency purposes.

[349] WTO Agreement, Article II:1, Article III and Annex 3 (1995). The WTO recently was tasked with providing developing countries with training and technical assistance to allow integration into the global trading system. Ministerial Conference, Doha Ministerial Declaration, WT/MIN(01)/DEC/1 (20 November 2001), para. 38. Van den Bossche and Zdouc specifically call this technical assistance out as an important if unenumerated task carried out by the WTO. Peter Van den Bossche and Werner Zdouc, *The Law and Policy of the World Trade Organization* (Cambridge University Press 3rd Ed. 2013) 84-85, 101-104.

cooperation with other public international institutions including technical assistance, may allow the WTO itself to address the mining industry or sustainable development. These two areas are discussed in depth below.

WTO Agreement Provisions at Issue for Mining and Sustainable Development

1. Preamble

The WTO Agreement begins, importantly, with a Preamble, stating in relevant part:

> *Recognizing* that their relations in the field of trade and economic endeavour should be conducted with a view to raising standards of living, ensuring full employment and a large and steadily growing volume of real income and effective demand, and expanding the production of and trade in goods and services, while allowing for the optimal use of the world's resources in accordance with the objective of sustainable development, seeking both to protect and preserve the environment and to enhance the means for doing so in a manner consistent with their respective needs and concerns at different levels of economic development,
>
> *Recognizing* further that there is need for positive efforts designed to ensure that developing countries, and especially the least developed among them, secure a share in the growth in international trade commensurate with the needs of their economic development,
>
> *Being desirous* of contributing to these objectives by entering into reciprocal and mutually advantageous arrangements directed to the substantial reduction of tariffs and other barriers to trade and to the elimination of discriminatory treatment in international trade relations.[350] (underlining added)

The Preamble is described as stating the "ultimate objectives of the WTO," which are to: (1) increase the standards of living; (2) attain full employment; (3) growth of real income and effective demand; and (4) expansion of production of and trade in goods and services, while taking into account the needs for environmental preservation, sustainable

[350] Agreement Establishing the World Trade Organization [1994], Preamble.

economic development, and the integration of developing countries.[351] In essence, this latter language is the embodiment of the current conception of sustainable development, taking into account economic development, social development and environmental protection.

Unlike preamble statements in other international documents in which the preamble is non-binding, this Preamble has been given tremendous value by the WTO Appellate Body. The Appellate Body in the WTO's US – Shrimp case (1998) stated: "the preambular language reflects the intentions of negotiators of the WTO Agreement… [and] must add colour, texture and shading to our interpretation of the agreements annexed to the WTO Agreement."[352] The Appellate Body's approach of giving life to the preamble has been consistent since the WTO's inception.[353]

2. WTO Dispute Resolution System

The "Dispute Settlement Understanding," or DSU, creates a three-stage dispute settlement process.[354] This dispute settlement system is a highly effective at resolving trade disputes and represents a uniquely effective enforcement system at the public international institutional level. The first stage of the process requires an aggrieved Member to request consultation with the Member and attempt to resolve the dispute

[351] Peter Van den Bossche and Werner Zdouc, *The Law and Policy of the World Trade Organization* (Cambridge University Press 3rd Ed. 2013) 83.
[352] Appellate Body Report, US – Shrimp, WT/DS58/AB/R (12 October 1998), para. 153. The Appellate Body went on to read Article XX(g), discussed below, with the perspective contained in the preamble.
[353] Appellate Body Report, US – Standards for Reformulated and Conventional Gasoline, WT/DS2/AB/R (29 April 1996) 30 ("in the preamble to the WTO Agreement… there is specific acknowledgement to be found about the importance of coordinating policies on trade and the environment").
[354] Michael J. Trebilcock, *Understanding Trade Law* (Edward Elgar Publishing Ltd. 2011) 26-28. For critique, see Joel P. Trachtman, "The Domain of WTO Dispute Resolution," 40 Harvard International Law Journal 333 (Spring 1999).

through mutual negotiation.[355] Over half of all WTO disputes are either resolved or dropped at this first stage.[356] At the second stage, the aggrieved Member may request the Dispute Settlement Body (DSB) establish a panel to resolve the dispute.[357] The panel makes a report, including objective factual findings and recommendations regarding Member compliance with the agreement at issue, to the General Council sitting as the DSB.[358] About a third of the remaining trade disputes are resolved at the panel level.[359] The third stage is appeal to a panel of three Appellate Body members, which issues a report on the dispute.[360] The Appellate Body may concur with, modify or reverse the

[355] WTO Agreement, Annex 2 ("DSU") (1995); Michael J. Trebilcock, Understanding Trade Law (Edward Elgar Publishing Ltd. 2011) 13-14. The aggrieved Member begins the dispute resolution process by sending an official request for consultation to the other Member. Consultations at this level are confidential.

[356] World Trade Organization, The Future of the WTO: Addressing institutional challenges in the new Millennium ("Sutherland Report") (2004) 50.

[357] WTO Agreement, Annex 2 (DSU), Article 6, 8 (1995); Michael J. Trebilcock, Understanding Trade Law (Edward Elgar Publishing Ltd. 2011) 13-14. Panels are composed of three qualified representatives from Members (taken from an existing list), but the panel does not include representatives from Members that are parties to the dispute.

[358] WTO Agreement, Annex 2 (DSU), Articles 2, 9, 10, 11, 13, 14, 15, 16, 18 and footnote 1 (1995); Michael J. Trebilcock, Understanding Trade Law (Edward Elgar Publishing Ltd. 2011) 13-14. In its process, the panel takes written submissions from the Members involved in the dispute and conducts hearings, and is to complete its work and report to the General Council sitting as the DSB within, as a general rule, six to nine months. Panel reports to the General Council are public, although panel deliberations are confidential and individual panelist opinions are ostensibly anonymous. Once a panel report is sent to the DSB, it is placed on the agenda for the DSB unless a Member party to the dispute appeals to the Appellate Body. The panel report is adopted by the General Council, sitting as the DSB, unless rejected by negative consensus, meaning the DSB is deemed to accept the panel report if no Member present at the meeting formally objects to the proposed decision.

[359] WTO Table, "Percentage of Panel Reports Appealed by Year of Adoption: 1995 to 2012" <http://www.wto.org/english/tratop_e/dispu_e/stats_e.htm> accessed 6 September 2014. Although panel reports were appealed in all cases in 1996 and 1997, just after the DSU took effect, since 1997 the number of appeals has dropped, and hovers around two-thirds now. This figure is expected to decrease as panel and appeal outcomes become more predictable with a more robust decision history.

[360] WTO Agreement, Annex 2 (DSU), Articles 16, 17. The Appellate Body only considers issues of law and legal interpretations, not issues of fact. A three-member panel is chosen from among the standing Appellate Body of seven Member country representatives appointed by the DSB. Reports are due within 60 to 90 days, although often take longer.

panel's report on issues of law and legal interpretations.[361] If a violation is found to exist, the Appellate Body shall recommend compliance with the agreement(s).[362] The DSB is deemed to have adopted the Appellate Body report and the parties *unconditionally accept* the Appellate Body report, unless it is rejected by reverse consensus, meaning all members present at the DSB meeting formally object to its adoption.[363]

Although there is no explicit requirement in the DSU to follow prior precedent, also called *stare decisis*, the WTO Agreement encourages adherence to the practices and jurisprudence of GATT, and specifically Article XVI of the WTO Agreement provides that the WTO "shall be guided by the decisions, procedures and customary practices" followed under GATT.[364] In practice, the panels and Appellate Body place great weight on their prior decisions with detailed discussions and citations to past decisions.[365] Additionally, the Appellate Body regularly relies upon the Vienna Convention on the

[361] There is ongoing discussion regarding the level of deference the Appellate Body should give towards Member decisions and actions, World Trade Organization, The Future of the WTO: Addressing institutional challenges in the new Millennium ("Sutherland Report") (2004) 51.

[362] WTO Agreement, Annex 2 (DSU), Articles 3, 17, 19, 21, 22 (1995). In addition to recommending a Member come into compliance with an agreement, the Appellate Body may suggest ways the Member could implement the Appellate Body's recommendations. The response to a violative measure, first and mandatorily, is immediate "withdrawal of the measures concerned if these are found to be inconsistent with the provisions of any of the [WTO] covered agreements. Compensation is possible, prospectively only. As a last resort, and only with prior approval of the DSB, the aggrieved Member may use trade sanctions against the offending Member. For discussion why Members are willing to forego remedies from the date of violation for trade system stability, see Petros Mavroidis, "Dispute Settlement in the WTO. Mind Over Matter," Robert Schuman Centre for Advanced Studies Research Paper No. RSCAS 2016/04, Columbia Public Law Research Paper No. 14-500 (1 January 2016) <http://ssrn.com/abstract=2727131> accessed 30 May 2016.

[363] WTO Agreement, Annex 2 (DSU), Article 16:4 and 17:14. Reverse consensus is different than the negative consensus applied at the panel report stage. Both are unique approaches and contribute to WTO dispute resolution process success.

[364] WTO Agreement, Article XVI.

[365] For a discussion of the importance of precedent in Appellate Body decisions, as well as an analysis of the small proportion of WTO members involved in the cases and driving the decisions, see Joost Pauwelyn, "Minority Rules: Precedent and Participation Before the WTO Appellate Body" (31 July 2014) <http://ssrn.com/abstract=2474611> accessed 5 August 2014.

Law of Treaties for the customary rules on interpretation of treaties, although WTO law is itself a *lex specialis*.

3. Most-Favored Nation Status, National Treatment and the Article XX Exceptions

As stated in the Preamble to the WTO Agreement, non-discrimination in international trade is a primary goal of the WTO, and is commonly referred to as the cornerstone of the GATT.[366] There are two main obligations towards this non-discrimination goal: most favored nation status and non-preferential national treatment. Article I:1 of GATT 1994 contains the most favored nation (MFN) status requirement. MFN requires that, if a Member gives any privilege or immunity such as preferential duties or taxes or import/export treatment,[367] to one country's product then the Member must provide the same privilege or immunity to like products from any other Member "immediately and unconditionally."[368] This MFN requirement is repeated throughout GATT and other annexed agreements,[369] and is regarded as "one of the pillars of the WTO trading system."[370] As with other non-discrimination obligations, this MFN requirement prohibits both de jure (in law) and de facto (in fact) discrimination.[371] Article III of GATT 1994 contains the national treatment requirement. Article III not

[366] WTO Agreement, Preamble; Michael J. Trebilcock, Understanding Trade Law (Edward Elgar Publishing Ltd. 2011) 18. As discussed above, the WTO Agreement provides the framework for negotiating, administering and resolving disputes arising from trade agreements. The GATT, revised in 1994, continues to remain in place as a general trade agreement, the terms of which are enforced through the WTO.

[367] Peter Van den Bossche and Werner Zdouc, *The Law and Policy of the World Trade Organization* (Cambridge University Press 3rd Ed. 2013) 320-330.

[368] GATT 1947, Article I:1.

[369] GATT 1947 Article III:7; GATT 1947 Article V; GATT 1947 Article IX:1; Peter Van den Bossche and Werner Zdouc, *The Law and Policy of the World Trade Organization* (Cambridge University Press 3rd Ed. 2013) 317.

[370] EC – Tariff Preferences case, Appellate Body Report, WT/DS246/AB/R (4 July 2004).

[371] Canada – Pharmaceutical Patents case Panel Report, WT/DS114/R (17 March 2000); Peter Van den Bossche and Werner Zdouc, *The Law and Policy of the World Trade Organization* (Cambridge University Press 3rd Ed. 2013) 319.

only prohibits Members from treating domestic products more favorably than imported products, but also affirmatively requires imported products from other Members be treated "no less favorable" than domestically produced like products.[372] Article XI of the WTO Agreement generally prohibits quotas, import/export restrictions or other quantitative restrictions.[373]

Article XX of GATT 1994 contains an important set of exceptions to the otherwise enforceable proscriptions against certain anti-trade measures that may be adopted by Members. Article XX begins with its own sort of preamble, called the chapeau.[374] This chapeau states the Article XX exceptions are "[s]ubject to the requirement that such [excepted] measures are not applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between countries where the same conditions prevail, or a disguised restriction on international trade." This preamble was inserted to address the concern of indirect protectionism.[375]

Article XX goes on to list several available exceptions, including for measures affecting trade that are put in place for purposes of, among other things, protecting public morals, measures relating to trade in gold and silver, products of prison labour, and protection of national treasures. For purposes of sustainable development, the primary exceptions at issue are subsection (b) relating to measures necessary to protect human, animal or plant life or health and subsection (g) relating to the conservation of

[372] GATT 1947 Article III:2 and Article III:4.
[373] WTO Agreement, Article XI; Michael J. Trebilcock, Understanding Trade Law (Edward Elgar Publishing Ltd. 2011) 17.
[374] For a good general discussion of Article XX chapeau, see Lorand Bartels, "The Chapeau of Article XX GATT: A New Interpretation," University of Cambridge Faculty of Law Research Paper No. 40/2014 (14 July 2014) <http://dx.doi.org/10.2139/ssrn.2469852> accessed 23 July 2014.
[375] World Trade Organization, Analytical Index to the GATT 563 <https://www.wto.org/english/res_e/booksp_e/gatt_ai_e/art20_e.pdf> accessed 19 September 2015.

exhaustible natural resources. Article XX(b) of GATT permits WTO Members to adopt or enforce measures necessary to protect human, animal or plant life or health, *provided* the measures are not applied as a means to arbitrarily or unjustifiably discriminate between countries, or as a disguised restriction on international trade.[376] Article XX(g) of GATT permits WTO Members to adopt or enforce measures relating to conservation of exhaustible natural resources if the measures are in conjunction with domestic production or consumption restrictions, again *provided* the measures are not applied as a means to arbitrarily or unjustifiably discriminate between countries, or as a disguised restriction on international trade.[377] At the time the Article XX(b) language was approved, the primary concerns were quarantine and similar sanitary measures intended to protect human, animal and plant health, which the parties agreed should not be adopted as a disguised restriction on trade.[378] Little history is available regarding Article XX(g), and prior to the *China – Rare Earths* case had only been discussed in depth with respect to dolphin protection and domestic clean air.[379] The standard framework for analyzing whether a trade restriction is permitted under Article XX(b) or (g) is a two-step process: (1) does the restriction fall within and meet the requirements of Article XX(b) or (g), and (2) does the restriction satisfy the requirements of the preamble, meaning it is not applied as "a means of arbitrary or unjustifiable discrimination between

[376] GATT 1994, Article XX. Article XX(b) states simply: "necessary to protect human, animal or plant life or health."
[377] GATT 1994, Article XX. Article XX(g) states, "relating to the conservation of exhaustible natural resources if such measures are made effective in conjunction with restrictions on domestic production or consumption."
[378] World Trade Organization, Analytical Index to the GATT 565 <https://www.wto.org/english/res_e/booksp_e/gatt_ai_e/art20_e.pdf> accessed 19 September 2015.
[379] World Trade Organization, Analytical Index to the GATT 585-86 <https://www.wto.org/english/res_e/booksp_e/gatt_ai_e/art20_e.pdf> accessed 19 September 2015.

countries where the same conditions prevail," and is not "a disguised restriction on international trade."

Several WTO Disputes Give Meaning to Article XX

Prior to the WTO, Article XX was referenced in GATT proceedings, most notably Canada – Measures Affecting Exports of Unprocessed Herring and Salmon.[380] In the *Canada - Herring/Salmon* proceeding, Canada argued that requiring domestic processing of certain salmon and herring species was for purposes of conservation of exhaustible natural resources. While the United States did not dispute that the fish were exhaustible natural resources, it argued, and the panel agreed, that requiring domestic processing was not primarily for conservation purposes. Following the prior GATT proceedings, several early WTO disputes also addressed Article XX, most notably *US – Gasoline*, *US – Shrimp*, *Brazil – Retreaded Tires* and *European Communities – Asbestos*.

In *US – Gasoline*, one of the earliest WTO disputes, Venezuela and Brazil argued certain terms of a United States law, the Clean Air Act Amendments of 1990, violated Articles I and III of GATT 1994.[381] The United States argued the provisions treating some foreign refiners different than others did not violate Articles I or III, and also argued Articles XX(b) and (g) applied to the provisions.[382] With respect to Article XX(b), the United States argued *without* opposition from Venezuela or Brazil that the Clean Air Act Amendments were adopted to protect human, animal and plant life or

[380] Canada – Measures Affecting Exports of Unprocessed Herring and Salmon ("Canada – Herring/Salmon"), Panel Report, L6268 (20 November 1987, adopted 22 March 1988) <https://www.wto.org/english/tratop_e/dispu_e/gatt_e/87hersal.pdf> accessed 31 July 2017. This and other pre-WTO cases form part of the GATT jurisprudence followed at the WTO, as discussed above.
[381] United States – Standards for Reformulated and Conventional Gasoline ("US – Gasoline"), Panel Report, WT/DS2/R (29 January 1996).
[382] US – Gasoline, Panel Report, WT/DS2/R (29 January 1996) 7, para. 3.8, pp. 8-9, paras. 3.17-3.21.

health.[383] With respect to Article XX(g), the United States argued clean air was an exhaustible natural resource.[384] The Appellate Body found that the gasoline measures at issue were "relating to" conservation of exhaustible natural resources and the United States law met the requirements of Article XX(g).[385] However, the Appellate Body then found the United States failed to meet its burden to show the measure met the requirements of the chapeau of Article XX, the "good faith" requirement, because the differential treatment as between domestic and imported oil were unjustified and were a disguised restriction on international trade.[386] The Appellate Body closed its opinion by stating:

> [this decision] does not mean, or imply, that the ability of any WTO Member to take measures to control air pollution or, more generally, to protect the environment, is at issue. That would be to ignore the fact that Article XX of the *General Agreement* contains provisions designed to permit important state interests – including the protection of human health, as well as the conservation of exhaustible natural resources – to find expression...[387]

[383] US – Gasoline, Panel Report, WT/DS2/R (29 January 1996) 15, para. 3.39. The panel determined the measure itself was not "necessary" to fulfill the policy objective for Article XX(b). The panel defined "necessary" as the existence of no alternative measures that were either consistent with or at least less inconsistent with the GATT requirements. For Article XX(b) application, the panel determined the United States bore the burden to prove (1) the policy underlying the measure at issue fell within a range of policies designed to protect human, animal or plant life or health, (2), the measure was necessary to fulfill the policy objective, and (3) the measure met the requirements of the Article XX chapeau. US – Gasoline, Panel Report, WT/DS2/R (29 January 1996) 38-43, paras. 6.21-6.34. The United States did not appeal the panel's rejection of its Article XX(b) argument.

[384] US – Gasoline, Panel Report, WT/DS2/R (29 January 1996) 22-23, paras. 3.59-3.62. Venezuela disputed that clean air was an exhaustible natural resource, "clean" air being a condition of the air and not itself a natural resource, and argued the gasoline regulations were not "primarily aimed at" preservation of natural resources. The panel ruled in favor of the United States that "clean air" was an exhaustible natural resource, and ruled in favor of Venezuela that the gasoline restrictions at issue were not "primarily aimed at" conservation of exhaustible natural resources. US – Gasoline, Panel Report, WT/DS2/R (29 January 1996) 44-46, paras. 6.36-6.41.

[385] US – Gasoline, Appellate Body Report, WT/DS2/AB/R (29 April 1996) 16-21.

[386] US – Gasoline, Appellate Body Report, WT/DS2/AB/R (29 April 1996) 25-27.

[387] US – Gasoline, Appellate Body Report, WT/DS2/AB/R (29 April 1996) 30.

In *US – Shrimp*, the WTO Appellate Body upheld application of Article XX in the context of a United States domestic environmental program. Several Asian countries complained about part of a United States law intended to protect sea turtles by banning importation of shrimp harvested from countries that lacked domestic programs to protect against incidental capture of sea turtles, such as use of turtle-friendly nets.[388] The United States argued its law was permitted pursuant to the Article XX(b) and XX(g) exceptions because it was intended to protect sea turtles as an endangered species, and the law's requirements were related to sea turtle protection because shrimp trawling nets were a major cause of human-induced sea turtle deaths.[389] The Appellate Body found that sea turtles can be considered "exhaustible natural resources,"[390] and found the United States law had a sufficiently close connection between the measure at issue and the exhaustible natural resource to be protected.[391] The Appellate Body next analyzed the chapeau to Article XX and found the law's implementing guidelines as written constituted

[388] WT/DS58/AB/R, 12 October 1998. The law at issue, Section 609 of Public Law 101-162, required U.S. State Department certification and required the rates of incidental taking of sea turtles to be comparable to the incidental rates of sea turtle taking in the United States. The turtle-friendly nets are referred to as TEDs, nets with turtle excluder devices. Countries with environments that do not pose a threat to sea turtles, such as cold water environments, also can obtain certification. Sea turtles were then and continue to be listed as endangered in the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES).

[389] WT/DS58/AB/R, 12 October 1998, Section II.A.2. In deciding the matter, the Appellate Body reiterated its decision in US – Gasoline that measures claimed to meet an Article XX exception must first be analyzed against the claimed exception and then analyzed against the Article XX chapeau. WT/DS58/AB/R, 12 October 1998, Section VI, paras. 6-8.

[390] WT/DS58/AB/R, 12 October 1998, Section VI.B., rejecting appellees' argument that Article XX(g) only applied to non-living natural resources such as minerals. In interpreting this phrase for Article XX(g), the Appellate Body took into account the 1992 Rio Declaration on Environment and Development, the 1982 United Nations Convention on the Law of the Sea, the 1973 Convention on International Trade in Endangered Species, the 1979 Convention on Conservation of Migratory Species, and the 1992 Convention on Biological Diversity. The practice of looking to other treaties is consistent with the Vienna Convention on the Law of Treaties (1969), Article 31(3)(c), and is consistent with practice of the International Court of Justice, see *Oil Platforms Case*, ICJ Reports (2003) paras 40-41, Case Concerning the *Gabčíkovo-Nagymaros* Project (Hungary/Slovakia) ICJ Reports (1997) 7, paras 140-141; Patricia Birnie, Alan Boyle, Catherine Redgwell, *International Law and the Environment* (Oxford University Press 2009) 20.

[391] WT/DS58/AB/R, 12 October 1998, Section VI.B.

unjustifiable discrimination because "shrimp caught using methods identical to those employed in the United States have been excluded from the United States market solely because they have been caught in waters of countries that have not been certified by the United States."[392] In concluding its decision, the Appellate Body importantly stated:

> In reaching these conclusions, we wish to underscore what we have *not* decided in this appeal. We have *not* decided that the protection and preservation of the environment is of no significance to the Members of the WTO. Clearly, it is. We have *not* decided that the sovereign nations that are Members of the WTO cannot adopt effective measures to protect endangered species, such as sea turtles. Clearly, they can and should. And we have *not* decided that sovereign states should not act together bilaterally, plurilaterally or multilaterally, either within the WTO or in other international fora, to protect endangered species or to otherwise protect the environment. Clearly, they should and do.[393]

Three years later, the Appellate Body determined in the *European Communities – Asbestos* case that France had the right to, and had properly, banned importation of chrysotile asbestos and asbestos-containing products.[394] In particular under Article XX(b), The panel and Appellate Body found clear evidence of the threat to human health

[392] WT/DS58/AB/R, 12 October 1998, Section VI.C. In analyzing this language, the Appellate Body gave life to the Preamble to the WTO Agreement as well, stating: "this language demonstrates a recognition by WTO negotiators that optimal use of the world's resources should be made in accordance with the objective of sustainable development. As this preambular language reflects the intentions of negotiators of the WTO Agreement, we believe it must add colour, texture and shading to our interpretation of the agreements annexed to the WTO Agreement, in this case, the GATT 1994." The Appellate Body also referenced the language of the Decision on Trade and Environment and its citation to the Rio Declaration and Agenda 21.

[393] WT/DS58/AB/R, 12 October 1998, Section VI.C, para. 43. The United States eventually revised its guidelines and process for implementing the law in compliance with the Appellate Body findings. WT/DS58/AB/RW (22 October 2001).

[394] European Communities – Measures Affecting Asbestos and Asbestos-Containing Products, WT/DS135/AB/R (12 March 2001). The French decree at issue prohibited almost entirely the manufacture, processing, import, marketing, export, possession for sale, offer, sale and transfer of title to any asbestos or asbestos-containing products on the grounds of worker and general consumer health. Chrysotile asbestos is highly toxic and harmful to human health, but also is highly heat-resistant and has several industrial and commercial insulating applications. Canada is a major producer of mined asbestos and asbestos-containing products, and contested France's ban.

and life posed by asbestos,[395] and found that less restrictive measures short of a ban existed but would have improperly required France to lessen its desired protection of human health and life.[396] On this latter point, the Appellate Body stated: "it is undisputed that WTO Members have the right to determine the level of protection of health that they consider appropriate in a given situation. France has determined… that the chosen level of health protection by France is a "halt" to the spread of *asbestos*-related health risks [and] the measure at issue is clearly designed and apt to achieve that level of health protection."[397] The Appellate Body decision represents a near total victory for state attempts to protect human life and health by banning certain products that threaten human life and health.

Around this same time, the Appellate Body decided the *Brazil – Retreaded Tires* case, involving a challenge by the European Communities to certain import restrictions on retreaded tires imposed by Brazil.[398] Brazil argued that its import ban on retreaded tires, including associated fines and measures restricting the marketing of imported retreaded tires, as well as an exception for remolded tires from MERCOSUR countries, were all justified under Article XX(b) of the GATT 1994.[399] The Appellate Body, in analyzing the claimed Article XX(b) exception, stated:

> This issue illustrates the tensions that may exist between, on the one hand, international trade and, on the other hand, public health and environmental concerns arising from the handling of waste generated by a

[395] WT/DS135/AB/R (12 March 2001), Section VII. On this point, the Appellate Body stated "all four of the scientific experts consulted by the Panel concurred that chrysotile asbestos fibres, and chrysotile-cement products, constitute a risk to human health, and the Panel's conclusions on this point are faithful to the views expressed by the four scientists.
[396] WT/DS135/AB/R (12 March 2001), Section VII.
[397] WT/DS135/AB/R (12 March 2001), Section VII.
[398] WT/DS332/AB/R (3 December 2007), Section I.
[399] WT/DS332/AB/R (3 December 2007), Section I.

> product at the end of its useful life. In this respect, the fundamental principle is the right that WTO Members have to determine the level of protection that they consider appropriate in a given context. Another key element of the analysis of the necessity of a measure under Article XX(b) is the contribution it brings to the achievement of its objective. A contribution exists when there is a genuine relationship of ends and means between the objective pursued and the measure at issue. To be characterized as necessary, a measure does not have to be indispensable. However, its contribution to the achievement of the objective must be material, not merely marginal or insignificant, especially if the measure at issue is as trade restrictive as an import ban. Thus, the contribution of the measure has to be weighed against its trade restrictiveness, taking into account the importance of the interests or the values underlying the objective pursued by it.[400]

The Appellate Body then upheld the panel's finding that Brazil's law was "necessary to protect human, animal or plant life or health" because it was intended to prevent accumulation of waste tires that pose human health concerns.[401] The Appellate Body then analyzed Brazil's law and the MERCOSUR exception against the chapeau to Article XX, finding the MERCOSUR exception was unjustifiable and arbitrary discrimination and a disguised restriction on trade in violation of the chapeau.[402]

More recently, and just prior to the *China – Rare Earths* case, the United States, European Union and Mexico complained about China's trade restrictions towards certain raw materials in 2009.[403] In the *China – Raw Materials* case, China was called out for violations with respect to export restrictions on the raw materials bauxite, coke, fluorspar, magnesium, manganese, silicon carbide, silicon metal, yellow phosphorous, and zinc, used in the production of aluminum, stainless steel, bronze and brass, fuel,

[400] WT/DS332/AB/R (3 December 2007), Section V.C.1, para. 1.
[401] WT/DS332/AB/R (3 December 2007), Section V.C.1, para. 3.
[402] WT/DS332/AB/R (3 December 2007), Section V.C.2, para. 17 and Section V.C.3.
[403] European Union Request for Consultations, WT/DS395/1 (23 June 2009); Mexico Request for Consultations, WT/DS398/1 (26 August 2009); United States Request for Consultations, WT/DS394/1 (23 June 2009). Panel Report, China – Raw Materials, WT/DS394/R (5 July 2011); Appellate Body Report, China – Raw Materials, WT/DS394/AB/R (30 January 2012).

electronics, semiconductors, as well as metal galvanization and smelting.[404] China's export restrictions on these raw materials were remarkably similar to the export restrictions China placed on rare earths, including export duties, export quotas, export licensing and minimum export price requirements.[405] China invoked Article XX(b) and XX(g), arguing its trade restrictions on the raw materials at issue were in place because the raw materials were exhaustible natural resources, or else the restrictions were for the purposes of reducing pollution and protecting human health.[406] The panel and Appellate Body discussed Article XX(b) and XX(g) at length, as incorporated in the discussion of the *China – Rare Earths* case below. However, the complaining parties successfully argued China could not rely on the defenses in Article XX because they were not available to China based on the terms of China's negotiated WTO Accession Protocol.[407]

Although *European Communities – Asbestos* and *US-Shrimp* are the only cases in which Article XX defenses were successful, the text of all these decisions show the WTO Appellate Body is quite willing to find domestic laws intend to protect human health and environment and conserve domestic natural resources, including sea turtles. Indeed, the panels and Appellate Body routinely find measures that restrict trade are intended to protect human and animal life and health as well as conserve exhaustible natural resources. The Appellate Body will even uphold outright bans on products, such

[404] Appellate Body Report, China – Raw Materials, WT/DS394/AB/R (30 January 2012), para. 1. These raw materials are similar to the Rare Earths and their uses.
[405] Appellate Body Report, China – Raw Materials, WT/DS394/AB/R (30 January 2012), para. 2. China's actions towards raw materials trade also implicated China's allocation and administration of export quotas, export licenses, and minimum export prices, as well as alleged unpublished export measures.
[406] Appellate Body Report, China – Raw Materials, WT/DS394/AB/R (30 January 2012), para. 5.
[407] Appellate Body Report, China – Raw Materials, WT/DS394/AB/R (30 January 2012), para. 307. China has since complied with the DSB's decision. Status Report by China, China – Raw Materials, WT/DS394/19 (7 December 2012).

as asbestos. Where countries get themselves in trouble, it seems, is having different rules for domestic and imported products, for example the US Clean Air Act Amendments that were intended to protect human health and the environment but used overly restrictive means on foreign gasoline refiners compared to domestic refiners.[408] These earlier Article XX decisions form the backdrop for the WTO's consideration of the *China – Rare Earths* case.

China - Rare Earths Case Strengthens Article XX Protections for Human Health and Environment

On 13 March 2012, the United States sought consultation with China regarding trade in various rare earths as well as tungsten and molybdenum.[409] Within two weeks, the European Union and Japan joined in the consultation request.[410] The United States' basis for the request was China's export duties, quantitative restrictions, export licensing requirements, a minimum export price system, and other restrictions on the trade of "rare

[408] These principles remain true, as seen in the European Communities – Measures Prohibiting the Importation and Marketing of Seal Products case, WT/DS400/AB/R (22 May 2014). In this Seal Products case based in part on Article XX(a) relating to public morals, the EC regulation at issue was a ban on import or sale of seal products but with some exceptions for indigenous hunting and scientific purposes. The panel and Appellate Body found the chapeau to Article XX were not met. The panel also found the requirements of Article XX(b) were not met as the EC failed to show the measure was necessary to protect animal life or health. The exceptions to the seal products ban were the most problematic aspect of the regulation for the panel and Appellate Body.

[409] United States' Request for Consultation, WT/DS431/1 (15 March 2012); Jennifer Friedman, "WTO To Investigate China Curbs on Rare Earth Exports" Bloomberg.com (23 July 2012) <http://www.bloomberg.com/news/2012-07-23/wto-to-investigate-chinese-curbs-on-rare-earthexports.html> accessed 9 March 2014 (24 July 2012). The products complained of included the raw and naturally occurring elements themselves as well as certain minimally processed products derived from them, such as oxides, concentrations, salts and metals. Appellate Body Report, WT/DS431/AB/R (7 August 2014) 17, para. 1.2. The complaints did not address semi-finished or finished products containing the elements and their minimally-processed derivatives. Appellate Body Report, WT/DS431/AB/R (7 August 2014) 86, para. 4.11; Clara Gillespie and Stephanie Pfeiffer, "The Debate over Rare Earths: Recent Developments in the WTO Case," The National Bureau of Asian Research (11 July 2012) <http://www.nbr.org/research/activity.aspx?id=261> accessed 9 March 2014.

[410] European Union Request to Join Consultations, WT/DS431/2 (26 March 2012); Japan Request to Join Consultations, WT/DS431/3, 26 March 2012. Canada joined the consultations request, but did not join in the panel request.

earths, tungsten and molybdenum."[411] The United States asserted that China's trade restrictions violated several GATT 1994 articles as well as several provisions of China's Accession Protocol.[412] Consultations occurred in April 2012 but did not resolve the dispute, and the DSB established a single panel for all three disputes at its meeting on 23 July 2012.[413] Several Members reserved their rights to participate in the panel as third parties, including Argentina, Australia, Brazil, Canada, Colombia, India, Indonesia, South Korea, Norway, Oman, Peru, Russia, Saudi Arabia, Turkey, and Viet Nam.[414] Notably, many of these potential third parties have either domestic rare earth reserves or mining interests.

1. *China – Rare Earths* Panel Decision

The panel decision in the *Rare Earths* case was released on 27 March 2014.[415] The complainants alleged China subjects rare earths, tungsten and molybdenum to export

[411] United States' Request for Consultation, WT/DS431/1 (15 March 2012).
[412] United States' Request for Consultation, WT/DS431/1 (15 March 2012).
[413] United States' Request for Establishment of a Panel, WT/DS431/6 (29 June 2012); European Union Request for Establishment of a Panel, WT/DS432/6 (29 June 2012); Japan Request for Establishment of a Panel, WT/DS433/6 (29 June 2012); Note by the Secretariat, WT/DS431/7 (25 September 2012). The Director-General selected the panel members because the parties were unable to reach agreement on the panel composition.
[414] Note by the Secretariat, WT/DS431/7 (25 September 2012).
[415] Panel Report, WT/DS431/R (26 March 2014). As panel submissions are confidential, the panel report is the first opportunity to learn the arguments of the parties, as summarized in the panel report, and the panel's decision. Panel decisions are released to the parties a bit earlier than to the general public due to the time required for official translation. Prior to the China – Rare Earths panel decision being publicly released, the decision was leaked to the press. Lucy Hornby & Shawn Donnan, "WTO rules against China on rare earths export quotas," Financial Times (29 October 2013) <http://www.ft.com/cms/s/0/486d5c68-40b5-11e3-ae19-00144feabdc0.html#axzz2vW0qBTE1> accessed 9 March 2014. In response, and still prior to the panel decision release, Chinese officials were quoted as saying China would appeal, admitting the appeal was at least to allow China to delay when it would be required to comply with the decision. Chuin-Wei Yap, "Beijing Says WTO Rules Against China in Rare Earth Dispute," Wall Street Journal Online (30 October 2013), quoting an e-mail by Mei Xinyu, a China commerce ministry policy analyst, as stating "I think we will appeal, and we will win, or at least get some adjustment time… If we fail, we may remove the export quota policies, but use other methods to control…" <http://online.wsj.com/news/articles/SB10001424052702304527504579167132115793314> accessed 9 March 2014.

duties not allowed by China's Accession Protocol, as well as subjecting the elements to quantitative restrictions such as export quotas.[416] In response, China admitted its export duties violated its Accession Protocol, but claimed in part its export duties and quotas were permitted by GATT 1994 Article XX(b) and Article XX(g).[417]

The panel rejected China's argument that its export duties were "necessary to protect human, animal or plant life or health" pursuant to Article XX(b).[418] The panel recounted the Appellate Body's statement in *Brazil – Retreaded Tires*, that "few interests are more 'vital' and 'important' than protecting human beings from health risks, and that protecting the environment is no less important."[419] The panel outlined the four-step test for application of Article XX(b), (1) whether China's export duties fell "within the range of policies designed to protect human, animal or plant life or health" and whether the export duties had this as the objective, (2) whether the export duties were necessary for protecting human, animal or plant life or health, (3) whether feasible alternatives existed, and (4) whether the measures met the chapeau to Article XX prohibiting arbitrary or

[416] Panel Report, WT/DS431/R (26 March 2014) p. 24, para. 2.9, 2.11 and pp. 30-31, para. 3.1, 3.2 and p. 43, para. 7.31.
[417] For primarily procedural reasons, the panel and Appellate Body both reached substantive decisions on Article XX despite the successful argument in China – Raw Materials that the Article XX exceptions were not available to China based on the terms of its Accession Protocol. The panel and the Appellate Body spent considerable efforts on China's argument that its Accession Protocol and the WTO Agreement, read together, mean that certain parts of the WTO Agreement are available to China. The panel rejected China's argument but the Appellate Body equivocated, finding that the question whether a particular provision of the WTO Agreement or the multilateral trade agreements is to be determined by analysis of each of the relevant provisions. Appellate Body Report, WT/DS431/AB/R (7 August 2014) 109, para. 5.73.
[418] Panel Report, WT/DS431/R (26 March 2014) 56-66. China argued in part that, if Article XX(b) did not apply, this meant that "trade liberalization must be promoted at whatever cost – including forcing Members to endure environmental degradation and the exhaustion of their scarce natural resources." The panel rejected this argument on the ground that protection of the environment is certainly permitted by Members, just not through export duties, at least not without a showing that no other means were available to protect the environment and the export duties would effectively protect the environment.
[419] Panel Report, WT/DS431/R (26 March 2014) 83, para. 7.194.

unjustifiable discrimination between countries and prohibiting disguised restrictions on international trade.[420]

On the first step for Article XX(b), while there was no dispute that mining of rare earths can cause environmental damage and harm to humans, animals and plants,[421] the panel found that China's environmental policy did not link export duties and a pollution reduction objective, and the "mere fact that the export of such products would be taxed does not demonstrate the existence of a link between such taxes and the goal of reducing pollution."[422] The panel noted that China's actions appeared to be intended to promote increased domestic production of high value-added downstream products that use the materials in dispute.[423] On the second step for Article XX(b), the panel determined that the effect of an export duty or tax is, "by definition, to increase the price of the products at issue when destined for consumption outside China."[424] On the third step of the Article XX(b) test, the panel accepted that alternatives were in place in China, but that they nevertheless remained viable alternatives because China could increase or expand

[420] Panel Report, WT/DS431/R (26 March 2014) 73-74, paras. 7.145-7.152.
[421] The panel report discussed quite accurately the rare earth mining process, "production starts with mining of crude ore, which is next milled into fine powder. In order to separate the valuable rare earth metals from the rest of the ore, this powder is floated on water to which chemicals are added. Flotation creates large waste streams, called "tailings," which lead to large ponds called "impoundment areas." These tailings contain toxic substances, including radioactive substances (such as uranium and thorium), fluorides, sulphites, acids, and heavy metals and constitute a major environmental risk. In particular, if the ponds are not sufficiently leak-proof, the tailing ponds may pollute groundwater, affecting humans, animals, and plants in the areas that rely on this water. Moreover, tailing ponds may flood when exposed to heavy storm water or when dams collapse, thus polluting the surrounding soil and water… In addition to water pollution, air may also be polluted due to toxic and radioactive dust from the tailings and waste rock stockpiles." Panel Report, WT/DS431/R (26 March 2014), pp. 73-74, para. 7.149-7.152.
[422] Panel Report, WT/DS431/R (26 March 2014) 76, paras. 7.159, 7.165.
[423] Panel Report, WT/DS431/R (26 March 2014) 78, para. 7.169.
[424] Panel Report, WT/DS431/R (26 March 2014) 79-80, para. 7.172-7.177. When the panel asked China why it only taxed *foreign* consumers if the aim was to protect the environment, China's only answer was that the export tax would increase the price for foreign consumers and reduce foreign consumption, which China stated would reduce total mining and production of the resources.

their application as a viable alternative to the export duties in question.[425] The fourth step of the Article XX(b) test, satisfaction of the chapeau of Article XX, China essentially presented no argument that the chapeau were satisfied, and the panel found the export duties discriminated between foreign countries and domestic consumption in violation of the chapeau.[426]

Having determined that China's export duties were not saved by Article XX(b), the panel moved on to determine if China's export quotas were saved by Article XX(g). With respect to defining "exhaustible natural resource" for Article XX(g), the panel noted the Appellate Body has held clean air, sea turtles, petroleum and various mineral resources all to be "exhaustible natural resources," but had never determined at what stage a raw material ceases to be an "exhaustible natural resource" and becomes a processed good.[427] The panel ultimately dodged the question of the limits on "exhaustible natural resource" for raw materials by determining that the whole phrase "relate to the conservation of exhaustible natural resources" allowed for measures that either directly or indirectly relate to the resources at issue as long as the contested measures support or contribute to conservation of the exhaustible natural resource(s) at issue.[428] In this manner, the panel allowed a very broad reading of the first clause of Article XX(g).

[425] Panel Report, WT/DS431/R (26 March 2014) 81, paras. 7.182-7.187.
[426] Panel Report, WT/DS431/R (26 March 2014) 82, para. 7.190-7.192 and p. 74, para. 7.148. The panel asked whether China agreed that the first restriction of the chapeau applied not only among MFN-status countries but also as between foreign and domestic consumption, and China's ambiguous answer appeared to indicate it agreed, or at least the panel understood China to agree.
[427] Panel Report, WT/DS431/R (26 March 2014) 92, para. 7.249 (citing US – Gasoline, US – Shrimp, and China Raw Materials).
[428] Panel Report, WT/DS431/R (26 March 2014) 92-93, paras. 7.250, 7.365.

The panel also considered whether China's export quotas were made effective in conjunction with restrictions on domestic production or consumption, ultimately finding China failed to show that it had actual restrictions on domestic production or consumption, such that the claimed conservation program was more like a disguised restriction on trade.[429] China further argued that "conservation" included management of resources through *sustainable economic development*, while the United States and others argued Article XX(g) is only intended to protect the "legitimate non-economic objective of conservation," and does not extend to China's promoting its own economic development.[430] Attempting to balance the competing aims of preservation and development of natural resources as well as trade liberalization and state sovereignty, the panel concluded that WTO Members have permanent sovereignty over their natural resources, Members can adopt conservation policies to meet development needs along with present and future sustainable development goals, but not in violation of international obligations including WTO agreements, and not in effect controlling a natural resource market.[431] The panel stated starkly: "WTO Members' right to adopt conservation programmes is not a right to control the international markets in which

[429] Panel Report, WT/DS431/R (26 March 2014) pp. 103-104, paras. 7.301-7.312, pp. 143-154, 158-160, paras. 7.493-7.537, 7.556-7.567. The panel stated "restrictions" means that which has a limiting effect, such as a quantitative limit on domestic production or consumption, consistent with the panel decision in the *China – Raw Materials* case.

[430] Panel Report, WT/DS431/R (26 March 2014). 93-96, paras. 7.252-7.266. The complainants also noted that negotiators rejected a proposal that the GATT Article XX(g) provision allow for measures ensuring domestic access to ample supplies of exhaustible natural resources.

[431] Panel Report, WT/DS431/R (26 March 2014) 96, paras. 7.265-7.268. The panel, not willing to simply rely on the panel decision in the *China – Raw Materials* case, applied the principles of the Vienna Convention on the Law of Treaties and reviewed the dictionary definition of "conservation," the context and purpose of Article XX(g), the WTO preamble, and general principles of state sovereignty including over natural resources as espoused in United Nations General Assembly resolutions and the 1992 Rio Declaration on Environment and Development.

extracted products are bought and sold."[432] Most importantly, the panel stated China can control the amount of rare earths it extracts, but "once resources are extracted and have entered the market, it is neither China's nor any other Member's 'responsibility' or right to allocate the available stock" between domestic and foreign users, because once extracted the rare earths are in commerce subject to WTO law.[433]

With respect to compliance with the chapeau, the panel reiterated the Appellate Body's statements in *US – Gasoline* and *Brazil – Retreaded Tires* that, to qualify for Article XX protection, a measure must both meet the requirements of one or more of the exceptions and meet the chapeau requirement that it "cannot constitute arbitrary or unjustifiable discrimination or a disguised restriction on international trade."[434] The panel noted a measure can fail this test if the measure bears no rational connection to the

[432] Panel Report, WT/DS431/R (26 March 2014) 96, 118, paras. 7.268, 7.375, 7.398-7.403. China claimed a document referred to as *Several Opinions* supported their Article XX(g) claim, but the *Several Opinions* document actually referenced a goal of vigorously developing new rare earth materials and industry. The panel determined the mere reference to laws discussing conservation is insufficient to show the necessary relationship to conservation, especially in light of the simultaneous references to maintaining China's "comparative advantage" in raw materials and rare earths.

[433] Panel Report, WT/DS431/R (26 March 2014) 137, 167, paras. 7.462, 7.605. The panel also discussed at length an "even-handedness" requirement of the second part of Article XX(g). The panel cited the Appellate Body's discussion in US – Gasoline, finding that even-handedness was implicitly required by Article XX(g) but did not require identical treatment, else it would cease to act as an exception to the national treatment obligation. The panel went on to discuss the concept that "even-handedness" is in essence a scrutiny of "whether the measure at issue is truly undertaken for purposes of conservation," The panel found that China was not even-handed in its application of the export quotas, in large part because China's alleged domestic consumption cap actually acted as a consumption assurance by guaranteeing a minimum domestic availability of rare earths. The panel agreed with the panel in China – Raw Materials that a resource-rich state is not obligated to ensure that the economic development of foreign users of the state's natural resources benefit equally or identically as with the resource-producing state. Panel Report, WT/DS431/R (26 March 2014) 105, 108, 165, paras. 7.314-7.330, 7.594-7.595.

[434] Panel Report, WT/DS431/R (26 March 2014) 110-112, paras. 7.337-7.353. With respect to the determination whether a measure results in arbitrary or unjustifiable discrimination, the panel cited past Appellate Body decisions in US – Gasoline and US – Shrimp finding this clause requires looking at the cause or effects of the measure to determine the existence of: (a) discrimination that is different from the discrimination making the measure violative of GATT 1994 in the first place, (b) the discrimination must be arbitrary or unjustifiable in character, and (c) the discrimination must occur between countries where the same conditions prevail, either between exporting Members or between an exporting Member and the importing Member.

claimed objective, or where alternative measures exist that would avoid or diminish the discriminatory treatment.[435] The panel rejected China's argument that a decade-old export quota going unfilled in one year met the chapeau requirements, and China outright failed to show it considered alternatives.[436] In sum, the panel found "China has not demonstrated that the distortion created by the application of its export quota system is incidental to its conservation considerations… [r]ather the discrimination seems to… reflect industrial policy considerations."[437]

2. *China - Rare Earths* Appellate Body Decision

China did not appeal the panel's decision regarding its export duties not being saved by Article XX(b), but did appeal the panel's decision relating to its export quotas and Article XX(g). With respect to Article XX(g), as with the panel, the Appellate Body did not present a definition of "conservation," instead stating it depended on the resource at issue.[438] The Appellate Body also essentially agreed with the panel's decision about the definition of "made in conjunction with restrictions on domestic production or consumption." In particular, the Appellate Body stated this clause requires "governmental measures that are promulgated or brought into effect… [to] limit not only international trade, but must also limit domestic production or consumption," and it is not sufficient that the domestic restriction be hypothetical, although the domestic restriction is not required to be equal to the foreign restriction.[439] The Appellate Body

[435] Panel Report, WT/DS431/R (26 March 2014) 114, paras. 7.352, 7.354.
[436] Panel Report, WT/DS431/R (26 March 2014) 170-174, 180-182, paras. 7.621-7.623, 7.627-7.649, 7.664-7.678.
[437] Panel Report, WT/DS431/R (26 March 2014) 178, para. 7.659. The panel stated it "recalls that more than 80% of rare earths extracted in China are consumed in China. In our opinion, it is difficult to understand the function of an export quota in a satiation where the first threat to conservation is domestic." (para. 7.660).
[438] Appellate Body Report, WT/DS431/AB/R (7 August 2014) 113, para. 5.89.
[439] Appellate Body Report, WT/DS431/AB/R (7 August 2014) 114, para. 5.92 and p. 124, para. 5.134..

also agreed with the panel that, in determining applicability of an exception such as Article XX(g), the text as well as the design and structure of the measure in question should be analyzed, including the predictable effects of a measure.[440] The Appellate Body also stated that within Article XX(g) there is a requirement of "even-handedness" in the imposition of restrictions, but determined the panel was incorrect in considering this a separate requirement rather than a short-hand for the required elements of Article XX(g) itself.[441] Ultimately, the Appellate Body found the panel did not commit legal error when it determined that China's export quotas were not saved by Article XX(g).[442]

3. Divergent International Reaction to Rare Earths Decisions

The United States and European Union predictably remarked favorably on the WTO decisions. EU Trade Minister Karel De Gucht said, "China cannot use export restrictions to protect its own industries or give them a helping hand on the global market at the expense of foreign competitors."[443] The EU further stated in a press release, "[t]he verdict is clear: export restrictions cannot be imposed supposedly to conserve exhaustible natural resources if domestic use of the same raw materials is not limited for the same purpose… the sovereign right of a country over its natural resources does not allow it to control international markets or the global distribution of raw materials."[444] The U.S. Trade Representative Michael Froman stated, "China's decision to promote its own industry and discriminate against U.S. companies has caused U.S. manufacturers to pay

[440] Appellate Body Report, WT/DS431/AB/R (7 August 2014) 115, para. 5.95 and p. 119, para. 5.113.
[441] Appellate Body Report, WT/DS431/AB/R (7 August 2014) pp. 114-115, para. 5.93 and pp. 122-123, paras.5.124-5.127 and p. 126, para. 5.141.
[442] Appellate Body Report, WT/DS431/AB/R (7 August 2014) p. 133, para. 5.169 and p. 152, para. 5.252.
[443] David Jolly, "China Export Restrictions on Metals Violate Global Trade Law, Panel Finds," New York Times (26 March 2014).
[444] European Union Trade Ministry, Press Release, "Chinese restrictions on access to rare earths and other raw materials – WTO rules in EU's favour" (26 March 2014) <http://trade.ec.europa.eu/doclib/press/index.cfm?id=1051> accessed 6 April 2014.

as much as three times more than what their Chinese competitors pay for the exact same rare earths."[445] Industry outside China also applauded the decision. Steel manufacturers, relying in part on rare earths for steel production, also applauded the panel decision. Thomas Gibson of the American Iron and Steel Institute stated, "[t]hese metals include critical raw materials for steelmaking, and the export restrictions clearly favor Chinese producers already dealing with a massive overcapacity in steelmaking."[446]

Despite this general approval of the decision outside China, an important fact remained that the effects of China's 2009 measures already had the effect of reshaping the industry to benefit China by the time of the 2014 decision. Indeed, the length of time required for DSB decision-making is a common criticism, although it took several years for the United States to raise the issue in the first place such that blame also lies there. Confirming the reshaped industry, Shanghai-based business analyst Wei Chishan confirmed what many already suspected, and what China's Ministry of Commerce representative Mei Xinyu reportedly said before the panel decision was released, that "China has managed to restructure its rare earth industry over the past few years by consolidating the resources into larger companies and established a trading platform."[447] Indeed, in January 2014, China said it would promote six consolidated companies to lead rare earths acquisitions as part of the government's attempts "to discourage illegal

[445] United States Trade Representative Michael Froman, Press Release, "United States Wins Victory in Rare Earths Dispute with China: WTO Report Finds China's Export Restraints Breach WTO Rules" (26 March 2014) <http://www.ustr.gov/about-us/press-office/press-releases/2014/March/US-wins-victory-in-rare-earths-dispute-with-China> accessed 6 April 2014.
[446] Brian Wingfield and Sonja Elmquist, "Trade Panel Backs U.S. in China Rare-Earth Mineral Dispute," Bloomberg BusinessWeek (27 March 2014) <http://www.businessweek.com/news/2014-03-26/trade-panel-sides-with-u-dot-s-dot-in-dispute-over-china-s-rare-earths> accessed 28 March 2014.
[447] Brian Wingfield and Sonja Elmquist, "Trade Panel Backs U.S. in China Rare-Earth Mineral Dispute," Bloomberg BusinessWeek (27 March 2014) <http://www.businessweek.com/news/2014-03-26/trade-panel-sides-with-u-dot-s-dot-in-dispute-over-china-s-rare-earths> accessed 28 March 2014.

production and consolidate the industry."[448] Many have accused China of purposefully using the lengthy WTO dispute resolution system to knowingly violate trade agreements for several years during the dispute resolution process. Harvard Law professor Mark Wu noted China's strategy of protecting domestic industry under the guise of environmental protection has worked in many ways despite the WTO decision.[449] Wu points out that China has used this strategy successfully with other products, including semi-conductors and electronic payment systems, imposing trade restrictions and wading through the multi-year WTO process, allowing China's domestic industry to develop with protection for several years before any WTO decision arises, at which point China's domestic industry has already gained significant advantage over foreign competition. Although China has now come into compliance with the *Rare Earths* decision,[450] from the beginning of China's trade restrictions on rare earths in 2009 until the panel body decision in 2014, China successfully protected domestic industries using rare earth products, and lured foreign companies to China with promises of access to and fewer trade restrictions on rare earths.[451] China's compliance also appears to be strictly limited

[448] Brian Wingfield and Sonja Elmquist, "Trade Panel Backs U.S. in China Rare-Earth Mineral Dispute," Bloomberg BusinessWeek (27 March 2014) <http://www.businessweek.com/news/2014-03-26/trade-panel-sides-with-u-dot-s-dot-in-dispute-over-china-s-rare-earths> accessed 28 March 2014. There is some suggestion that China's consolidation in this industry was aimed at curbing local theft, black-market trading, and to consolidate Beijing's power in the market. None of these objectives are permitted in Article XX.

[449] Mark Wu, "A Free Pass for China," New York Times (2 April 2014).

[450] Jerin Mathew, "China abolishes rare-earth export quotas after WTO ruling," International Business Times (5 January 2015) <http://www.ibtimes.co.uk/china-abolishes-rare-earth-export-quotas-after-wto-ruling-1481904> accessed 6 January 2015. In the month following the WTO Appellate Body's decision, China's rare earths exports reportedly increased 31%, see Press Trust of India, "China's rare earth export jumps by 31 pc after WTO ruling," Business Standard (8 September 2014) <http://www.business-standard.com/article/pti-stories/china-s-rare-earth-export-jumps-by-31-pc-after-wto-ruling-114090801005_1.html> accessed 9 September 2014.

[451] Mark Wu, "A Free Pass for China," New York Times (2 April 2014).

to the metals at issue in the *Raw Materials* and *Rare Earths* cases, and China continued protections for other industrial metals not specifically addressed by the WTO.[452]

Going Forward – Protecting Domestic Sustainable Development Programs under Article XX(b) and XX(g)

1. Direct Lessons from the *China - Rare Earths* case for the Mining Industry

Ultimately, the decision on China's Article XX(b) claims in the *Rare Earths* case now makes it quite easy to show that certain products or activities, such as mining rare earths, have negative effects on human health and the environment. China simply failed the other requirements of Article XX(b), such as showing the trade restrictions at issue contributed to protecting human health or the environment or showing that the claimed human health and environmental protections were not simply a disguised trade restriction. Indeed, it was rather obvious from China's own arguments that its export controls and other restrictions on rare earths were intended to protect domestic industry not protect human health or the environment. Thus the decision reaffirmed that Article XX(b) protects *legitimate* programs to protect human health and the environment.

Similarly with respect to conserving exhaustible natural resources pursuant to Article XX(g), the decision in the *Rare Earths* case makes clear that protection of such resources can be done *if* the protection is fairly applied domestically and abroad. The decision on Article XX(g) determined that China's trade restrictions neither related to the

[452] Poly Yam, "China may cancel export quotas on tungsten, molybdenum," Reuters (30 October 2014) <http://www.reuters.com/article/china-metals-quotas-idUSL4N0SP4VT20141030> accessed 31 October 2014. This "bare compliance" problem highlights the continuing issue that gaining compliance through the lengthy WTO process is only partially effective, with countries such as China that are willing to violate trade agreements until made to comply while reaping gains from trade violations until compliance is required. To be fair, other developed countries are not trade innocents, and the WTO has reported an increase in protectionist measures among G-20 countries following the 2008 economic downturn, along with slow willingness to remove the protectionist measures. WTO News, "WTO report says restrictive trade measures continue to rise in G-20 economies" (6 November 2014) <https://www.wto.org/english/news_e/news14_e/trdev_05nov14_e.htm> accessed 6 November 2014.

'conservation' of an exhaustible natural resource nor was it made effective in conjunction with restrictions on domestic production or consumption. The panel directly stated that "WTO Members' right to adopt conservation programmes is not a right to control the international markets in which extracted products are bought and sold."

Based on the *Rare Earths* case outcome, it seems clear that the WTO's reach for Article XX goes all the way back to minerals in the ground, despite the long-standing principle that countries are free to use their domestic natural resources as they please. The true answer, as far as the WTO is concerned, appears to be that countries are free to conserve or dispose of their domestic natural resources as they please *unless* they do so in a feigned, protectionist or discriminatory manner. In other words, states still have sovereignty over their domestic natural resources but states possessing natural resources cannot exercise their sovereignty in a manner that benefits the domestic market or impacts the international market for the natural resource. This is perhaps especially true for rare earths, and perhaps in the future for animals or insects capable of producing life-saving medicines. This outcome may seem counterproductive for environmental goals, as absent an outright ban this position encourages or requires domestic *and* foreign use of exhaustible natural resources. However, if development and exploitation of exhaustible natural resources is being used for domestic industrial development in a protectionist manner, there is no effective conservation of the natural resources anyway, it is merely exhaustion of the natural resource in a discriminatory manner. Therefore, a WTO-compliant and environmentally-sound domestic program to protect exhaustible natural resources must include protections on the actual extraction and use of such resources irrespective of domestic or foreign purchase and consumption.

A primary question following these WTO decisions is what they mean for domestic environmental and sustainable development needs and programs. At the outset, it is clear that claimed threats for human, animal and plant life and health will be given broad latitude, if the claimed threats are challenged at all. Likewise, the definition of "exhaustible natural resources" will likely include not only pre-processed metals and minerals but also animal species like seals and dolphins, clean air, surface and ground water, drinking water, and possibly productive agricultural soils and protection of pristine natural resources such as coral reefs. The primary reason domestic environmental and sustainable development programs may be rejected by the WTO is when they restrict foreign operations more than domestic operations or, in the *Rare Earths* case, actually are designed to protect domestic operations.

With these guideposts in mind, it is useful to consider some common sustainable development tools applied to the mining industry and whether they would withstand WTO scrutiny. For the mining industry, an increasingly common sustainable development requirement is pre-project environmental impact assessments.[453] These EIAs help identify potential environmental impacts and, ideally, provide national or local governments information to require mitigation activities, such as mine solid waste containment or remediation plans. Provided EIAs are required of proposed mining operations regardless whether domestic or foreign company sponsored, EIA requirements are quite likely to be afforded Article XX(b) protection even if they inhibit trade. Another common sustainable development requirement for mining operations is mine wastewater treatment to avoid metal-laden water leaching into ground water or

[453] Recall also the Espoo Convention, requiring EIAs for projects with cross-border impacts.

drinking water sources, damaging human health and the environment. A domestic law requiring mining operations, or mining operations of a certain size, to properly treat mine wastewater may likely be afforded Article XX(b) protection provided domestic and foreign mining operations are treated equally in the law. One possible area of challenge is if mining operations of a certain size are excluded from the requirement and a state can show that only domestic mining operations fall below the size limit while foreign operations do not, but this would be a case by case basis.

It is important to note that foreign mining companies cannot themselves file WTO disputes, the companies must have sufficient political clout or domestic support to have a government bring a dispute. The disputes brought to the WTO to date involve only larger industries and larger companies, indicating only those will have sufficient government support to even raise WTO disputes. This fact potentially leaves states able to enact protectionist or discriminatory trade measures in smaller industries and sectors.

2. Extending Lessons from the *China - Rare Earths* Case to General Domestic Sustainable Development Programs

The *Rare Earths* case and current status of the WTO's acceptance of sustainable development programs under Article XX allows for some extrapolation or extension beyond the mining industry.

As a more general example, according to the World Health Organization, one of the leading killers in the developing world is urban air pollution from vehicles, industry and energy production, and killing approximately 800,000 people annually.[454] Urban air pollution is a direct by-product of development, and therefore a key factor to address in

[454] World Health Organization, "Environment and Health in Developing Countries" <http://www.who.int/heli/risks/ehindevcoun/en/> accessed 19 September 2015.

any sustainable development program. A major component of urban air pollution comes from vehicles, including motorbikes, cars and trucks. These vehicles burn gasoline, resulting in engine emissions that pollute the air. Many of the cars and trucks also have low gas mileage rates, meaning more gasoline is burned in the engines to go the same distance as compared to higher gas mileage vehicles. The United States has attempted to regulate vehicle pollution in a variety of ways, including vehicle manufacturer fleet combined average fuel economy (CAFE) standards and gasoline emission effects regulations on gasoline refineries and importers. These efforts have been found to violate trade agreements despite their major role in addressing climate change and sustainable development. First in 1994, prior to the effective date of the Marrakesh Agreement, the EU pursued a case against the United States for its CAFE standards, arguing the standards violated GATT Article III and were not justifiable under Article XX(g).[455] A GATT panel found the CAFE standards, specifically the required separate accounting for foreign versus domestic manufactured fleets, discriminated against foreign manufactured vehicles and foreign manufacturers, and was not justified under Article XX(g).[456] However, the same panel found that the United States' "gas guzzler" tax on all foreign and domestic vehicles attaining less than 22.5 mpg were consistent with Article III.[457] The panel report was circulated in October 1994 but not adopted,[458] and the United States CAFE standards remain in effect. In *US – Gasoline*, just one year

[455] World Trade Organization, United States – Taxes on Automobiles case, summary <https://www.wto.org/english/tratop_e/envir_e/edis06_e.htm> accessed 19 September 2015.
[456] World Trade Organization, United States – Taxes on Automobiles case, summary <https://www.wto.org/english/tratop_e/envir_e/edis06_e.htm> accessed 19 September 2015.
[457] World Trade Organization, United States – Taxes on Automobiles case, summary <https://www.wto.org/english/tratop_e/envir_e/edis06_e.htm> accessed 19 September 2015.
[458] World Trade Organization, United States – Taxes on Automobiles case, summary <https://www.wto.org/english/tratop_e/envir_e/edis06_e.htm> accessed 19 September 2015.

later but after the Marrakesh Agreement came into effect, Venezuela and Brazil challenged United States Environmental Protection Agency rules on the composition and emissions effects of gasoline, mainly pegged to 1990 levels, but allowing domestic refiners and producers to establish an individual refinery baseline, while importers and blenders were required to follow a statutory baseline.[459] In just the second case for the new WTO dispute settlement system, the panel and then the Appellate Body found in favor of Venezuela and Brazil, the DSB adopted the findings, and the United States agreed to amend its rules consistent with the WTO decision.[460] These cases, in conjunction with the more recent *China – Rare Earths* case, indicate that domestic air pollution prevention programs can address extra-territorial sources of pollution provided the domestic sources of pollution are at least equally if not more strictly regulated. This is significant today because the climate change plans agreed in Paris in 2015[461] will require countries to adopt significant air pollution prevention programs, and provided the programs are equitable between foreign and domestic air pollution sources the programs should withstand any WTO scrutiny.

According to the same World Health Organization report discussed above, another major health threat in the developing world is lead exposure, killing over 230,000 people per year and causing cognitive problems in up to one-third of the world's children, 97% of those children affected are in the developing world.[462] Lead is a major

[459] World Trade Organization, United States – Standards for Reformulated and Conventional Gasoline case, WTO Case Nos. 2, 4, WT/DS2/9 (20 May 1996).
[460] World Trade Organization, United States – Standards for Reformulated and Conventional Gasoline case, WTO Case Nos. 2, 4, WT/DS2/9 (20 May 1996).
[461] United Nations Framework Convention on Climate Change, FCCC/CP/2015/L.9/Rev.1 (12 December 2015).
[462] World Health Organization, "Environment and Health in Developing Countries" <http://www.who.int/heli/risks/ehindevcoun/en/> accessed 19 September 2015.

industrial component and product, and an important component for a developing society. The deleterious effects of lead on human health and environment, including use of lead in pipes and in paints and lead leaching into drinking water, also make restrictions on lead products another important issue to address as part of sustainable development initiatives. One obvious domestic solution is to restrict importation of goods and products containing lead, especially in children's products, component parts that may end up in children's products, and lead products likely to involve child exposure such as in drinking water. However, while necessity may be relatively easy to prove, any restrictions on importation of lead-containing products and materials will almost certainly be found to violate the WTO's non-discrimination principles unless accompanied by nearly identical restrictions on domestic lead-containing products and materials. For developing countries, domestic economic and industrial development is a primary goal for government and society, so while restrictions on importation of lead products or materials may be acceptable or even popular in the domestic political climate, commensurate domestic restrictions would be necessary to allow any such legal scheme to pass WTO scrutiny. Perversely, this may inhibit developing countries from enacting restrictions on lead-containing products due to potential impacts on domestic industrial development or domestic industrial political resistance.

Yet another major health threat in the developing world according to the World Health Organization is accidental poisonings, killing an estimated 355,000 people globally each year, with two-thirds of these deaths in developing countries.[463] The World Health Organization has determined that a large portion of these poison deaths are

[463] World Health Organization, "Environment and Health in Developing Countries" <http://www.who.int/heli/risks/ehindevcoun/en/> accessed 19 September 2015.

due to excessive exposure to and inappropriate use of toxic chemicals and pesticides.[464] Use of chemicals, including toxic chemicals, goes hand-in-hand with industrial development, and negative health and environmental consequences are a significant concern underlying any sustainable development program. The health threat of chemical exposure and poisoning also has direct application to the mining industry because mining necessarily utilizes toxic chemicals in its operations. One obvious domestic environmental response to this threat is to limit the importation of and regulate the use of industrial chemicals. However, any restriction on the importation of industrial chemicals without an equivalent domestic restriction on production of industrial chemicals will surely violate the WTO's non-discrimination principle. Focusing domestic regulation on the proper use and disposal of industrial chemicals is a possible alternate approach. Assuming a domestic environmental program treats the use and disposal of industrial chemicals the same regardless whether domestically or foreign produced, domestic regulations restricting the time, place and manner of industrial chemical use, storage or containment, and disposal should be perfectly acceptable for WTO purposes.

3. Special Impacts Exist for Sustainable Development Programs in Developing Countries

Unfortunately, the foregoing analyses highlight the fact that domestic environmental and sustainable development programs are unlikely to be able to have meaningful domestic and extra-territorial effects and still meet WTO requirements *without* having potential domestic development consequences for developing and least developed countries. For example, domestic chemical use and disposal regulations may

[464] World Health Organization, "Environment and Health in Developing Countries" <http://www.who.int/heli/risks/ehindevcoun/en/> accessed 19 September 2015.

be beyond the technical capacity or financial reach of domestic mining operations, leaving only foreign-owned mining operations able to comply with the requirements to the detriment of domestic industrial development. For further example, lead products and lead-containing components are simultaneously harmful to human health and the environment and necessary for domestic industry and manufacturing, such that restrictions on domestic use of lead products will likely meet heavy domestic resistance. Developing and least developed countries will continue to be reluctant to adopt sustainable development policies and programs that have the potential for negatively impacting domestic industry and development efforts, but any programs protecting domestic industrial development will not pass WTO scrutiny. This reluctance mirrors the reasons developing countries adopt trade-restrictive measures in the first instance, including protecting domestic industry and jobs, assisting new industry development, generating government revenue, national stability and security and other non-economic goals.[465]

The WTO Committee on Trade and Environment's annual report highlights the ongoing distrust between developed and developing countries regarding sustainable development programs:

> Following the Republic of Korea's report on national emissions trading and Norway's report on carbon dioxide taxing of offshore oil operations: "Some Members supported these initiatives and welcomed such exchanges of experiences, while some others raised questions with regard to the following issues: the contribution of such measures to sustainable development; the risk that they affect developing countries' trade; … and

[465] Peter Van den Bossche and Werner Zdouc, *The Law and Policy of the World Trade Organization* (Cambridge University Press 3rd Ed. 2013) 22-23.

> the importance of addressing global environmental problems multilaterally rather than unilaterally.[466]

Similarly, following discussion of draft ISO 14067 regarding carbon footprint calculation, the statement was made:

> The following points were made in this regard: the negative vote on the draft standard that took place on 6 June 2012 reflected the complexity of the matter; such standards could become market barriers, in particular to products from developing countries; standard setting at the ISO should be a transparent, inclusive process, taking into consideration the needs and difficulties of developing countries; and the importance of reaching agreement through the competent multilateral bodies in order to avoid the adoption and proliferation of unilateral measures.[467]

Additionally, following an EU report on combating illegal, unreported and unregulated (IUU) fishing, the statement was made:

> Some Members welcomed this initiative and thanked the European Union for such exchange of experience, while some others raised concerns with respect to the following issues: the importance of avoiding trade barriers to products from developing countries; the need to address this problem multilaterally; the difficulty to define illegal fishing; and the importance to provide technical assistance to developing countries with respect to the implementation of this measure.[468]

The reluctance of developing countries regarding sustainable development measures is evident in the discussion of each of these topics with the Committee on Trade and Environment. An obvious question, then, is whether and how the WTO can assist developing and least developed country members to adopt sustainable

[466] World Trade Organization, Report of the Committee on Trade and Environment, WT/CTE/19 pp. 1-2 (5 December 2012).
[467] World Trade Organization, Report of the Committee on Trade and Environment, WT/CTE/19 p. 2 (5 December 2012).
[468] World Trade Organization, Report of the Committee on Trade and Environment, WT/CTE/19 p. 2 (5 December 2012).

development policies and programs that simultaneously mitigate some or all of the negative impacts on domestic industry and development.

4. Opportunity to Expand WTO Technical Assistance to Developing Country Members

The Article XX cases, including the *Rare Earths* case, highlight the possibilities and limits on domestic sustainable development programs impacting international trade obligations. As discussed above, one clear consequence is hindrance of a developing country's ability to protect domestic industry, including mining, in the name of sustainable development and at the expense of trade obligations. However, developing country WTO members are understandably reluctant to adopt domestic sustainable development policies or programs that disadvantage domestic industry. One potential means of overcoming developing country reluctance to adopt sustainable development measures is providing evidence-based market research and technical assistance to developing countries that indicates the benefits of or mitigates negative impacts on domestic development.

While several trade agreements discuss provision of technical assistance to developing country members, including the Sanitary and Phytosanitary Measures (SPS) Agreement and the Technical Barriers to Trade (TBT) Agreement,[469] the WTO did not have a clear mandate or concerted effort towards providing technical assistance until the Doha Ministerial Conference in November 2001.[470] At Doha, the WTO declared "technical cooperation and capacity building are core elements of the development

[469] Recognizing the needs of developing and least developed countries, several agreements also provide extended timeframes for compliance and provisions for technical assistance, such as the Trade-Related Aspects of Intellectual Property Rights (TRIPS) agreement.
[470] Ministerial Conference, Doha Ministerial Declaration, WT/MIN(01)/DEC/1 (20 November 2001).

dimension of the multilateral trading system."[471] Since 2002, the WTO has provided trade-related technical assistance in a variety of contexts to develop participant understanding and autonomy, including online learning courses,[472] regional trade seminars,[473] advanced trade seminars in Geneva, technical support missions, support for academic programs in developing country universities, and other activities.[474] The WTO has developed a strong system and network for technical assistance in developing countries, and the WTO's near universal coverage provides an advantage. However, currently the WTO focuses its technical assistance only on allowing developing and least-developed countries to gain basic then advanced understanding of the WTO system.

Going forward, the WTO's technical assistance program could be greatly expanded to form the basis for add-on technical assistance through cooperation with other public international institutions. For example, a module on domestic environmental programs could be added to the existing WTO technical assistance program, developed in conjunction with the United Nations Environment Programme.[475] Similarly, a module on the trade-related Sustainable Development Goals could be added in conjunction with the United Nations Conference on Trade and Development. Additionally, industry-specific technical assistance could be added to the WTO's technical assistance program. For example, an education program for developing

[471] Ministerial Conference, Doha Ministerial Declaration, WT/MIN(01)/DEC/1 (20 November 2001), para. 38.
[472] Online courses include topics such as WTO accession, agriculture and the WTO, copyrights and patents and the WTO, various specific trade agreements, trade and development and trade and environment, among other topics <https://ecampus.wto.org/search.asp?lang=En> accessed 7 February 2016. Funding for technical assistance comes from voluntary contributions to a Global Trust Fund.
[473] Regional seminars cover many of the same topics as online courses but in more depth.
[474] Peter Van den Bossche and Werner Zdouc, *The Law and Policy of the World Trade Organization* (Cambridge University Press 3rd Ed. 2013) 101-104.
[475] Recognizing that additional learning modules or other technical assistance should be demand-driven by the developing countries to avoid resentment or rejection.

countries with economies based substantially on mining that provides technical assistance on best practices for mining laws and mining industry regulation and oversight.

Opportunity to Expand WTO Cooperation with Other Public International Organizations

In order to better implement trade and development goals, the WTO works cooperatively with several other public international institutions, including the International Monetary Fund (IMF) and World Bank Group, the United Nations Conference on Trade and Development (UNCTAD), the United Nations Development Programme (UNDP), the United Nations Environment Programme, and the International Trade Centre (ITC). As discussed in the preceding chapter, the United Nations entities have not necessarily taken advantage of the potential role to be played in sustainable development efforts. However, there is especially significant coordination and cooperation between the WTO, IMF and World Bank, as discussed in the next chapter.

One key strategy among several public international institutions is the Enhanced Integrated Framework for least-developed countries, involving a dedicated fund from donor countries used to identify and implement a domestically-driven trade development agenda.[476] The Enhanced Integrated Framework involves WTO cooperation with the IMF and World Bank, UNCTAD, UNDP and the International Trade Centre. A 2014 review of the Enhanced Integrated Framework noted substantial progress but also room for improvement:

> The evaluation concluded that the programme is relevant to LDCs trade needs and that signs of impact in terms of mainstreaming trade for poverty reduction are emerging, but a longer term horizon is required. It

[476] World Trade Organization website, Enhanced Integrated Framework (EIF) <https://www.wto.org/english/tratop_e/devel_e/teccop_e/if_e.htm> accessed 7 February 2016.

> also found that the effectiveness of the EIF varies among countries, and that there is ample evidence of success in building trade capacity in many LDCs. The evaluation recommended improvements in the EIF efficiency and the inclusion of new dimensions such as linkages with global value chains, further involvement of the private sector and increased activities at the regional level.[477]

The report discusses the need to maintain flexibility and allow focus on aspects of the global value chain rather than merely simple end products such as textiles or basic agricultural products. Another concern is the Enhanced Integrated Framework relies on developed country donations which sometimes fall short of identified needs, while simultaneously domestic funds to support trade development in these least developed countries is limited, placing implementation projects in jeopardy.[478] The EIF should be expanded and strengthened, with a dedicated funding source, to allow the program to reach its full potential.

As further example, the WTO at least occasionally works with other public international institutions, including the International Labor Organization (ILO), World Intellectual Property Organization (WIPO), and others. The WTO and ILO work together on research, statistics and technical assistance projects,[479] and jointly produced a valuable report, "Making Globalization Socially Sustainable," with contributions relating to the effects of globalization on employment, instability and uncertainty, reflecting both

[477] Capra International Inc. and Trade Facilitation Office Canada, "Evaluation of the Enhanced Integrated Framework" (28 November 2014) <http://www.enhancedif.org/en/results/evaluation> accessed 7 February 2016.
[478] Capra International Inc. and Trade Facilitation Office Canada, "Evaluation of the Enhanced Integrated Framework" (28 November 2014) <http://www.enhancedif.org/en/results/evaluation> accessed 7 February 2016. According to the report, there are 23 donor countries supporting the EIF. According to the WTO, in 2007 $170 Million was raised against a goal of $250 Million for the EIF program. <https://www.wto.org/english/tratop_e/devel_e/teccop_e/if_e.htm> accessed 7 February 2016.
[479] Details of cooperation available on World Trade Organization website <https://www.wto.org/english/thewto_e/coher_e/wto_ilo_e.htm> accessed 7 February 2016.

the development potential of globalization as well as the risks and social detriments that can be and are experienced.[480] The WTO also works with the International Trade Centre and the UNCTAD on the Joint Integrated Technical Assistance Program, providing additional technical assistance mainly in developing African countries.[481] Other public international institutions engage with the WTO at official meetings, such as the OECD reporting to the WTO's Committee on Trade and Environment regarding fishing issues.[482] The United Nations Environment Programme, UNCTAD and others also provide communications to the WTO on relevant topics, such as the United Nations Environment Programme work on developing green economy policies and UNCTAD information regarding developing countries capacity to enhance exports of green goods and services in global markets.[483] It is unclear if the communications lead to progress, but at least basic communication is exchanged on some topics. These communications and cross-entity cooperative actions should be expanded through more intentional and organized efforts in order to better support sustainable development goals.

Strengths and Challenges Going Forward for WTO on Sustainable Development

The WTO's reading of Article XX(b) and XX(g) does somewhat limit the ability of a state to claim trade restrictions are for purposes of protecting human health or the environment or conserving exhaustible natural resources. However, the WTO readily accepts environmental and sustainable development programs that legitimately are

[480] Marc Bacchetta and Marion Jansen (eds.), *World Trade Organization and International Labor Organization, "Making Globalization Socially Sustainable"* (2011) <https://www.wto.org/english/res_e/booksp_e/glob_soc_sus_e.pdf> accessed 7 February 2016.
[481] World Trade Organization <https://www.wto.org/english/thewto_e/coher_e/wto_unctad_e.htm> accessed 7 February 2016.
[482] World Trade Organization, Report of the Committee on Trade and Environment, WT/CTE/19 p. 2 (5 December 2012).
[483] World Trade Organization, Report of the Committee on Trade and Environment, WT/CTE/19 p. 2 (5 December 2012).

intended to protect human health or the environment or conserve exhaustible natural resources. It is only when the alleged program is actually used as an excuse for protectionist behavior or improperly discriminates between domestic and foreign activities that the program must be properly non-discriminatory or else run afoul of trade obligations. It is difficult to fault the WTO for its approach. The WTO's provisions are intended to ensure states undertaking steps to protect human health or the environment or sustainable development programs do so genuinely and not as an excuse for protectionist or other anti-trade goals. For development advocates, assuming one believes that free trade promotes domestic development, then such domestic protectionism is ultimately harmful not supportive of development, and therefore is inconsistent with a sustainable development program. But this assumes, sometimes incorrectly, that advocates for sustainable development believe free trade is a component of economic development and therefore sustainable development. This fundamental disagreement over the relationship between free trade and sustainable development is an area in which the WTO could conduct substantially more outreach and education.

More importantly, advocates for environmental protection and sustainable development, rather than condemning the WTO in broad terms, actually should support the WTO's decisions because the WTO is rejecting programs that only use environmental protection as a pretext for protectionist trade practices. Environmental and sustainable development advocates should equally disfavor false claims to environmental and sustainable development programs. Advocates for environmental protection and sustainable development programs likewise should applaud the WTO's broad application of what constitutes threats to human, animal or plant life or health, and

what constitutes natural resources. The WTO's broad interpretations encourage states to likewise take broad views of threats to life or health and the definition of natural resources. States should feel free to protect a broad range of natural resources, including air and endangered animals and water, and also should feel free to broadly protect life or health of people, animals and plants, and NGOs and other advocates should encourage states to do so.

Nevertheless, there are continued legitimate concerns that trade and economic considerations take precedence over human health, environment and other sustainable development goals when programs towards these goals are not wholesale approved by the WTO.[484] Since the WTO's founding it has gained near universal scope, with 159 total Members joining some or all of the WTO, constituting 99.5% of the world's population and 97% of world trade.[485] This near-universal scope and breadth of membership is both impressive and occasionally crippling to the WTO. The WTO Doha Development Agenda, beginning in 2001 and arguably ending in 2015, did not improve this situation. The Doha round intended to include negotiation on issues of trade and environment, The Doha Ministerial Declaration in November 2001 states: "We strongly reaffirm our commitment to the objective of sustainable development… We are convinced that the aims of upholding and safeguarding an open and non-discriminatory multilateral trading system, and acting for the protection of the environment and the

[484] Martin Dixon, Robert McCorquodale, Sarah Williams, *Cases and Materials on International Law* (5th Ed., Oxford University Press 2011) 478.

[485] Peter Van den Bossche and Werner Zdouc, *The Law and Policy of the World Trade Organization* (Cambridge University Press 3rd Ed. 2013) 104-105; World Trade Organization, Member List, <http://www.wto.org/english/thewto_e/whatis_e/tif_e/org6_e.htm> accessed 2 March 2014. WTO Members include most major countries and customs territories, such as Hong Kong. The 159 Members together make up 99.5% of the world population and 97% of world trade, making the WTO the most "universal" of all the international institutions.

promotion of sustainable development, can and must be mutually supportive."[486] However, by the end of 2015 the Doha round saw no developments or agreement in this area.

Ultimately, critics must acknowledge that the WTO began as and continues to be a treaty-based trade organization. Its near-universal membership is due in large part to its focus on trade and resulting economic development. The terms of the Marrakesh Agreement are unlikely to be changed due to lack of consensus towards any major changes. Additionally, to stray far from its fundamental trade role and purpose would likely mean loss of influence on trade, loss of membership, and loss of legitimacy. So, to the extent critics disfavor the WTO's focus on trade, this criticism improperly ignores the fundamental origin and purpose of the WTO. To ask or expect the WTO to go outside its founding documents to an admittedly noble aim is essentially asking the WTO to act beyond its mandate.

Looking beyond the limitations of the Marrakesh Agreement and specific trade agreements, the WTO has made significant efforts towards promoting trade for development goals, including sustainable development. Although perhaps counter-intuitive, the so-called "Battle in Seattle" demonstrations and violence that accompanied the WTO Ministerial Conference in 1999 may have played a role in the WTO's significant efforts towards linking trade and development, including sustainable development.[487] As contained in the Preamble of the Marrakesh Agreement, the crucial importance of the WTO being a *trade for development* organization and not simply a

[486] Ministerial Conference, Doha Ministerial Declaration, WT/MIN(01)/DEC/1 (20 November 2001), paras. 2, 6.
[487] See footnote 7.

trade for trade sake group or worse a group enhancing wealth only for the wealthy. The WTO, through research, technical assistance, education and outreach towards developing and least developed countries, has done much to promote a sustainable development agenda.

Finally, there are at least four steps the WTO could take to address some of the concerns that it promotes trade at the expense of human health, environment and sustainable development. First, as noted above, the WTO can continue and expand its technical assistance, education and outreach on the connection between free trade, economic development and sustainable development. As the Sutherland Report acknowledged, "[i]t is assumed – often wrongly – that we all understand trade is a means to an end, not an end in itself."[488] Second, the WTO's Committee on Trade and Environment could request the Secretariat provide an update on its very useful 2002 Note outlining the requirements of Article XX(b) and (g), to include examples of domestic sustainable development programs that meet these requirements. Third, the WTO's Committee on Trade and Environment could work more closely with relevant United Nations bodies, NGOs, private industry and national governments to outline national laws or policies on particular common topics for human health, environment and preserving natural resources. For example, the WTO could work with the World Bank, UNCTAD and others to prepare a model national law and possible funding package for pre-funding responsible mine closure activities that would likely comply with both trade agreements and sustainable development goals. Fourth, the WTO could work with the World Bank and relevant United Nations bodies towards providing technical assistance

[488] World Trade Organization, The Future of the WTO: Addressing institutional challenges in the new Millennium ("Sutherland Report") (2004) 10.

in drafting national laws promoting sustainable development and protecting exhaustible natural resources. For example, if a state desires to enact a national law to preserve particular metals like copper for future generations, the WTO could be part of a group to provide advisory assistance upon request so the law could be tailored to comply with existing trade obligations.

Specific to the mining industry, while the WTO has made gains towards sustainable development implementation, no WTO work addresses the mining industry. The *Rare Earths* case represents the only WTO attention to mining of technology metals such as rare earths and copper, despite several WTO publications referencing the need to pay attention to the global value chains these metals are part of for development purposes. Certainly the WTO can dedicate more attention to the mining industry given its significant role in economic and sustainable development.

Having discussed the WTO as the leading public international trade organization, including its structural inability to significantly promote sustainable development, the next chapter considers the role of the IMF, World Bank Group and others in this context to determine whether these entities have greater ability and opportunity to promote sustainable development.

Chapter Five

World Bank and International Monetary Fund: Promising Start Towards Sustainable Development

Introduction

This chapter focuses on the last of the best-known public international institutions, including the IMF and World Bank, and the role being played by these institutions in promoting sustainable development in the mining industry. The chapter begins with an overview of the IMF and World Bank, respectively, including an analysis of their current respective roles in promoting sustainable development. In conclusion is an analysis of the current status of strengths and challenges for the IMF and World Bank, and opportunities for growth in promoting sustainable development in the mining industry by these institutions.

International Monetary Fund: A Brief Overview

The International Monetary Fund (IMF) was established in 1944 at Bretton Woods simultaneously with what is called the World Bank Group, a set of entities including the World Bank and International Finance Corporation, with the current mission of international development and poverty eradication.[489] The IMF's specific mission is ensuring a stable international monetary system, including proper monetary exchange rate systems and international payment systems as well as lending to member

[489] World Bank Group <www.worldbank.org> accessed 21 October 2016. Although often called the "World Bank," the World Bank Group consists of five institutions, the original International Bank for Reconstruction and Development (IBRD) which funded reconstruction and re-development following World War II and lends to developing and credit-worthy lower developed countries, the International Development Association (IDA) which provides credits and grants to least-developed countries, the International Finance Corporation (IFC) which arranges financing for development projects, the Multilateral Guarantee Agency (MIGA) provides loan guarantees for foreign direct investment in developing countries, and the International Centre for the Settlement of Investment Disputes (ICSID) which provides a forum for investment dispute resolution. Adopting the commonly-used terminology, this paper uses World Bank to refer to the IBRD and IDA, and World Bank Group to refer to all five institutions.

countries if balance of payments problems arise.[490] The IMF has three main areas of work: (1) global and national economic data collection, analysis and dissemination, (2) technical assistance on macroeconomic issues for borrowers, and (3) financial lending.[491]

The IMF provides financial assistance and lending to countries experiencing balance of payment problems to enable countries to "rebuild their international reserves, stabilize their currencies, continue paying for imports, and restore conditions for strong economic growth, while undertaking policies to correct underlying problems."[492] If needed, IMF member countries request IMF lending and negotiate a loan agreement (such as letters of intent and memoranda of understanding), often with terms requiring reforms to address the cause of the balance of payments issue, the terms of which are determined by the country in consultation with the IMF.[493] The IMF's relevance and importance to global finance has continued and increased since 1944. For example, the IMF has consulted with and provided technical assistance and loans to Greece, Portugal, Ireland and several other developed and developing countries following the 2008 global economic crisis.[494]

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[490] International Monetary Fund, "IMF at a Glance" <https://www.imf.org/external/about.htm> accessed 18 April 2015. The IMF also spends considerable resources monitoring and providing statistical information regarding the global economy.

[491] International Monetary Fund, "IMF at a Glance" <http://www.imf.org/external/about.htm> accessed 14 February 2016. The IMF lends to countries, while the IBRD (World Bank Group) and other development banks lend for projects.

[492] International Monetary Fund, "IMF at a Glance" <http://www.imf.org/external/about.htm> accessed 14 February 2016.

[493] International Monetary Fund, "IMF at a Glance" <http://www.imf.org/external/about.htm> accessed 14 February 2016).

[494] International Monetary Fund, "IMF at a Glance" <https://www.imf.org/external/about.htm> accessed 18 April 2015. IMF loans are intended to assist with temporary balance of payments problems, allowing the borrower countries to stabilize their currencies, continue trading, and correct institutional problems to return to a situation of economic stability and growth. The IMF is different than the World Bank in that it lends for these purposes directly to countries, while the World Bank funds specific projects and activities.

One part of the IMF, the IMF Institute, provides face-to-face instruction on macroeconomic issues at regional training centers and programs throughout the world and at IMF's Washington D.C. headquarters, as well as a wide array of online courses, with a full redesign of course offerings scheduled for 2017.[495] Regional training centers exist on every continent, and the Vienna Joint Training Institute is operated in cooperation with the WTO and World Bank and several European development entities. Training topics include fiscal management, bank supervision, sovereign asset and risk management, tax policy reform, debt management and inclusive growth.[496] However, at present there are no training topics specific to sustainable development, social development, environmental protection or similar topics, although aspects of sustainable development are components of a few training programs such as inclusive growth. Additionally, there are no training topics specific to certain industries such as mining, except two courses on energy and fuel subsidy reform and one course on macro-economic management in resource-rich countries.

IMF's Expanded Mission Towards Sustainable Development

As originally established, the IMF would have little role to play in sustainable development. However, as a result of the 2008 global financial crisis, the IMF's mission was greatly expanded in 2012 to include all macroeconomic and financial sector issues that bear on global security.[497] Consistent with the IMF's expanded mission, sustainable

[495] International Monetary Fund, IMF Institute for Capacity Development 2016 Training Catalog <http://www.imf.org/external/np/INS/english/pdf/catalog2016.pdf> accessed 14 February 2016.
[496] International Monetary Fund, IMF Institute for Capacity Development 2016 Training Catalog <http://www.imf.org/external/np/INS/english/pdf/catalog2016.pdf> accessed 14 February 2016.
[497] International Monetary Fund, "IMF at a Glance" <https://www.imf.org/external/about.htm> accessed 18 April 2015. The IMF has been criticized for "mission creep" and delving into development issues it is not equipped to handle, including by Joseph Stiglitz, *Globalization and Its Discontents* (W.W. Norton & Co. 2002).

development is a growing factor and tool in global security. As early as the 1980s, environmental degradation was being linked to security threats.[498] Desertification, deforestation, overfishing, loss of freshwater and clean water resources, and global climate change all pose grave threats not only to the environment but to all humanity. It is reasonable to conclude, for example, that limited arable land and clean water has contributed to ongoing violence in the Middle East, including Jewish settlers destroying Palestinian orchards during olive harvest, exacerbating ongoing armed conflict.[499] Certainly, local and regional armed conflicts due to environmental scarcities arise frequently, such as violence over valuable shrimp farming areas in Thailand[500] or famine-sparked violence in the failed state of Somalia. These are but a few examples of the global security bases for promoting sustainable development.

One other concrete area of IMF sustainable development work focuses on research, training and promotion of fiscal instruments for environmental protection and sustainable development. Fiscal instruments, including taxes as well as pollution credit and trading systems,[501] are domestically-adopted instruments established to address and

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[498] Sanford E. Gaines, *Sustainable Development and National Security*, 30 Wm. & Mary Envtl. L. & Pol'y Rev. 321 (2006) <http://scholarship.law.wm.edu/wmelpr/vol30/iss2/3> accessed 23 October 2015. Gaines cites the United States' 1980 publication Global 2000 Report to the President and the United States' 1995 National Security Strategy, as well as Thomas Homer-Dixon, *Environment, Scarcity and Violence* (Princeton University Press 1999) as early adopters of the theory that environmental degradation such as scarcity of cropland, fresh water and forests contributes to violence and armed conflict.

[499] William Booth, "In West Bank, Palestinians gird for settler attacks on olive trees," Washington Post (22 October 2014) <https://www.washingtonpost.com/world/middle_east/in-west-bank-palestinians-gird-for-settler-attacks-on-olive-trees/2014/10/21/eb4f5096-54a8-11e4-892e-602188e70e9c_story.html> accessed 23 October 2015.

[500] Sanford E. Gaines, *Sustainable Development and National Security*, 30 Wm. & Mary Envtl. L. & Pol'y Rev. 321 (2006) <http://scholarship.law.wm.edu/wmelpr/vol30/iss2/3> accessed 23 October 2015.

[501] Dirk Heine, John Norregaard, and Ian W.H. Parry, "Environmental Tax Reform: Principles from Theory and Practice to Date," IMF Working Paper WP/12/80 (July 2012) 4-5. As noted in this IMF Working Paper, environmental taxes are not new, rather many countries have employed gasoline and fuel taxes, mining or resource removal taxes, waste discharge/pollution taxes and similar fiscal instruments for decades or

account for the environmental costs of economic development. Fiscal instruments are difficult to implement in part due to domestic or foreign pressure towards revenue generation only, and in part because investors and corporations seeking access to the domestic market demand low costs and low barriers to entry. In short, fiscal instruments such as environmental taxes are perceived as reducing profitability and therefore reducing development. However, properly administered fiscal instruments promote environmental and social protection while allowing development and ensuring environmental costs are borne or shared by appropriate parties. This work, although not specific to the mining industry, does address petroleum and fuel, another extractive industry, and can be adapted to apply to metal and mineral mining.

IMF and the Mining Industry

Unlike most other public international institutions, the IMF has been reporting since at least 2000 that the mining industry can make a significant contribution towards sustainable development. In the December 2000 issue of *Finance & Development* magazine, the IMF reported:

> Because [mining projects] generate sizable revenues, create jobs and business opportunities, and often bring new roads and access to water and power to the isolated rural areas in which they are typically located, they have the potential to stimulate economic growth, reduce poverty, and raise living standards. In addition, host countries benefit from being exposed to best international practices in project planning and implementation and forced to build up their administrative and institutional capacity.[502]

longer. Interestingly, the United States only has 3% of total tax revenue from environmental taxes, while the United Kingdom has just over 6% and the Netherlands has nearly 12%. Recent work, such as in this IMF Working Paper, focuses on determining what ideal tax systems look like in terms of what should be taxed, by how much, at what point in the production chain, as well as what should not be taxed and addressing administrative feasibility and costs.

[502] Kathryn McPhail, International Monetary Fund, "How Oil, Gas and Mining Projects Can Contribute to Development," 37:4 Finance and Development Magazine (December 2000)

This IMF article points to the key factor of partnership between the mining company, national government, regional and local governments and citizen groups, and NGOs to ensure the mining project is planned and carried out in an environmentally, socially and fiscally responsible manner.[503] The IMF article also highlights several notable extractive industries projects, including one by Chevron in Papua New Guinea in which the necessary partnership was achieved with local and national governments and the World Wildlife Fund and the project has proceeded, as well as one by a gold mining company in Venezuela in which partnership was not achieved and lawsuits were filed, stalling the project.[504] The article also discusses social and environmental problems associated with local extractive industry growth, including security needs to address extortion or kidnapping and local civil unrest, sudden population growth due to worker migration, biological and cultural diversity protection, respect for indigenous populations and landowner rights, and corruption-free environmental monitoring needs.[505] The December 2000 article, written well before sustainable development became an international mantra and the driving force of many public international institutions, concludes by stating:

> Although there is little agreement as yet on what constitutes sustainable development, there is agreement that, for projects to benefit host countries, they must, first, be profitable. Second, safeguards must be adopted to minimize damage to the environment and local communities

<http://www.imf.org/external/pubs/ft/fandd/2000/12/mcphail.htm> accessed 18 April 2015. The article built on a previous World Bank study and article, Kathryn McPhail and Aidan Davy, World Bank Discussion Paper, "A Review of Corporate Practices in the Mining, Oil, and Gas Sectors," Discussion Paper No. 384 (1998).

[503] Kathryn McPhail, International Monetary Fund, "How Oil, Gas and Mining Projects Can Contribute to Development," 37:4 Finance and Development Magazine (December 2000) <http://www.imf.org/external/pubs/ft/fandd/2000/12/mcphail.htm> accessed 18 April 2015.

[504] Kathryn McPhail, International Monetary Fund, "How Oil, Gas and Mining Projects Can Contribute to Development," 37:4 Finance and Development Magazine (December 2000) <http://www.imf.org/external/pubs/ft/fandd/2000/12/mcphail.htm> accessed 18 April 2015.

[505] Kathryn McPhail, International Monetary Fund, "How Oil, Gas and Mining Projects Can Contribute to Development," 37:4 Finance and Development Magazine (December 2000) <http://www.imf.org/external/pubs/ft/fandd/2000/12/mcphail.htm> accessed 18 April 2015.

> and to ensure that human rights are protected... Third, projects must build not only physical capital but also social and natural capital, particularly since oil, gas, and mining projects deplete resources and are not, in themselves, sustainable over the long term. And, fourth, project benefits must be equitably shared, not only between the public and private sectors but also between local communities and national governments.[506]

This article placed the IMF towards the leading edge of public international institutions recognizing and taking steps towards sustainable development in the mining industry.

Since December 2000, the IMF has continued to report on the role mining can play in sustainable development. In March 2014, the IMF reported on Andean region countries using the mining industry to support economic growth and reduce poverty.[507] The Andean countries Bolivia, Peru, Colombia and Ecuador all have seen increased gas and mineral exports in recent years, now making up 50-60% or more of national exports, and the revenues from these industries make up a 15-20% percent and growing share of each country's governmental revenue.[508] Furthermore, many of the mines are small-scale artisanal mine operations, not large multinational corporations, meaning revenues remain local and can help support the local and national economies while having greater incentive to respect and support the local community.[509]

[506] Kathryn McPhail, International Monetary Fund, "How Oil, Gas and Mining Projects Can Contribute to Development," 37:4 Finance and Development Magazine (December 2000) <http://www.imf.org/external/pubs/ft/fandd/2000/12/mcphail.htm> accessed 18 April 2015.
[507] International Monetary Fund, IMF Survey Magazine, "Natural Resources Can Play Key Role in Inclusive Growth," (26 March 2014) <http://www.imf.org/external/pubs/ft/survey/so/2014/car032414b.htm> accessed 18 April 2015.
[508] International Monetary Fund, IMF Survey Magazine, "Natural Resources Can Play Key Role in Inclusive Growth," (26 March 2014) <http://www.imf.org/external/pubs/ft/survey/so/2014/car032414b.htm> accessed 18 April 2015.
[509] International Monetary Fund, IMF Survey Magazine, "Natural Resources Can Play Key Role in Inclusive Growth," (26 March 2014) <http://www.imf.org/external/pubs/ft/survey/so/2014/car032414b.htm> accessed 18 April 2015.

The IMF also regularly reports on the many developed and developing countries using the mining industry to spur domestic stability and economic growth. For example, Australia used a mining investment boom, especially in coal and iron ore, to spur income growth and raise living standards as well as forge stronger ties with Asian markets.[510] The IMF also reports the African nation Guinea was facing 20% inflation, currency devaluation and contracting GDP in 2009 and 2010 under the ruling military regime.[511] However, after the country's first democratic elections in 2010, the newly elected government took over in January 2011 and implemented structural reforms, including tightening monetary controls, cutting the budget deficit, stabilizing the exchange markets and easing inflation, and also implementing a new mining code to develop the country's significant natural resources of iron, bauxite, diamonds and other minerals.[512] New mining revenues are allowing the country to fund efforts towards infrastructure and electricity development, poverty reduction and support for the agriculture sector providing income to a majority of the country's inhabitants.[513] New investment in

[510] Alison Stuart, International Monetary Fund, "A Turn to Asia," 51:2 Finance and Development Magazine (June 2014) <http://www.imf.org/external/pubs/ft/fandd/2014/06/stuart.htm> accessed 18 April 2015. The article notes decreasing mineral prices and resulting decreasing mining investment were affecting Australia's growth, and Australia moved towards a broader-based economy and less mining-dependent economic growth to sustain its economy in the medium and long term.

[511] International Monetary Fund, IMF Survey Magazine, "Policy Reforms, Mining Boom Power Guinea's Recovery" (6 April 2012) <http://www.imf.org/external/pubs/ft/survey/so/2012/car040612a.htm> accessed 18 April 2015.

[512] International Monetary Fund, IMF Survey Magazine, "Policy Reforms, Mining Boom Power Guinea's Recovery" (6 April 2012) <http://www.imf.org/external/pubs/ft/survey/so/2012/car040612a.htm> accessed 18 April 2015.

[513] International Monetary Fund, IMF Survey Magazine, "Policy Reforms, Mining Boom Power Guinea's Recovery" (6 April 2012) <http://www.imf.org/external/pubs/ft/survey/so/2012/car040612a.htm> accessed 18 April 2015. The IMF report notes that, based on Guinea's structural reforms and domestic improvements, the country may qualify for full debt relief (including the nearly $200 million IMF loan) under the Heavily Indebted Poor Countries initiative, which would allow more domestic funds to be spent on infrastructure development, health and education spending and poverty reduction rather than debt service. Guinea reportedly also plans on judiciary reforms and investment streamlining to improve the business climate. Guinea's progress slowed in 2012 during political unrest based on overdue parliamentary elections and a reduction in mining sector investment, although parliamentary elections

Guinea's mining sector may account for 40% of the country's GDP in the 2010s.[514] Guinea also became a member of and is currently in compliance with the Extractive Industries Transparency Initiative, discussed in detail in Chapter 6, including publishing details of its mining contracts.[515]

The IMF has done more than simply report on the important role mining can play in economic and sustainable development, it has undertaken education, technical assistance and other direct work on the topic. In August 2014, the IMF, in conjunction with the World Bank, published a handbook for countries to develop and implement policies for revenues from the mining and extractive industry sectors. The "Administering Fiscal Regimes for Extractive Industries" handbook focuses attention on and provides guidance to resource-rich countries for effectively administering revenues from the natural gas, petroleum, and mineral resource industries.[516] The IMF notes that large influxes of extractive industry taxes or revenue pose problems for governments, including corruption and good governance challenges, and these problems may be exacerbated by the terms of contractual agreements or state participation in the

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were finally held in 2013, then a massive Ebola outbreak rocked the country and the region. Guinea is presently recovering from the Ebola outbreak and resulting economic slowdown, in a two steps forward one step back manner that should eventually lead to greater economic stability and prosperity. One benefit of mining projects is their long-term nature, allowing the promise of long-term stability.

[514] International Monetary Fund, IMF Survey Magazine, "Policy Reforms, Mining Boom Power Guinea's Recovery" (6 April 2012) <http://www.imf.org/external/pubs/ft/survey/so/2012/car040612a.htm> accessed 18 April 2015.

[515] United States Central Intelligence Agency, "The World Factbook: Guinea" (10 April 2015) <https://www.cia.gov/library/publications/the-world-factbook/geos/gv.html> accessed 18 April 2015. The report states: "In 2014 Guinea complied with requirements of the Extractive Industries Transparency Initiative by publishing its mining contracts. International investors have shown interest in Guinea's unexplored mineral reserves, which have the potential to propel Guinea's future growth."

[516] International Monetary Fund, IMF Survey Magazine, "Good Administration of Oil and Mining Revenues is Vital" (6 August 2014) <http://www.imf.org/external/pubs/ft/survey/so/2014/bok080614a.htm> accessed 18 April 2015.

industry.[517] The Handbook also addresses tax or other revenue collection[518] which is also a major concern because collection is key to the country's use of revenues towards goals such as poverty reduction, health and education spending, and infrastructure development, all of which play a role in sustainable development.

International Finance Corporation and Private Financing by the World Bank Group

The International Finance Corporation is the private financing arm of the World Bank Group, providing and arranging private financing for private business development in developing countries.[519] Although the IFC typically works directly with private enterprise, the IFC maintains lending requirements and performance standards that help promote sustainable development in general at the country level. For example, the IFC's environmental and social governance performance standards apply to businesses obtaining IFC financial support, and include eight performance standards areas such as environmental and social impact assessment, working conditions, resource efficiency, indigenous peoples considerations and cultural heritage protection.[520] These performance standards, which began in 1998, have been modified over time to incorporate environmental conservation and social development, the most recent standards having been adopted in 2012 as part of the IFC's revised Sustainability

[517] International Monetary Fund, IMF Survey Magazine, "Good Administration of Oil and Mining Revenues is Vital," (6 August 2014) <http://www.imf.org/external/pubs/ft/survey/so/2014/bok080614a.htm> accessed 18 April 2015.
[518] International Monetary Fund, IMF Survey Magazine, "Good Administration of Oil and Mining Revenues is Vital," (6 August 2014) <http://www.imf.org/external/pubs/ft/survey/so/2014/bok080614a.htm> accessed 18 April 2015.
[519] International Finance Corporation, Overview <http://www.ifc.org/wps/wcm/connect/CORP_EXT_Content/IFC_External_Corporate_Site/Solutions/Products+and+Services> accessed 1 August 2017.
[520] International Finance Corporation, Performance Standards <http://www.ifc.org/wps/wcm/connect/115482804a0255db96fbffd1a5d13d27/PS_English_2012_Full-Document.pdf?MOD=AJPERES> accessed 1 August 2017.

Framework.[521] Notably, the IFC has performance goals specific to the oil, gas and mining industry, including risk mitigation through adoption of IFC's performance goals (adopted and required by commercial banks as the "Equator Principles," discussed below), assisting private business with environmental and social management capacity, requiring publication of natural resource extraction payments (Extractive Industries Transparency Initiative or EITI, discussed in chapter 6), and promoting local community development and local supplier sourcing.[522]

Despite lofty statements, the IFC has come under heavy criticism for failing to effectuate environmental protection or social development. The Bretton Woods Project, a private watchdog over the World Bank Group and IMF, has heavily criticized the IFC for being profit-focused corporate welfare instead of fulfilling its mission of poverty eradication and development.[523] Oxfam International wrote in 2015 that IFC's private lending facilities allowed billions of dollars to be distributed without checks and balances and funding widespread human rights abuses.[524]

Ultimately, however, the IFC relies upon the World Bank to support governments in sustainable development programs, technical assistance and enforcement.

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[521] International Finance Corporation, Performance Standards <http://www.ifc.org/wps/wcm/connect/115482804a0255db96fbffd1a5d13d27/PS_English_2012_Full-Document.pdf?MOD=AJPERES> accessed 1 August 2017.

[522] International Finance Corporation, Oil, Gas and Mining Priorities <http://www.ifc.org/wps/wcm/connect/industry_ext_content/ifc_external_corporate_site/ogm+home/priorities> accessed 1 August 2017.

[523] Bretton Woods Project, "IFC investments rarely touch the poor," (12 February 2013). <http://www.brettonwoodsproject.org/2013/02/art-572001/> accessed 1 August 2017.

[524] Oxfam International, "Billions in 'out of control' IFC investments into third-parties causing human rights abuses around the world," (2 April 2015). <https://www.oxfam.org/en/pressroom/pressreleases/2015-04-02/billions-out-control-ifc-investments-third-parties-causing-human-rights-abuses> accessed 1 August 2017.

World Bank: A Brief Overview

The International Bank for Reconstruction and Development and the International Development Association, together called the "World Bank," provide and facilitate loans and other financial support as well as technical assistance to developing and least developed countries for domestic investment in areas such as infrastructure, health and education, agriculture, and resource management.[525] The World Bank's present-day mandate is to alleviate global poverty and promote shared inclusive growth by 2030, essentially adopting two of the United Nations' 2015 Sustainable Development Goals.[526] Like the IMF, the World Bank's actions towards these goals come from three main areas of work: (1) economic data collection, analysis and dissemination, (2) technical assistance and policy advice, and (3) financial lending.[527]

The World Bank's data program includes collection of data on national, regional and global statistics as well as development indicators and provides the data in open format on its website.[528] Available data exists for economics and many hundreds of development-related topics, ranging from agriculture (arable land to cereal yield) and environment (threatened species to carbon emissions), to poverty (rural and urban poverty gaps to income held by lowest 10%) and aid effectiveness (life expectancy to net flows from UN agencies).[529] Available data includes a topic for energy and mining, but

[525] World Bank Group <http://www.worldbank.org/en/about/what-we-do> accessed 25 April 2015. The World Bank also plays a major role in compiling and making data available the world economy and development.
[526] World Bank Group <http://www.worldbank.org/en/about/what-we-do> accessed 14 February 2016.
[527] World Bank Group <http://www.worldbank.org/en/about/what-we-do> accessed 14 February 2016.
[528] World Bank Group – Data <http://data.worldbank.org/> accessed 14 February 2016.
[529] World Bank Group – Data <http://data.worldbank.org/> accessed 14 February 2016.

the existing data sets do not include non-fuel mining data, nor does non-fuel mining data appear elsewhere in the available data sets.

For training purposes, the World Bank and World Bank Institute make experts available and host online talks and courses on hundreds of specific topics, from agriculture technology to early childhood development and financing to meet the 2015 Sustainable Development Goals.[530] The World Bank, in cooperation with the Columbia Center on Sustainable Development and Natural Resource Governance Institute with the Sustainable Development Solutions Network, recently started a free 12-week online course specific to extractive industries titled "Natural Resources for Sustainable Development: The Fundamentals of Oil, Gas and Mining Governance."[531] The World Bank also coordinates the Global Development Learning Network, which partners with local academic, government, NGO and other institutions in most major cities in the world to provide targeted training on topics of need.[532] Recent topics include women's business enterprises in Tanzania, pediatric cardiac surgeon training in Vietnam, and climate change information.[533] Many training programs are conducted via hosted videoconference or online, making regional and global access possible.

The World Bank also provides technical assistance for countries and project-related technical assistance. In recent years, "[t]rade-related technical assistance has expanded considerably in the World Bank, with the appointment of trade coordinators in each of the six regional departments of the Bank to ensure a strategic approach to

[530] World Bank Group – Open Learning Campus <https://olc.worldbank.org/> accessed 14 February 2016.
[531] World Bank Group – Open Learning Campus <https://olc.worldbank.org/content/getting-most-out-our-natural-resources> accessed 14 February 2016.
[532] Global Development Learning Network <http://gdln.org/about> accessed 14 February 2016.
[533] Global Development Learning Network <http://gdln.org/about> accessed 14 February 2016.

capacity building" and institution building.[534] Additionally, the World Bank's Trade Facilitation Initiative has "tools to help improve the quality of operations and disseminate best practices across the different regions, and has increased staffing in critical areas such as customs, port management and shipping security," and includes an "outreach programme designed to help developing countries approach the negotiations with the tools needed to make informed decisions."[535] The Trade Facilitation Initiative was recently bolstered by adoption in February 2017 of the WTO's Trade Facilitation Agreement (TFA) and the related Trade Facilitation Support Program (TFSP), initially working towards transparency in developing countries and predictability in cross-border trade.[536] As a new agreement, its efficacy will only be judged over time.

The World Bank's lending activities are both country- and project-specific. Taking one least-developed and natural resource rich country, Madagascar, as example, the IBRD has loaned the country $32.8 million, while the IDA has extended over $3 billion in credits and $128 million in grants, for total lending/credit of over $4 billion.[537] Of this total, $250 million has been canceled, $175 million is undisbursed, over $2.2 billion has been repaid, and over $1.4 billion remains outstanding.[538] World Bank

[534] Marc Auboin, WTO Secretariat, "WTO Discussion Paper No. 13: Fulfilling the Marrakesh Mandate on Coherence: Ten Years of Cooperation Between the WTO, IMF and World Bank" (2007) <https://www.wto.org/english/res_e/booksp_e/discussion_papers13_e.pdf> accessed 7 February 2016.
[535] Marc Auboin, WTO Secretariat, "WTO Discussion Paper No. 13: Fulfilling the Marrakesh Mandate on Coherence: Ten Years of Cooperation Between the WTO, IMF and World Bank" (2007) <https://www.wto.org/english/res_e/booksp_e/discussion_papers13_e.pdf> accessed 7 February 2016.
[536] Anabel Gonzalez, World Bank, The Trade Post blog, "Now that the Trade Facilitation Agreement has entered into force…" 22 February 2017 <http://blogs.worldbank.org/trade/now-trade-facilitation-agreement-has-entered-force> accessed 1 August 2017.
[537] World Bank Group – Projects & Operations http://web.worldbank.org/WBSITE/EXTERNAL/PROJECTS/0,,pagePK:64392398~piPK:64392037~theSitePK:40941~countrycode:MG~menuPK:64820000,00.html accessed 14 February 2016.
[538] World Bank Group – Projects & Operations http://web.worldbank.org/WBSITE/EXTERNAL/PROJECTS/0,,pagePK:64392398~piPK:64392037~theSitePK:40941~countrycode:MG~menuPK:64820000,00.html accessed 14 February 2016.

funded projects in Madagascar include mining projects, port development, HIV/AIDS prevention, irrigation development, national parks, social safety net improvements for the extremely poor, health education and similar development and poverty-eradication projects.[539]

World Bank Efforts for Sustainable Development and Towards the Mining Industry

Like the IMF, the World Bank recognizes the role the mining sector holds in the global economy, and the role mining can play in sustainable development. The World Bank has regularly identified the mining sector as a potential source of sustainable economic development. A 2011 World Bank working paper identified the mining industry as a source for increased domestic tax revenues, employment opportunities, technology transfer and infrastructure development especially in rural areas, noting the World Bank has funded 39 mining projects in 24 countries in the past three decades.[540] The same paper also identified risks associated with mining industry growth absent effective policies and enforcement, including socio-economic degradation and environmental damage, and the World Bank's current focus on small- and large-scale mining project funding incorporating environmental protection and good governance requirements.[541] Similarly, the World Bank has hosted training programs on women in

[539] World Bank Group – Projects & Operations http://web.worldbank.org/WBSITE/EXTERNAL/PROJECTS/0,,pagePK:64392398~piPK:64392037~theSitePK:40941~countrycode:MG~menuPK:64820000,00.html accessed 14 February 2016.
[540] World Bank, "Working Paper: Mining: World Bank support to mining sector reform" (2011) <http://documents.worldbank.org/curated/en/2011/09/16283816/mining-world-bank-support-mining-sector-reform> accessed 14 February 2016.
[541] World Bank, "Working Paper: Mining: World Bank support to mining sector reform" (2011) <http://documents.worldbank.org/curated/en/2011/09/16283816/mining-world-bank-support-mining-sector-reform> accessed 14 February 2016.

mining, including 2004 in Poland,[542] and has provided briefing on women in mining elsewhere including Tanzania.[543] Furthermore, the World Bank has undertaken specific research to identify risks posed to mining industry financing by sustainable development requirements and how sustainable development can be better incorporated into the financing structures.[544]

Specifically, the World Bank funds projects to facilitate growth in the mining sector in developing countries. In doing so, the World Bank now takes into account environmental and social development concerns, and incorporates requirements to address these concerns in its funding and technical assistance projects.[545] For example, the World Bank recognizes that "mining may cause environmental issues ranging from waste rock and tailing disposal, land disturbance, dust and noise, to water use and pollution. If not managed well, any of these could adversely affect the health and livelihood of the poor and vulnerable groups living near mining operations."[546] For this reason, all projects financed by the World Bank must now adhere to strict social and

[542] World Bank, "Proceedings: Women in mining conference" (2004) <http://documents.worldbank.org/curated/en/2004/06/18556271/women-mining-poland-june-8-2004-conference-overview> accessed 14 February 2016.
[543] World Bank, "Africa Region findings: Tanzania: women in the mining sector," (Washington, DC: paper no. 189. 2001), available at http://documents.worldbank.org/curated/en/2001/08/1561413/tanzania-women-mining-sector (accessed on 14 Feb 2016).
[544] World Bank, "Working Paper: Finance, mining and sustainability (2013) <http://documents.worldbank.org/curated/en/2013/01/18537799/finance-mining-sustainability> accessed 14 February 2016. The report was a joint project of the World Bank, United Nations Environment Programme and the Mining Minerals and Sustainable Development Project (MMSD).
[545] The World Bank's Operational Manual contains detailed operations requirements for World Bank projects including requirements for environmental assessment, indigenous peoples protection and water resource management. World Bank Operational Manual <http://web.worldbank.org/WBSITE/EXTERNAL/PROJECTS/EXTPOLICIES/EXTOPMANUAL/0,,menuPK:64142516~pagePK:64141681~piPK:64141745~theSitePK:502184,00.html> accessed 23 August 2015.
[546] World Bank, Oil, Gas and Mining Unit, Mining & Environment <http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTOGMC/0,,contentMDK:20220969~menuPK:509406~pagePK:148956~piPK:216618~theSitePK:336930,00.html> accessed 25 April 2015.

environmental guidelines.[547] More recent World Bank efforts in the mining sector have focused on social development and poverty eradication, including local economic development as well as support for small-scale and artisanal mining projects.[548] The World Bank states that: "with appropriate local economic development (LED) instruments, … mining companies and other local stakeholders (local government, education institutions, other businesses) can work together to ensure that the local population, including the poorest segments, can benefit from the presence of new investments and share in the growth potential of the local economy."[549]

The World Bank has an Oil, Gas and Mining Unit as well as a Mining Governance and Growth Support Project. The Oil, Gas and Mining Unit has provided technical assistance to 41 mining sector reform projects in 24 countries since 1988.[550] The Mining Unit recognizes the following challenge to a developing country's mining industry:

> Many countries view the mining sector as a key engine of economic development. Ample evidence exists that countries that adopt modern mining legislation and offer an enabling environment can attract private

[547] World Bank, Oil, Gas and Mining Unit, Mining & Environment <http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTOGMC/0,,contentMDK:20220969~menuPK:509406~pagePK:148956~piPK:216618~theSitePK:336930,00.html> accessed 25 April 2015. The World Bank did not always take environmental or sustainability needs into account in project funding, this is a change in the last two to three decades.

[548] World Bank, Oil, Gas and Mining Unit, Mining and Local Economic Development <http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTOGMC/0,,contentMDK:20220981~menuPK:509410~pagePK:148956~piPK:216618~theSitePK:336930,00.html> accessed 25 April 2015.

[549] World Bank, Oil, Gas and Mining Unit, Mining and Local Economic Development <http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTOGMC/0,,contentMDK:20220981~menuPK:509410~pagePK:148956~piPK:216618~theSitePK:336930,00.html> accessed 25 April 2015.

[550] World Bank, Mining Results <http://www.worldbank.org/en/results/2013/04/14/mining-results-profile> accessed 25 April 2015. The World Bank notes that its approach has evolved over time, initially it began with governance and good mining laws, then included environmental protections, and more recently the World Bank has begun to include mining community and regional development protections including the impact on women and disadvantaged groups. Very recent efforts have focused on artisanal and small-scale mining support as a means of improving local economies.

> sector investment in mining exploration and production. This, in turn, contributes to increased tax revenues, export earnings, employment opportunities, infrastructure development especially in rural areas, and transfer of technology to the host countries. However, while the extraction of mineral resources provides developing countries with considerable opportunities for economic development, there is the risk that mining operations can turn into socio-economic enclaves or cause environmental damage. Attention to social and environmental considerations and government commitment to good governance and transparency is important.[551]

The Oil, Gas and Mining Unit's work has included technical assistance to Tanzania in adopting a new mining law and increasing royalties, technical assistance to Argentina to improve governance over foreign mining investment that grew from $56 million (USD) to $2.4 billion (USD) between 1995 and 2008, and technical assistance to Madagascar to develop large ilmenite (titanium source) and nickel/cobalt mines in relatively poor and biodiverse areas of the country.[552] The World Bank also contributes financial support to mining projects, as of December 2012 supporting 12 projects with a total of $364 million (USD) in financial commitments, 70% of which is dedicated to projects in Africa.[553] The World Bank's focus on investment in Africa, with many less developed countries, highlights its commitment to sustainable development.

The World Bank's Mining Governance and Growth Support Project assists with funding for improvements in domestic mining management. For example, the Project in March 2011 approved a $25 million (USD) credit and facilitated an additional over $5

[551] World Bank, Mining Results <http://www.worldbank.org/en/results/2013/04/14/mining-results-profile> accessed 25 April 2015. It should be noted that, although the World Bank's work is focused on developing countries, these concerns apply equally to mining in developed countries as well.
[552] World Bank, Mining Results <http://www.worldbank.org/en/results/2013/04/14/mining-results-profile> accessed 25 April 2015. The Unit also worked with Mongolia, a strong and growing mining country, towards its compliance with the Extractive Industries Transparency Initiative membership requirements.
[553] World Bank, Mining Results <http://www.worldbank.org/en/results/2013/04/14/mining-results-profile> accessed 25 April 2015.

million (USD) in European Union funding for the Malawi government to improve management and governance in its small but growing mining sector.[554] Malawi's mining sector includes the Kayelekera Uranium Mine, opened in 2009, as well as growing interest by mining companies in developing rare earths, nickel, niobium, bauxite and coal resources in Malawi.[555] The World Bank funds will be used to improve efficiency, transparency and sustainability, including environmental and social best practices, in Malawi's growing mining sector, which Malawi anticipates in the long term will go from 2% to 10% of the country's GDP.[556]

In addition to its own funding efforts, the World Bank facilitates adoption of the Extractive Industry Transparency Initiative (EITI) in developing and developed countries through its administration of Multi-Donor Trust Fund funds used for this purpose.[557] The World Bank reports that in Nigeria alone, a $230 million (USD) discrepancy

[554] World Bank, Press Release, "World Bank to Support Good Governance in Malawi's Emerging Mining Sector, (31 March 2011) <http://www.worldbank.org/en/news/press-release/2011/03/31/world-bank-to-support-good-governance-in-malawis-emerging-mining-sector> accessed 25 April 2015.
[555] World Bank, Press Release, "World Bank to Support Good Governance in Malawi's Emerging Mining Sector, (31 March 2011) <http://www.worldbank.org/en/news/press-release/2011/03/31/world-bank-to-support-good-governance-in-malawis-emerging-mining-sector> accessed 25 April 2015. Based on their chemical properties, rare earths and radioactives such as uranium often are co-located, and Malawi is suspected to have some of Africa's largest rare earths deposits based on its known large uranium deposits.
[556] World Bank, Press Release, "World Bank to Support Good Governance in Malawi's Emerging Mining Sector, (31 March 2011) <http://www.worldbank.org/en/news/press-release/2011/03/31/world-bank-to-support-good-governance-in-malawis-emerging-mining-sector> accessed 25 April 2015. Malawi has recently been hindered by a scandal involving stolen public funds, new elections have taken place, and the government continues to have legitimacy challenges, but a new Mining Law is being negotiated that may assist towards Malawi's and the World Bank's efforts in expanding the domestic mining industry. Falling commodity prices during the global economic slowdown also have had a negative impact.
[557] World Bank <http://www.worldbank.org/en/results/2013/04/15/extractive-industries-transparency-initiative-results-profile> accessed 23 August 2015.

reduction between extractive industry payments made and government revenue receipts reported.[558]

The World Bank Group also produces an annual Extractive Industries Review describing the World Bank's activities relating to extractive industries, including oil, gas and mining.[559] For 2012, the World Bank Group's total lending to extractive industries was just under $700 million, including $85 million from the World Bank (IBRD and IDA) for capacity building and policy support, and another $400 million in private financing by the International Finance Corporation (IFC).[560] The World Bank Group's 2012 report estimates private oil, gas and mining companies supported in part by the IFC contributed $6.2 billion to government revenues, provided $100 million in community support spending, created over 100,000 jobs, and the same companies spent over $5 billion on local and national goods and services.[561] The World Bank Group also highlights several programs and initiatives in the oil, gas and mining sector that it supports, including the Extractive Industries Transparency Initiative (EITI), an Extractive Industries Technical Advisory Facility supporting advisory services to

[558] World Bank <http://www.worldbank.org/en/results/2013/04/15/extractive-industries-transparency-initiative-results-profile> accessed 23 August 2015.
[559] World Bank Group Oil, Gas and Mining Unit, Extractive Industries Review Reports <http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTOGMC/0,,contentMDK:20306686~menuPK:336936~pagePK:148956~piPK:216618~theSitePK:336930,00.html> accessed 16 February 2016.
[560] World Bank Group, World Bank Group in Extractive Industries - 2012 Annuals Review (2012) <http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2013/05/22/000445729_20130522190042/Rendered/PDF/778660AR0WBG0E00Box377313B00PUBLIC0.pdf> accessed 16 February 2016. The International Finance Corporation is a private lending entity within the World Bank Group, lending to private entities in developing countries.
[561] World Bank Group, World Bank Group in Extractive Industries - 2012 Annuals Review (2012) <http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2013/05/22/000445729_20130522190042/Rendered/PDF/778660AR0WBG0E00Box377313B00PUBLIC0.pdf> accessed 16 February 2016. The report also notes that beginning in 2012, the IFC required the principal contracts for oil, gas and mining projects it funded to be made public, a further transparency initiative, although long overdue.

countries needing rapid assistance on extractive industry projects, and the World Bank Institute hosts a Governance for Extractive Industries collaborative program for various stakeholders to work towards good governance.[562] The World Bank Group also created a Sustainable Community Development Facility to provide funding and advising for oil, gas and mining companies to create and manage community development programs as part of the IFC-funded project, and included a website for best practices for this work which has become a widely popular clearinghouse for large-project community development practices, expanding to agriculture and other economic sectors.[563] The World Bank Group also published an online, open source Extractive Industries Source Book with sample legal and policy and regulatory framework documents and related publications and best practices guides.[564]

Not everything the World Bank Group does in the oil, gas and mining sector comes up roses, however. One analysis of the impact of World Bank's new extractive industries lending requirements and guidelines in two Mali mines finds:

> The regulatory frameworks proposed by the World Bank have provided companies and developing countries with a measuring rod for evaluating mining operations. However, recourse to self-assessment by the companies themselves (even if this is followed by a review of the results by the IFC) raises the problem of the application and enforcement of these norms. The current approach masks the real difficulty, which is created

[562] World Bank Group, World Bank Group in Extractive Industries - 2012 Annuals Review (2012) <http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2013/05/22/000445729_20130522190042/Rendered/PDF/778660AR0WBG0E00Box377313B00PUBLIC0.pdf> accessed 16 February 2016.
[563] World Bank Group, World Bank Group in Extractive Industries - 2012 Annuals Review (2012) <http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2013/05/22/000445729_20130522190042/Rendered/PDF/778660AR0WBG0E00Box377313B00PUBLIC0.pdf> accessed 16 February 2016.
[564] World Bank Group, World Bank Group in Extractive Industries - 2012 Annuals Review (2012) <http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2013/05/22/000445729_20130522190042/Rendered/PDF/778660AR0WBG0E00Box377313B00PUBLIC0.pdf> accessed 16 February 2016.

> by the weakness of resources within national institutions that have the role of ensuring that the rules of operation in this sector are in fact respected. The lack of acknowledgement of the importance of the role of national institutions in the implementation of regulatory framework proposed by the EIR is reflected in the concurrent promotion of reform policies weakening these same institutions.[565]

The World Bank has made strides towards incorporating sustainable development goals in its project funding. However, the World Bank has been rightfully criticized for failing to ensure compliance with these sustainable development goals at the project level. One major, publicly acknowledged failure is in resettlement assurance. The World Bank and its borrowers are supposed to ensure people physically or economically displaced by a project are provided resettlement assistance equal to or better than before.[566] But World Bank president Jim Yong Kim publicly admitted the World Bank has done a miserable job at determining when resettlement is needed due to World Bank projects, and an even worse job at ensuring resettlement is properly accomplished including for indigenous and vulnerable populations.[567] The Guardian reported in March 2015 that the World Bank has now admitted "it had no idea how many people may have been forced off their land or lost their jobs due to its projects," and "also did not know whether these people were compensated fairly, on time or at all."[568] An internal review of 59 World Bank projects

[565] Gisèle Belem, "Mining, Poverty Reduction, and the Protection of the Environment and the Role of the World Bank Group in Mali," in Bonnie Campbell (ed.) *Mining in Africa: Regulation and Development* (Pluto Press 2009) 119-149.
[566] Sasha Chavkin, Michael Hudson and Ben Hallman, International Consortium of Investigative Journalists, "As World Bank Admits Failures, Safeguards Questions Remain" (5 March 2015) <http://www.icij.org/blog/2015/03/world-bank-admits-failures-safeguards-questions-remain> accessed 23 August 2015.
[567] Ryan Schlief, International Accountability Project, "World Bank President Admits Resettlement Failures: 'What We Found Causes Me Deep Concern,'" The Guardian (9 March 2015) <http://www.theguardian.com/global-development-professionals-network/2015/mar/09/world-bank-president-jim-yong-kim-resettlement-land-rights> accessed 23 August 2015.
[568] Ryan Schlief, International Accountability Project, "World Bank President Admits Resettlement Failures: 'What We Found Causes Me Deep Concern,'" The Guardian (9 March 2015) <http://www.theguardian.com/global-development-professionals-network/2015/mar/09/world-bank-president-jim-yong-kim-resettlement-land-rights> accessed 23 August 2015.

in which resettlement needs were expected revealed 61% of the projects failed to collect information to determine whether resettlement was accomplished, where the people went, or whether compensation was paid.[569]

The World Bank also has been criticized for failing to be more proactive in the realm of contract negotiations between national or local governments and mining companies. As the World Trade Organization has noted, "multilateral institutions like the World Bank must work with industry groups, environmental NGOS, and others to set common standards for dealing with the environment and rights of indigenous people, and to fund capacity-building for official enforcement and civil society monitoring."[570] The World Bank also has failed to take a definitive role in contract negotiations or re-negotiations between national governments and foreign direct investors such as mining companies.[571] As one commentator writing for the WTO noted, "It is now becoming clear that the mantra that contract negotiations should be regarded as private undertakings between international corporations and host governments whereas enforcing the contracts is a public good is not sustainable."[572]

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[569] Ryan Schlief, International Accountability Project, "World Bank President Admits Resettlement Failures: 'What We Found Causes Me Deep Concern,'" The Guardian (9 March 2015) <http://www.theguardian.com/global-development-professionals-network/2015/mar/09/world-bank-president-jim-yong-kim-resettlement-land-rights> accessed 23 August 2015.

[570] Theodore H. Moran, World Trade Organization, "Is FDI in Natural Resources a "Curse"? (2010) <https://www.wto.org/english/res_e/publications_e/wtr10_forum_e/wtr10_moran_e.htm> accessed 22 August 2015.

[571] Mary Kimani, Africa Renewal Online, "Mining to Profit Africa's People" (April 2009) <http://www.un.org/africarenewal/magazine/april-2009/mining-profit-africa%E2%80%99s-people> accessed 23 August 2015. This well-written article discusses many of the ongoing sustainable development issues for mining in sub-Saharan Africa, including renegotiating mining contracts to eliminate provisions allowing mining companies to avoid environmental and social protection laws, increased civil society participation, increased transparency, avoiding bad post-war contracts, and improved planning to use mining revenues towards sustainable development.

[572] Theodore H. Moran, World Trade Organization, "Is FDI in Natural Resources a "Curse"? (2010) <https://www.wto.org/english/res_e/publications_e/wtr10_forum_e/wtr10_moran_e.htm> accessed 22

Furthermore, the World Bank has altered its fundamental focus for extractive industry projects over time in a manner that is both confusing and challenging for adopting best practices. The World Bank made it very clear in its 1992 study *A Strategy for African Mining* that the role of government was to create a suitable environment for the private sector. This required "[a] clearly articulated mining sector policy that emphasises the role of the private sector as owner and operator and of government as regulator and promoter." Governments of developing countries slowly adapted to this *laissez faire* private industry focus, in part believing private industry and market forces will solve developing country problems, but then the World Bank (appropriately) shifted more focus towards poverty reduction and sustainable development in 2001 in accordance with the Millennium Development Goals and after its Extractive Industries Review in 2003. Partial government interest in mining activities, such as through partial share ownership or joint ventures, is now at least not actively discouraged, and stronger national government role in requiring sustainable development goals is part of the World Bank's Operational Manual. These shifts in focus require significant efforts by developing countries that often lack resources or political will and stability to navigate the World Bank changes. It would be helpful for the World Bank to at least publicly acknowledge these shifts and the challenges developing countries face in meeting them, and even more helpful for the World Bank to possibly admit past errors in focus.

The World Bank also has to recognize that many projects have mixed financing, such as private financing, regional development bank financing, and World Bank financing or support. Private and IFC-supported financing often comes with application

August 2015. Moran cites as example the attempts by newly-elected Liberian President Ellen Johnson Sirleaf at renegotiating a contract with Mittal Steel Holdings. Liberia is now a member of the EITI.

of the Equator Principles, which is a "risk management framework, adopted by financial institutions, for determining, assessing and managing environmental and social risk in projects … primarily intended to provide a minimum standard for due diligence to support responsible risk decision-making."[573] The Equator Principles are voluntary environmental and human rights principles adopted by international banks for projects valued over $10 million (USD), and are applied to approximately 80% of project financings.[574] In this manner, the voluntary nature of the principles and the large finance threshold the principles apply to means significant private loans and lending institutions do not apply the principles, even voluntarily. The Equator Principles also are implemented by different banks in different ways, and enforcement mechanisms and pathways are presently unclear.[575] Additionally, regional development banks and the World Bank have standards and reporting requirements for sustainable development that differ and occasionally conflict, but with stronger enforcement mechanisms.[576] For instance, the Inter-American Development Bank has required environmental and human rights protections in loan agreements, and has made loan default a consequence of failure to comply with these protections.[577]

[573] International Finance Corporation, Equator Principles <http://www.equator-principles.com/> accessed 16 February 2016. The Equator Principles are now on version three, "EP3."
[574] International Finance Corporation, Equator Principles <http://www.equator-principles.com/> accessed 16 February 2016.
[575] Michael Likovsky, "Contracting and regulatory issues in the oil and gas and metallic minerals industries," in United Nations Conference on Trade and Development, Transnational Corporations 18:1 (April 2009) <http://unctad.org/en/Docs/diaeiia20097_en.pdf> accessed 27 January 2016.
[576] Michael Likovsky, "Contracting and regulatory issues in the oil and gas and metallic minerals industries," in United Nations Conference on Trade and Development, Transnational Corporations 18:1 (April 2009) <http://unctad.org/en/Docs/diaeiia20097_en.pdf> accessed 27 January 2016.
[577] Michael Likovsky, "Contracting and regulatory issues in the oil and gas and metallic minerals industries," in United Nations Conference on Trade and Development, Transnational Corporations 18:1 (April 2009) <http://unctad.org/en/Docs/diaeiia20097_en.pdf> accessed 27 January 2016. The author notes that, with respect to the Camisea gas pipeline project in Peru, NGOs targeted private bank financing and the Inter-American Development Bank with NGO pressure to decline financing based on

Another word must also be said regarding the "natural resource curse." As noted in chapter two, the "natural resource curse" discussion in the early 2000s caused a stir in academic and industry circles. In 2001, Sachs and Warner found an association between natural resource abundance and lower than expected national growth rates in developing countries, providing examples including Congo and Angola,[578] which is now largely accepted as truth without verification.[579] However, according to Sachs and Warner's own paper, the difference between negative and positive outcomes appears to lie principally in the existence of appropriate domestic legislation and enforcement efforts, including transparency of foreign direct investment at the domestic level, corruption prevention, and environmental protection standards and enforcement.[580] Notably, these

environmental and human rights concerns, possibly causing some loss of private bank financing for the project and contributing to the American member of the Inter-American Development Bank abstention from voting on the project. It should be noted that financing ultimately was secured, possibly at slightly higher project expense, potentially meaning less profits were available for distribution. This may be an example of NGOs working to kill projects as opposed to working with parties involved in the project towards sustainable development goals.

[578] Jeffrey D. Sachs and Andrew M. Warner, "Natural resources and economic development: the curse of natural resources," European Economic Review 45 (2001) 827-838.

[579] Scott Pegg, "Mining and poverty reduction: Transforming rhetoric into reality," Journal of Cleaner Production 14:3-4 (2006) 376-387 <http://www.sciencedirect.com/science/article/pii/S0959652605000697> accessed 27 January 2016. The author incorrectly cites a 2002 World Bank study, "Treasure or trouble: mining in developing countries," <http://siteresources.worldbank.org/INTOGMC/Resources/treasureortrouble.pdf> accessed 27 January 2016. The author states the World Bank study shows that for developing countries mining natural resources, "mining is more likely to lead to poverty exacerbation than it is to poverty reduction." However, the actual World Bank study concluded, as shown in the Sachs and Warner article, that "First, in more cases than not, mining countries appear to fare better than other countries in their respective regions. Second, where they do fare well, their good performance appears to be associated mostly with institutional stability and overall good economic management, particularly that relating to the management of revenues from the mining sector and the management of the sector itself. Third, the need to build institutional stability and improve economic management is most urgent in countries where the mining sector dominates an economy and where poor economic management and weak institutions are persistent features."

[580] Jeffrey D. Sachs and Andrew M. Warner, "Natural resources and economic development: the curse of natural resources," European Economic Review 45 (2001) 827-838; Theodore H. Moran, World Trade Organization, "Is FDI in Natural Resources a "Curse"? (2010). <https://www.wto.org/english/res_e/publications_e/wtr10_forum_e/wtr10_moran_e.htm> accessed 22 August 2015.

same input factors are part of standard sustainable development programs. In other words, if sustainable development efforts are put forth in developing countries with available natural resources, the sustainable development efforts will actually help ensure stronger national growth and development.

The problems experienced by the World Bank are perhaps compounded by disagreement in the international community regarding the best practices for sustainable development efforts by the mining industry. For example, several NGOs promote the concept that mining revenues should remain local for local and indigenous sustainable development.[581] But others urge caution, noting "contemporary evidence from the allocation of revenues directly to local authorities reveals that the latter have weak planning capability, little experience with tenders and contracts, and a tendency to adopt short-sighted expenditures on football stadiums and other popular undertakings beset by corruption even more pervasive than at the national level."[582] In some situations, national centralized budgeting for local improvements is more likely to yield local benefits.[583]

The World Bank established an Inspection Panel beginning in 1993 to allow for investigation of complaints regarding adverse effects from World Bank funded

[581] Natural Resource Governance Institute, Grant Project, "Convert Mining Revenues Into Local Development in Cameroon" <http://www.resourcegovernance.org/fr/grants/convert-mining-royalties-local-development-cameroon> accessed 23 August 2015. Information regarding the grant project notes that the Cameroon national mining law requires 25% of ad valorem tax revenues from mining go to local councils and communities but does not specify what the local councils and communities do with these revenues, and local living conditions did not improve even with the mining revenues.

[582] Theodore H. Moran, World Trade Organization, "Is FDI in Natural Resources a "Curse"? (2010) <https://www.wto.org/english/res_e/publications_e/wtr10_forum_e/wtr10_moran_e.htm> accessed 22 August 2015.

[583] Theodore H. Moran, World Trade Organization, "Is FDI in Natural Resources a "Curse"? (2010) <https://www.wto.org/english/res_e/publications_e/wtr10_forum_e/wtr10_moran_e.htm> accessed 22 August 2015.Moran states: "Perhaps a better model can be found in Chile's centralized budget allocations directed to roads and schools in mining regions that has resulted in measurably superior poverty reduction in Antofagasta."

projects.[584] Other World Bank Group entities have similar inspectors, including the IFC and MIGA's Compliance Advisor Ombudsman, an office intended to address community-based complaints regarding IFC/MIGA funded projects.[585] The World Bank's Inspection Panel is "an impartial fact-finding body, independent from the World Bank management and staff," reporting directly to the World Bank's executive board.[586] The three Inspection Panel members serve non-renewable five-year terms, ensuring entrenchment does not occur, but also eliminating some institutional memory. The Inspection Panel itself recognizes some of its shortcomings, including lack of access to the complaint system by affected community members, challenges investigating projects to determine whether and how complaints can be resolved, lack of follow-up with affected community members, and possible retaliation against complaining community members.[587] The Inspection Panel also notes continuing non-compliance in certain areas, including indigenous peoples' rights, cultural property protection and involuntary resettlement,[588] all areas highlighted by NGOs as serious problems for World Bank funded projects as well.

[584] World Bank Inspection Panel <http://ewebapps.worldbank.org/apps/ip/Pages/AboutUs.aspx> accessed 16 February 2016. The Inspection Panel is not specific to oil, gas and mining projects, but applies to all World Bank funded projects.
[585] IFC/MIGA Compliance Advisor Ombudsman, <http://www.cao-ombudsman.org/> accessed 1 August 2017.
[586] World Bank Inspection Panel <http://ewebapps.worldbank.org/apps/ip/Pages/AboutUs.aspx> accessed 16 February 2016.
[587] World Bank Inspection Panel, "The Inspection Panel at Fifteen Years" (2009) <http://ewebapps.worldbank.org/apps/ip/IPPublications/InspectionPanelAt15yearsEnglish.pdf> accessed 16 February 2016.
[588] World Bank Inspection Panel, "The Inspection Panel at Fifteen Years" (2009) <http://ewebapps.worldbank.org/apps/ip/IPPublications/InspectionPanelAt15yearsEnglish.pdf> accessed 16 February 2016.

Strengths and Challenges for the IMF and World Bank Towards Sustainable Development

The IMF and World Bank have been providing funding and technical assistance for years in support of development in and through the mining industry. Along the way, the institutions have been encouraging or requiring national governments to adopt at least some environmental protection and sustainable development measures, and more recently social development and poverty eradication strategies. "One of the main areas of cooperation between the WTO, the World Bank and the IMF in the recent period is the Aid-for-Trade initiative, aimed at helping developing countries, in particular LDCs, to build the supply-side capacity and trade related infrastructure they need to assist them to implement and benefit from WTO agreements, and to expand their trade."[589] The World Bank is also a key partner in the Extractive Industries Transparency Initiative, making EITI membership increasingly a recognized standard for countries with mining activity.

Additionally, the IMF and World Bank work is done at the domestic and even local level, dove-tailing with industry private efforts as well as domestic and local efforts towards sustainable development, including in the mining industry. This reinforces the likelihood that local and domestic efforts towards sustainable development in the mining industry are a proper focus for the cooperative efforts of public international institutions in this area.

[589] Marc Auboin, WTO Secretariat, "WTO Discussion Paper No. 13: Fulfilling the Marrakesh Mandate on Coherence: Ten Years of Cooperation Between the WTO, IMF and World Bank" (2007) <https://www.wto.org/english/res_e/booksp_e/discussion_papers13_e.pdf> accessed 7 February 2016.

However, implementation and enforcement of sustainable development goals and requirements need improvement, especially in the mining industry. As discussed above, the IMF wrote extensively back in 2000 that the mining industry can make a significant contribution towards sustainable development at the domestic level. But the fifteen years between 2000 and 2015 has seen little progress in incorporating sustainable development principles as part of IMF lending activities. At a Jakarta natural resources conference for the Asia-Pacific region held in August 2015, ninety senior government officials from resource-rich Asia-Pacific countries gathered to speak about the same issues raised in 2000, "how to structure and administer a fiscal regime for extractive industries that… allows governments to retain a reasonable share of revenues (for social development) while at the same time remaining attractive to private investors?"[590] Officials at the conference discussed experiences with oil/gas and mining industry revenues, transparency, Mongolia's experience as an EITI member country, and the challenge of attracting private extractive industry investment while ensuring domestic revenues.[591] For example, international financiers such as Dutch development bank FMO have been criticized for doing little more than public criticism in the face of the murders of environmental activists in Honduras.[592] These comments and lack of progress show both the IMF and World Bank could work more closely with international financiers of development projects to ensure those financiers respect and protect human rights and

[590] Alpa Shah and Peter Mullins, International Monetary Fund, IMF Survey Magazine, "Asia-Pacific: Feeling the Ping from Lower Commodity Prices" (23 September 2015).
[591] Alpa Shah and Peter Mullins, International Monetary Fund, IMF Survey Magazine, "Asia-Pacific: Feeling the Ping from Lower Commodity Prices" (23 September 2015).
[592] Zeid Ra'ad Al Hussein, "Development banks need to wake up to the human rights crisis in Honduras" The Guardian (20 March 2016).

promote sustainable development, and the IFC's role could be strengthened in this regard as well.

The lack of global adoption of sustainable development requirements in mining can hardly be laid entirely at the IMF's or World Bank's feet, of course. The 2015 Jakarta conference also highlighted the ongoing general tension for countries to have low enough barriers to entry and investment requirements to attract private investment while simultaneously having sufficient domestic laws and rules to achieve broad sustainable development goals. This tension is heightened in the mining industry, as mining carries high initial investment and start-up costs, such that very low barriers to entry to open new mining ventures may appear necessary to attract private mining investment. Ideally, all countries would have the same or very similar sustainable development laws and rules for mining, but such international cooperation and agreement is highly unlikely. Even if uniformity of sustainable development laws and rules for mining were possible, uniformity in enforcement is also highly unlikely, as countries vie for limited private mining investment funds. Private mining investment funds have nearly vanished in the mid-2010s with the crash in mining product prices, although slow recovery is expected over the next decade.

More broadly, the lack of structural and other reforms *within* developing countries to allow for sustainable development likewise cannot be laid at the feet of the IMF and World Bank. The IMF works closely with developing and least-developed countries to provide concessional credit facilities as part of a program for reform and development, but this does not guarantee government reform. For example, the Republic of Armenia's 2015 Letter of Intent with the IMF provides for continued financial support

and a standby arrangement as part of a broad reform program that includes tax policy reforms, a new tax code, improved tax and customs administration, and increased social spending including road construction and schools, and pension system reform.[593] The Republic of Armenia notes that part of the reason certain fiscal targets were missed related to a large $65 million loan (0.6% of GDP) directly from the government to support development of a new copper mine in a depressed region of the country, a loan made instead of leveraging public-private investment or similar private finance facilities.[594] The IMF has been criticized for not requiring legal and structural reforms in developing countries prior to lending, and not withdrawing loan funds if the countries do not meet established goals and targets.[595] On the contrary, and to its credit, the IMF continues to work with Armenia, Ebola-stricken Liberia,[596] and other countries towards meeting reform goals and targets as part of continued financial support, when other entities may be tempted to remove financial support due to lack of progress to the short- and long-term detriment of the country and its sustainable development efforts.

To its further credit, the IMF has embraced the United Nations' 2015 Sustainable Development Goals. The IMF noted in 2015, "[w]ith its focus on macroeconomic criticality and its global membership, the IMF can work directly with its member

[593] International Monetary Fund, Republic of Armenia Letter of Intent and Technical Memorandum of Understanding to the International Monetary Fund (22 October 2015) <www.imf.org> accessed 13 February 2016.
[594] International Monetary Fund, Republic of Armenia Letter of Intent and Technical Memorandum of Understanding to the International Monetary Fund (October 22, 2015) <www.imf.org> accessed 13 February 2016.
[595] Global Exchange, "Top Ten Reasons to Oppose the IMF" <http://www.globalexchange.org/resources/wbimf/oppose> accessed 13 February 2016. Several of the criticisms relate to IMF practices in the 1980s and 1990s, which admittedly focused on debt repayment rather than development, leading to many national defaults. These practices appear to have changed since that time.
[596] The IMF restructured and canceled some debt of three Ebola-stricken countries.

countries and help to ensure a supportive, enabling global environment for sustainable development… through: (1) economic diversification and structural transformation within a stable macroeconomic framework; (2) economic, gender, and financial inclusion; and (3) climate and environmental sustainability."[597] Specifically, the IMF highlights the importance of economic diversification and structural transformation in developing countries, reduction of inequality for developing and high-income countries, and environmental sustainability.[598] Economic diversification is especially important in resource-dependent developing countries as commodity prices are highly variable and a diversified economy can better absorb commodity price variations, allowing for continued growth in social development and environmental protection. However, the IMF's letters of intent and other lending documentation from 2015 to the present do not reflect any focus on or incorporation of these sustainable development goals. It may be that the IMF will slowly incorporate sustainable development goals, including equality and environmental protection, in its lending practices, but this has not been evidenced to date.[599]

Likewise, the World Bank has embraced the 2015 Sustainable Development Goals, indeed the World Bank's goal of poverty eradication was in place before the United Nations' adoption of the 2015 Sustainable Development Goals. The World Bank

[597] Stefania Fabrizio, Rodrigo Garcia-Verdu et al., International Monetary Fund staff, IMF Staff Discussion Note, "From Ambition to Execution: Policies in Support of Sustainable Development Goals," SDN/15/18 (September 2015). The comprehensive, well-written article contains detailed assessments of the challenges to sustainable development achievement as well specific goals and targets for their achievement.

[598] Stefania Fabrizio, Rodrigo Garcia-Verdu et al., International Monetary Fund staff, IMF Staff Discussion Note, "From Ambition to Execution: Policies in Support of Sustainable Development Goals," SDN/15/18 (September 2015).

[599] Mohammed Mossallem, Bretton Woods Project, "The IMF in the Arab World: Lessons Unlearnt" (November 2015) <http://www.eurodad.org/files/pdf/56b075f5395dd.pdf> accessed 12 February 2016. The author is critical of the IMF's slow change.

also has incorporated inclusive growth as a second goal of the institution. Furthermore, the World Bank has incorporated sustainable development goals into its training/education programs and increasingly incorporates some sustainable development goals as part of its lending/credit programs.

The World Bank's project funding work is regularly criticized by NGOs for deleterious social and environmental results. The World Bank's support of mining activity in Madagascar is one example of this tension. The World Bank reports its Madagascar mining project funding as a success:

> IDA has supported mining sector reform in Madagascar through a series of technical assistance projects since 1998, with emphasis on attracting investment, improving the sector's environmental performance, and ensuring that the sector's benefits are widespread. The reforms fostered a large increase in activity, including the development of large mining operations in ilmenite and nickel/cobalt. Given the country's widespread poverty, the government undertook a strategy centered on strengthening local governance, decentralizing fiscal revenues, and providing technical assistance to community associations and municipal governments for the integration of mineral resources management in their development plans. Two investment agreements totaling $5.5 billion were signed in the mining sector in 2005-06. Approximately 12,000 domestic jobs were created during construction of the two mines… Mine forestry committees have been established to assist with biodiversity and land use planning. Both mining companies have provided extensive short-term training and some long-term training for workers that will help provide local communities with a source of income beyond mine closure. Both companies have taken proactive stances in enabling local small and medium enterprises to take advantage of business opportunities arising during construction and exploitation. [Two ports were developed and upgraded and] both operations provide power to their local areas. An additional objective was to establish a foundation in connection with the ilmenite mine that would provide local communities with a source of income far beyond mine closure.[600]

[600] World Bank, "Working Paper: Mining: World Bank support to mining sector reform" (2011) <http://documents.worldbank.org/curated/en/2011/09/16283816/mining-world-bank-support-mining-sector-reform> accessed 14 February 2016.

However, this same project drew severe criticism from environmental NGOs for promoting mining and development in an environmentally sensitive and unique location.[601]

Another frequent NGO criticism of IMF and World Bank lending practices are that they impose western and wealthy country values and requirements on developing countries, as a form of pseudo-colonialism. The IMF and World Bank do need to be sure it is working with developing countries and incorporating good practices such as taxation policy and good governance in cooperation with the countries and not imposing inappropriate or unrealistic expectations, and generally speaking they do so (absent leadership or regime change).[602] The NGOs must also keep in mind that, while the IMF and World Bank were appropriately criticized for lending requirements contributing to 1980s and 1990s country loan defaults, essentially some of the same NGOs want enforceable sustainable development goals and requirements through global lending. NGOs must recognize this is a double standard, and that developing countries may resist sustainable development requirements in lending in the same manner and for the same reasons as NGOs criticize the IMF and World Bank. Ultimately, the IMF and World Bank should work with developing and least-developed countries to incorporate desirable and achievable domestic legal and structural reforms to support development, recognizing that carbon-neutrality or other environmental goals are neither priorities nor attainable in the short term.

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[601] Alison Benjamin, "Madagascar mine threatening biodiversity," The Guardian (24 October 2007). The article cites extensive criticism by Friends of the Earth.

[602] Criticism on this point has come from, among others, William Easterly, *The White Man's Burden* (Penguin Publishing 2006) and Joseph E. Stiglitz, "Democratizing the International Monetary Fund and World Bank: Governance and Accountability," Governance: An International Journal of Policy, Administration and Institutions 16:1 (January 2003) 111-139.

Both the IMF and the World Bank provide important technical assistance to developing countries, often working together and with other institutions such as the WTO and UNCTAD to do so. This cross-institutional cooperation is both important and effective, and should be expanded.

In short, it is commendable that the IMF and World Bank recognize the development potential that mining offers to developing and least-developed countries. Both institutions also are working with the mining sector and making efforts towards developing country natural resource projects with development and sustainability in mind. These are the types of cooperative activities that other public international institutions can and should be undertaking.

If the primary public international institutions discussed in the preceding chapters have vast room for improvement, it bears considering what efforts the mining industry and NGOs are making towards sustainable development, and whether public international institutional support is necessary at all.

Chapter Six

Mining Industry and NGO Efforts Towards Sustainable Development: Reluctance, Distrust and Some Positive Developments

Introduction

This chapter seeks to answer the question whether the mining industry, either alone or with non-governmental organization (NGO) actors, sufficiently promotes sustainable development such that the work of public international institutions is not necessary.

Chapter two generally described the mining processes and markets for copper and rare earths. This chapter discusses the mining industry's and NGO private efforts towards sustainable development,[603] analyzing the shortcomings of these efforts and pitfalls in relying upon private efforts towards sustainable development. The chapter concludes by determining, for various reasons, that the mining industry and NGOs are not sufficiently promoting sustainable development and there remains an important role to play for public international institutions.

Private International Sustainable Development Efforts

There is no doubt that, generally speaking, mining and all other multinational corporations have certain obligations, such as to avoid human rights abuses or complicity with state actors in human rights abuses, and violations of these obligations may cause a corporation to lose its "social license to operate"[604] if not lose its actual domestic

[603] Academia has, in fits and starts, played a minor role in mining and sustainable development efforts, and therefore is not discussed in this thesis.

[604] John Morrison, The Guardian, "Business and society: defining the 'social licence'," (29 September 2014). Morrison refers to the social license as commercial activity enjoying general trust and legitimacy and carried out with the consent of those affected including stakeholder and rights-holder consent, providing examples of the loss of social license by Shell in the Niger Delta and BP in the Gulf of Mexico. Morrison notes the social license cannot be entirely controlled by business.

operations in the state where violations of these obligations occur.[605] While sustainable development principles and goals require much more of multinational corporations, these sustainable development expectations are only just beginning to see adoption in the multinational corporation context.

There are no known international organizations for the rare earths mining sector, and certainly none focusing on sustainable development in the sector. Even in the more established copper sector, few private international organizations bring together copper stakeholders in any fashion. The International Copper Study Group, an intergovernmental organization based in Lisbon, has two dozen member countries sharing statistical information relating to the copper industry.[606] The ICSG aims to promote copper industry transparency as well as provide a common forum for industry and governments to address issues relating to copper production and consumption.[607] Interestingly, while the ICSG acknowledges "the main current issues of interest include the international economy, sustainable development, energy, the environment, and trade," ICSG's recent work has been "on topics including refined copper usage and the world economy, production and trade of semifabricate copper and copper alloy products, secondary copper production, and copper price volatility."[608] Thus, there seems to be a

[605] John Ruggie, "Protect, Respect and Remedy: A Framework for Business and Human Rights," Report to the Human Rights Council by the Special Representative of the Secretary-General on the issue of Human Rights and Transnational Corporations and other Business Enterprises, United Nations Doc. A/HRC/8/5 (2008). Ruggie reports that these corporate social responsibilities are not only negative (i.e. "do no harm") but also positive in nature, such that multinational corporations are expected to undertake positive steps towards rights protections in order to retain a social or actual legal license to operate.
[606] International Copper Study Group <http://www.icsg.org/index.php/who-we-are/members-&-observers> accessed 28 February 2015.
[607] International Copper Study Group <http://www.icsg.org> accessed 28 February 2015.
[608] International Copper Study Group <http://www.icsg.org> accessed 28 February 2015.

disconnect between the issues facing the industry and the issues the industry is presently willing to address.

For the mining industry generally at the international level, relatively few organizations exist specific to the mining industry and either corporate social responsibility[609] or sustainable development within the industry.[610] This is due in large part to the high capital requirements involved in mining, leading to the existence currently of a few nationalized mining companies and a few massive mining companies dominating the sector, such as Rio Tinto, BHP Billiton and Anglo American. Smaller mining prospecting and small-scale operations private and public companies exist, but often focus efforts on exploration and or small mineral deposits only, often selling out to major mining companies for the larger mine operation itself.[611] Other small mining companies operate only at a local or national level, such as small-scale and artisanal mining operations. These smaller mining companies fly under the radar of international attention. Some trade groups exist, such as the U.S.-based National Mining Association, Mining Association of Canada, and the Global Mining Association of China, but these organizations are limited in scope and nationality. Rarer still are private international organizations working towards sustainable development in the mining industry.

[609] This thesis addresses sustainable development in particular, which can be an aspect of corporate social responsibility, but overall corporate social responsibility is beyond the scope of this thesis.
[610] Several international institutions have developed general business standards or goals for human rights recognition, including the International Finance Corporation's Performance Standards, United Nations Global Compact, OECD Guidelines for Multinational Companies, Voluntary Principles for Security and Human Rights, and United Nations Guiding Principles on Business and Human Rights. The Global Reporting Initiative is also a well-known and widely adopted sustainability accountability mechanism but still only captures perhaps a few hundred multinational corporations.
[611] Keith Jefferis, United Nations Committee on Trade and Development, "The role of TNCs in the extractive industry of Botswana," Transnational Corporations (April 2009) 68-69 <http://unctad.org/en/Docs/diaeiia20097a3_en.pdf> accessed 26 January 2016.

Large public mining companies have engaged in numerous voluntary efforts towards improving human rights and sustainable development goals. For example, nearly 30 international mining and oil companies have adopted the Voluntary Principles on Security and Human Rights as of 2016.[612] The Voluntary Principles were established in 2000 through private industry, NGOs as well as the governments of the US and UK, as a "set of principles designed to guide companies in maintaining the safety and security of their operations within an operating framework that encourages respect for human rights."[613] The Voluntary Principles largely focus on corporate respect for human rights in conflict zones and other security-challenged regions. Although some aspects of human rights are involved in sustainable development, these Voluntary Principles do not directly address sustainable development but instead focus on security issues.

Geneva-based World Economic Forum is an international organization with over 1,000 major corporate members working towards improving the state of the world and its people through good corporate citizenship and public-private initiatives.[614] The World Economic Forum is perhaps best known for its annual meetings in Davos, Switzerland. The Forum also hosts a mining and metals sector, with 24 major mining company members, working towards responsible mining and mineral development.[615] The World Economic Forum secured the white paper on mining and the SDGs sponsored in part by

[612] Voluntary Principles on Security and Human Rights <http://www.voluntaryprinciples.org/> accessed 27 January 2016. Extractive industries are more likely than other commercial concerns to have operations in security-challenged regions, making extractive industry adoption of the Voluntary Principles both more crucial and somewhat more likely (companies not operating in security-challenged regions would not be targeted for or need to adopt the Voluntary Principles).
[613] Voluntary Principles on Security and Human Rights <http://www.voluntaryprinciples.org/> accessed 27 January 2016.
[614] World Economic Forum <www.weforum.org> accessed 28 February 2015.
[615] World Economic Forum <http://www.weforum.org/industry-partners/groups/mm-mining-metals#ipartners> accessed 28 February 2015.

the UNDP, discussed in chapter three. Additional current initiatives of the mining and metals sector within the World Economic Forum include increasing knowledge towards responsible mineral development and sustainable development in the mining and minerals sector.[616] Increasing knowledge seems a relatively modest goal, however given the divide between mining companies and various environmental and other non-governmental organizations, dialogue and understanding is likely the first order of business. A report following the mining and metals sector meeting in 2014 noted:

> Non-governmental organizations (NGOs) are active and influential in the mining and metals sector. Conflicts between mining companies and local communities are increasing, as is the deep, persistent mistrust between communities, government and the industry… NGO actions include fighting against corruption, increasing transparency, eliminating human-rights violations and reducing poverty. Although the mining and metals sector is committed to the same causes, the two groups clearly are not collaborating effectively… Mining companies, particularly large ones, tend to dedicate resources for the development and protection of the society, environment and economy of the regions in which they operate. However, NGOs expect mining companies to do still more, as problems persist in mining communities. Both sides fundamentally disagree on the extent of companies' responsibility for resolving social and environmental issues, especially in regions where governments lack the necessary resources.[617]

Separate from the World Economic Forum, in late 1998, several large mining company CEOs,[618] meeting in London, initiated a dialogue and ultimately a project with

[616] World Economic Forum <http://www.weforum.org/industry-partners/groups/mm-mining-metals#ipartners> accessed 28 February 2015.
[617] World Economic Forum Report, "Mining & Metals Governors Meeting 2014" <http://www.weforum.org/industry-partners/groups/mm-mining-metals#ipartners> accessed 28 February 2015.
[618] International Institute for Environment and Development, "Breaking New Ground: The Report of the Mining, Minerals and Sustainable Development Project" (May 2002) 412 <www.iied.org/mmsd> accessed 29 November 2014. Nine mining companies began the process, and the numbers grew to 25 major mining companies and a total of 40 commercial and non-commercial sponsors by the time the Final Report was issued, including major mining companies such as Alcan Inc., Alcoa Inc., Anglo American PLC, BHP Billiton, Gold Fields LLC, Mitsubishi Corporation, Mitsui Mining & Smelting Co., Ltd., Nippon Mining & Metals Co., Ltd., and Rio Tinto PLC. No rare earth metals mining companies were sponsors of the project.

the International Institute for Environment and Development (IIED) to analyze the industry's practices and determine the industry's role in a sustainable development era.[619] This effort, called the Global Mining Initiative, was based on recognition that the "future of the mining and metals industries is inseparable from the global pursuit of Sustainable Development."[620] The authors of the Global Mining Initiative recognized that critics saw the industry as a relic of the industrial age and its dependence on non-renewable resources fundamentally incompatible with sustainable development.[621] Importantly, the industry's poor reputation with respect to sustainable development was recognized to have caused or contributed to the mining industry's increased problems with access to land for exploration and access to markets for products, and resulting problems with access to capital.[622] The keynote address on the Global Mining Initiative was delivered to the Mining 2000 Conference on September 20, 2000 at Melbourne, Australia, the de facto capital of the mining industry. George Littlewood, a consultant for WMC Resources Ltd., in cooperation with Tony Wells of BHP Minerals, reported to conference attendees the history of the Global Mining Initiative to date, the role of the

[619] George Littlewood, Global Mining Initiative Address, Mining 2000, Melbourne, Australia (September 20, 2000) 2 <www.icmm.com/document/104> accessed 27 December 2014. Recognizing that an industry-led sustainable development project would be met with great skepticism, the mining industry CEOs consulted with Richard Sandbrook, co-founder of Friends of the Earth and then-executive director of London-based IIED. Sandbrook and the IIED created a proposal for the mining industry review and sustainable development program, to be overseen and peer reviewed by the respected World Business Council for Sustainable Development (WBCSD) as a third-party not specifically affiliated with the mining industry.

[620] George Littlewood, Global Mining Initiative Address, Mining 2000, Melbourne, Australia (September 20, 2000) 2 <www.icmm.com/document/104> accessed 27 December 2014.

[621] George Littlewood, Global Mining Initiative Address, Mining 2000, Melbourne, Australia (September 20, 2000) 2 <www.icmm.com/document/104> accessed 27 December 2014.

[622] George Littlewood, Global Mining Initiative Address, Mining 2000, Melbourne, Australia (September 20, 2000) 2 <www.icmm.com/document/104> accessed 27 December 2014; Dr. John Groom, Safety and Sustainable Development Adviser at Anglo American, quoted in International Institute for Environment and Development, Discussion Paper, "MMSD+10: Reflecting on a decade of mining and sustainable development," (2012) 7 <www.iied.org/mmsd> accessed 6 December 2014.

World Business Council for Sustainable Development (WBCSD) as project overseer,[623] the role of the IIED as project coordinator, and the long list of mining companies signed up to support the project, including 20 major mining companies participating in the project to that date representing every major commodity and mining region in the world.[624]

Working through WBCSD, the mining companies contracted with IIED to study the industry and develop a voluntary sustainable development program for the mining industry. The IIED also worked with the Mining and Energy Research Network experts to review the proposed program, which was finalized in May 2002 as the "Mining, Minerals & Sustainable Development" program (MMSD).[625] The Final MMSD Report succinctly states both the promise and problems with the mined minerals industry: "Mineral products are essential to contemporary societies and economies... The process of producing, using, and recycling minerals could help society reach many other goals – providing jobs directly and indirectly, aiding in the development of national economies, and helping to reach energy and resource efficiency targets, among many others. Where industry is falling far short of meeting these objectives, it is seen as failing in its obligations and is increasingly unwelcome… [but] [t]he mining and minerals industry …

[623] The World Business Council for Sustainable Development is a global, CEO-led organization with CEOs from over 200 companies working to accelerate business transition towards sustainability in all industries, including mining, <www.wbcsd.org> accessed 1 August 2017. Executive committee members include China Petrochemical and Royal Dutch Shell, and member companies include major mining companies such as ArcelorMittal and 3M. The WBCSD works to gather, share and expand sustainable development knowledge from and with company partners.

[624] George Littlewood, Global Mining Initiative Address, Mining 2000, Melbourne, Australia (September 20, 2000) 2 <www.icmm.com/document/104> accessed 27 December 2014.

[625] International Institute for Environment and Development, "Breaking New Ground: The Report of the Mining, Minerals and Sustainable Development Project" (May 2002) <www.iied.org/mmsd> accessed 15 November 2014. The report was created in view of, and completed just before, the World Summit on Sustainable Development in Rio de Janeiro, Brazil.

is currently distrusted by many of the people it deals with day to day. It has been failing to convince some of its constituents and stakeholders that it has the 'social licence to operate' in many parts of the world."[626]

The Final MMSD Report also defines the sustainable development goal for the mined minerals industry, stating "the goal should be to maximize the contribution to the well-being of the current generation in a way that ensures an equitable distribution of its costs and benefits, without reducing the potential for future generations to meet their own needs."[627] The Report identified several key challenges for the mining industry to address sustainable development goals and objectives, including the need for the industry to be financially viable, land use management challenges, local and national corruption, protection and improvement of local mine communities, mine waste management, recycling mined materials, and local and national governance that supports and promotes sustainable development.[628] Interestingly, one major recommendation in the Final Report was to adopt a Declaration on Sustainable Development and supporting protocols for companies to adopt to simplify the multiple codes of conduct and sources of guidance among various mining industry groups and NGOs.[629] This recommendation highlights

[626] International Institute for Environment and Development, "Breaking New Ground: The Report of the Mining, Minerals and Sustainable Development Project" (May 2002) xiv <www.iied.org/mmsd> accessed 15 November 2014.
[627] International Institute for Environment and Development, "Breaking New Ground: The Report of the Mining, Minerals and Sustainable Development Project" (May 2002) xvi <www.iied.org/mmsd> accessed 15 November 2014.
[628] International Institute for Environment and Development, "Breaking New Ground: The Report of the Mining, Minerals and Sustainable Development Project" (May 2002) xvii-xviii <www.iied.org/mmsd> accessed 15 November 2014.
[629] International Institute for Environment and Development, "Breaking New Ground: The Report of the Mining, Minerals and Sustainable Development Project" (May 2002) xxvii <www.iied.org/mmsd> accessed 15 November 2014.

the problem that even with private industry and other non-governmental groups there are many uncoordinated proposals and programs towards sustainable development.

In 2012, ten years after its original MMSD report, the IIED evaluated the mined minerals industry's progress towards the established sustainable development goals, preparing a MMSD+10 progress report.[630] The IIED found, in sum, that "the past 10 years have seen a valuable increase in the number of standards and best practice guidance, helping stakeholders to understand what sustainable development means…[b]ut despite good intentions at the strategy level and examples of good practice, the complexity of situations at the mine site means implementation across the sector is highly variable."[631] The mining industry and industry trade groups have made progress in adopting best practices and guidelines for sustainable development in the mining industry, but implementation of these practices on the ground has been sporadic at best.[632] But, the MMSD+10 Paper concludes, "[s]ocial issues are better understood by mining companies than they were 10 years ago but environmental issues, with their technical solutions, remain easier to address. The complexity of operations – whether because of the size of the mine or the social and environmental context – means that despite improvements in organizational policies and systems, substantial improvements

[630] International Institute for Environment and Development, Discussion Paper, "MMSD+10: Reflecting on a decade of mining and sustainable development" (2012) <www.iied.org/mmsd> accessed 29 November 2014.
[631] International Institute for Environment and Development, Discussion Paper, "MMSD+10: Reflecting on a decade of mining and sustainable development" (2012) 2 <www.iied.org/mmsd> accessed 29 November 2014.
[632] International Institute for Environment and Development, Discussion Paper, "MMSD+10: Reflecting on a decade of mining and sustainable development" (2012) 2 <www.iied.org/mmsd> accessed 29 November 2014.

in capacity are still needed."[633] Sector-specific best practices and guidelines could assist with this issue, such as specific guidelines for diamond, gold, iron ore, copper and other mining industry segments.[634] The OECD Guidelines for Multinational Enterprises provide some guidance on company due diligence processes in conflict-affected and high-risk areas, principally for gold, tin, tantalum and tungsten ("3TG"), with the goal of reducing available funding for armed conflict and increase respect for human rights, but its scope is limited, observance is voluntary and unenforceable, and company adherence rates are unreported.[635] More comprehensive, sector-specific best practices and guidelines, preferably with compliance reporting or enforcement mechanisms, are much preferred.

Adding an additional challenge, the rise of mining industries in China, India and other developing countries has altered the global mining industry, in some ways re-setting the clock on work towards sustainable development in mining. The IIED is doing more research into mining and sustainable development, including further work on the ability of mining to contribute to sustainable development, and studying the role of small-scale and artisanal mining in developing countries in promoting sustainable

[633] International Institute for Environment and Development, Discussion Paper, "MMSD+10: Reflecting on a decade of mining and sustainable development" (2012) 12 <www.iied.org/mmsd> accessed 29 November 2014.
[634] Adisa Azapagic, "Developing a framework for sustainable development indicators for the mining and minerals industry," Journal of Cleaner Production 12:6 (August 2004) 639-662 <http://www.sciencedirect.com/science/article/pii/S0959652603000751> accessed 27 January 2016; Gavin Hilson and Arun J. Basu, "Devising indicators of sustainable development for the mining and minerals industry: An analysis of critical background issues," International Journal of Sustainable Development & World Ecology 10:4 (2003) 319-331 <http://www.tandfonline.com/doi/abs/10.1080/13504500309470108> accessed 27 January 2016.
[635] Organization for Economic Co-operation and Development (OECD) Guidelines for Multinational Enterprises, Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas (Revised 2016), <http://www.oecd.org/corporate/mne/mining.htm> accessed 1 August 2017.

livelihoods.[636] IIED also recently participated in a forum co-sponsored by the International Council on Mining and Metals (ICMM) and the Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development during the latter's annual meeting, focusing on collaborative development between industry, government and civil society.[637]

One area of success the IIED points to in its MMSD+10 report is the International Council on Mining and Metals' (ICMM) implementation of many recommendations for the mining industry. The ICMM is a voluntary CEO-led mining industry group, with 21 major mining company members,[638] and was created in 2001 to represent the world's major private mining and metals companies "to advance their commitment to sustainable development."[639] The ICMM was an outgrowth of the Global Mining Initiative and the MMSD project, "when the global mining firms accepted at the highest level that their sector was facing significant problems in reputation, sustaining profits, access to new assets and maintaining investor and employee

[636] Abbi Buxton, International Institute for Environment and Development, "Responding to the Challenge of Artisanal and Small-Scale Mining" (5 March 2013) <http://www.iied.org/iied-shines-light-small-scale-mining> accessed 15 November 2014.
[637] International Council on Mining and Metals, News Release, "Mining's Contribution to Sustainable Development at the Core of Intergovernmental Forum" (28 October 2014) <http://www.icmm.com/news-and-events/news/minings-contribution-to-sustainable-development-at-the-core-of-intergovernmental-forum> accessed 10 January 2015.
[638] ICMM's mining company members include African Rainbow Minerals, AngloAmerican, AngloGold Ashanti, Antofagasta Minerals, Areva, Barrick, BHP Billiton, Codelco, Glencore, Freeport-McMoRan, Goldcorp, Gold Fields, Hydro, JX Nippon Mining & Metals, Lonmin, Mitsubishi Materials, Newmont, Polyus Gold, Rio Tinto, South32, Sumitomo Metal Mining, and Teck. International Council on Mining and Metals Council <http://www.icmm.com/about-us/our-council> accessed 22 August 2015. Antofagasta and Glencore just became ICMM members in 2014, indicating industry interest in ICMM membership is growing.
[639] International Council on Mining and Metals <http://www.icmm.com/about-us/our-history> accessed 22 August 2015.

confidence."[640] The ICMM was tasked with taking the MMSD recommendations to the mining industry towards adoption and implementation. The IIED Final Report in 2002 recommended the industry coalesce around one Declaration on Sustainable Development with supporting protocols, and specifically suggested the industry use the ICMM's Sustainable Development Charter as a starting point.[641] Towards this end, the ICMM developed a *Sustainable Development Framework*, including ten key principles such as ethical business practices, upholding basic human rights and cultural respect, science-based risk management, improved health and safety and environmental performance, biodiversity conservation, recycling, and transparency.[642] Of particular note, the ten sustainable development principles are *binding* on member companies, including required annual reporting as well as third party assurance based on Global Reporting Initiative standards, creating a rare accountability and enforcement tool within an NGO,

[640] International Council on Mining and Metals <http://www.icmm.com/about-us/our-history> accessed 22 August 2015.

[641] International Institute for Environment and Development, "Breaking New Ground: The Report of the Mining, Minerals and Sustainable Development Project" (May 2002) xxvii <www.iied.org/mmsd> accessed 15 November 2014.

[642] International Council on Mining and Metals Ten Principles <http://www.icmm.com/our-work/sustainable-development-framework/10-principles> accessed 22 August 2015. ICMM's ten principles are a conglomeration of sustainable development principles from the Rio Declaration, Global Reporting Initiative, Global Compact, OECD Guidelines on Multinational Enterprises, World Bank Operational Guidelines, OECD Convention on Combating Bribery, select ILO Conventions (98, 169 and 176), and the Voluntary Principles on Security and Human Rights. The ten principles are: (1) Implement and maintain ethical business practices and sound systems of corporate governance, (2) Integrate sustainable development considerations within the corporate decision-making process, (3) Uphold fundamental human rights and respect cultures, customs and values in dealings with employees and others who are affected by our activities, (4) Implement risk management strategies based on valid data and sound science, (5) Seek continual improvement of our health and safety performance, (6) Seek continual improvement of our environmental performance, (7) Contribute to conservation of biodiversity and integrated approaches to land use planning, (8) Facilitate and encourage responsible product design, use, re-use, recycling and disposal of our products, (9) Contribute to the social, economic and institutional development of the communities in which we operate, and (10) Implement effective and transparent engagement, communication and independently verified reporting arrangements with our stakeholders.

a tool that most United Nations sponsored agencies lack.[643] Reporting is independently monitored and publicly reported on an annual basis, representing better reporting than most United Nations treaty bodies receive from states parties. Since the IIED's 2002 report, the ICMM has become the "port of call"[644] for sustainable development in the mining industry, including adoption of mandatory position statements on indigenous relations, climate change, mining in protected areas, and partnerships for development. One criticism of the ICMM's work is that the member companies are required to report and obtain third party assurances on their reporting, but there is no enforced requirement to actually make progress towards sustainable development goals, and there is no third party assurance process for actual progress.

Perhaps in response to the MMSD project, the Non-Ferrous Metals Consultative Forum on Sustainable Development, sponsored by the International Copper Study Group and International Lead and Zinc Study Group among others, created a Science and Research Study Group in April 2001. The purpose of the Science and Research Study Group was to improve communication among scientists, improve risk assessment techniques, and develop work on the life-cycles of various mined metals including recycling and re-use consistent with sustainable development.[645] The Non-Ferrous

[643] Heledd Jenkins and Natalia Yakovleva, "Corporate social responsibility in the mining industry: Exploring trends in social and environmental disclosure," Journal of Cleaner Production, 14:3-4 (2006) 271-284 <http://www.sciencedirect.com/science/article/pii/S0959652605000375> accessed 27 January 2016. The authors note that the mining industry was slow to adopt sustainability reporting in the 1990s, but then to its credit became a leading industry in such reporting, giving some credit to the Global Reporting Initiative for this positive development. The authors also note smaller and private companies do less or no reporting compared to larger and public companies.

[644] International Institute for Environment and Development, Discussion Paper, "MMSD+10: Reflecting on a decade of mining and sustainable development," (2012) 9 <www.iied.org/mmsd> accessed 6 December 2014.

[645] Non-Ferrous Metals Consultative Forum on Sustainable Development Working Group on Science, Research and Development information sheet <w3.cetem.gov.br/imaac> accessed 27 December 2014. The cited website, www.nfmcsd.org is no longer active.

Metals Consultative Forum on Sustainable Development appears to have dissolved since the early 2000s and no further work can be found. Similarly, the Mining and Energy Resource Network, referenced in the MMSD report, also appears to have dissolved and no ongoing work can be found.

Yet another group, the Initiative for Responsible Mining Assurance (IRMA), was formed in 2006 with an objective to create an independent third-party verified system for industrial mining standards meeting certain social and environmental objectives such as environmental protection, fair labor standards and human rights.[646] Advisors reportedly include representatives from NGOs, labor unions, mining-affected communities, end purchasers and mining companies, although government representatives do not appear to be involved and few mining companies appear to be involved.[647] The current goal for IRMA is to have standards in place by 2016, ten years after the group formed.[648] If successful, IRMA will also include consumer labeling ensuring purchasers of products such as wedding rings, computers, cars and building materials that socially and environmentally protective mining best practices have been used for the mined materials.[649] To its credit, and perhaps its demise, the first draft IRMA standard issued July 2014 includes an ambitious scope covering legal compliance and transparency, labor standards, workplace safety, human rights due diligence, community engagement and support including "free, prior and informed consent" (FPIC), cultural heritage

[646] Initiative for Responsible Mining Assurance website <http://www.responsiblemining.net/the-irma-process/faqs/> accessed 28 February 2015.
[647] Initiative for Responsible Mining Assurance website <http://www.responsiblemining.net/the-irma-process/faqs/> accessed 28 February 2015.
[648] Initiative for Responsible Mining Assurance website <http://www.responsiblemining.net/the-irma-process/faqs/> accessed 28 February 2015.
[649] Initiative for Responsible Mining Assurance website <http://www.responsiblemining.net/the-irma-process/faqs/> accessed 28 February 2015.

protection, water and air and noise quality, waste management, biodiversity protection, environmental and social impact assessments and monitoring, and a grievance and remedies system.[650] The group's work is ongoing but not yet widely accepted.

The Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development[651] arose out of a Global Dialogue initiative intended to help implement the plan arising from the 2002 World Summit on Sustainable Development in Johannesburg[652] as it relates to the mining, minerals and metals industries.[653] Fifty-four countries currently voluntarily participate in the forum, with a goal to improve and promote the contribution of the mining, minerals and metals sector to sustainable development and poverty reduction.[654] The group's work includes professional development and training courses, guidance for governments, but most importantly a Mining Policy Framework of governmental best practices required for good

[650] Initiative for Responsible Mining Assurance website <http://www.responsiblemining.net/the-irma-process/faqs/> accessed 28 February 2015.
[651] Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development <http://www.globaldialogue.info/wn_e.htm> accessed 28 February 2015.
[652] Report of the World Summit on Sustainable Development, 4 September 2002, A/CONF.199/20 ("Johannesburg Declaration"), Para. 46. Paragraph 46 of the Plan of Implementation seeks to: (a) Support efforts to address the environmental, economic, health and social impacts and benefits of mining, minerals and metals throughout their life cycle, including workers' health and safety, and use a range of partnerships, furthering existing activities at the national and international levels, among interested Governments, intergovernmental organizations, mining companies and workers, and other stakeholders, to promote transparency and accountability for sustainable mining and minerals development; (b) Enhance the participation of stakeholders, including local and indigenous communities and women, to play an active role in minerals, metals and mining development throughout the life cycles of mining operations, including after closure for rehabilitation purposes, in accordance with national regulations and taking into account significant transboundary impacts; and (c) Foster sustainable mining practices through the provision of financial, technical and capacity-building support to developing countries and countries with economies in transition for the mining and processing of minerals, including small-scale mining, and, where possible and appropriate, improve value-added processing, upgrade scientific and technological information, and reclaim and rehabilitate degraded sites.
[653] Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development <http://www.globaldialogue.info/wn_e.htm> accessed 28 February 2015.
[654] Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development <http://www.globaldialogue.info/wn_e.htm> accessed 28 February 2015. Notably, Australia, China and the United States are not members at present. The forum is hosted in Canada.

environmental, social and economic governance of the mining sector in a manner that will contribute to sustainable development.[655] The governmental best practices include legal and policy objectives, taxation and royalties systems, socio-economic goals, environmental protections, and post-mining transition practices.[656] The group also conducts assessments of country mining policies to identify where improvements can be made, recently completing assessments in Dominican Republic, Uganda and Madagascar.[657] The group continues to hold annual meetings at the United Nations office in Geneva, in cooperation with the United Nations Committee on Trade and Development (UNCTAD).[658]

Still another group, based in Norway, has created the Extractive Industries Transparency Initiative, or EITI, as a voluntary global effort aimed at strengthening accountability and public trust for the revenues paid for a country's oil, gas and mineral resources.[659] The 48 developed and developing countries presently following the EITI publish reports in which governments and companies publicly disclose royalties, rents, bonuses, taxes and other payments from oil, gas, and mining resources.[660] Although there is plenty of room for growth, EITI is perhaps one of the most successful initiatives the mining industry has engaged in towards sustainable development goals, in particular the goal of economic and social development by way of reduced corruption. Transparency

[655] Global Dialogue <http://globaldialogue.info/framework.htm> accessed 28 February 2015.
[656] Global Dialogue <http://globaldialogue.info/framework.htm> accessed 28 February 2015.
[657] Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development, Communique (29 October 2015) <http://globaldialogue.info/IGF-AGM%202015-communique%20-%20EN.pdf> accessed 21 January 2016.
[658] Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development, Communique (29 October 2015) <http://globaldialogue.info/IGF-AGM%202015-communique%20-%20EN.pdf> accessed 21 January 2016.
[659] Extractive Industries Transparency Initiative <https://eiti.org/> accessed 28 February 2015.
[660] Extractive Industries Transparency Initiative <https://eiti.org/> accessed 28 February 2015.

in payments allows the domestic public and NGOs to trace money, determine whether extractive industry benefits are flowing to local communities, and helps root out corruption and bribery. EITI continues to gain members, including more developed and developing countries, and continues to monitor compliance with EITI 2011 and 2013 requirements, with transparent reporting by EITI and the government.[661]

Several private NGO, industry and joint initiatives also have attempted to provide guidance towards sustainable development in the mining sector. In 2005, a joint group of NGOs, retailers, investors, insurers, and technical experts working in the minerals sector created the Framework for Responsible Mining.[662] The Framework outlines environmental, human rights, and social issues associated with mining and mined products and seeks to crowd-source ongoing contributions to the document. The Natural Resource Charter is "a set of principles for governments and societies on how to best harness the opportunities created by extractive resources for development," referencing "the ingredients successful countries have used."[663] The Charter provides best practices for governments and societies created by an independent group of experts in economically sustainable resource extraction.[664] Neither the Framework for Responsible Mining nor the Natural Resource Charter appear to have gained traction within the mining industry to date.

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[661] Extractive Industries Transparency Initiative <https://eiti.org/> accessed 28 February 2015.
[662] "Framework for Responsible Mining," (2005) <http://www.frameworkforresponsiblemining.org/index.html> accessed 10 January 2015.
[663] Natural Resource Charter (2009) http://naturalresourcecharter.org/ accessed 10 January 2015. The Natural Resource Charter recently merged with the Revenue Watch Institute to form the Natural Resource Governance Institute <www.resourcegovernance.org>.
[664] Contributors included Nobel Laureate in Economics Michael Spence, Paul Collier, Director of the Centre for the Study of African Economies at Oxford University, Karin Lissakers, former Director of Revenue Watch Institute, Tony Venables, Director of OxCarre at Oxford University, with an Oversight Board chaired by Ernesto Zedillo, former President of Mexico.

Private Mining Industry Efforts Towards Sustainable Development Marked By Reluctance But Positive Developments To Build On

Any industry efforts towards sustainable development are to be commended, and the mining industry has made some efforts in recent years, once market pressures required them to do so. Additionally, the industry-specific initiatives appear to gain more adherence than more general initiatives such as the Global Reporting Initiative. This could be due to industry-specific needs, or arguably because the industry-specific initiatives are watered down by industry itself. The former appears to be most likely, since the industry-specific initiatives discussed above are more specific and carry some enforcement mechanisms that more general global reporting initiatives lack, indicating sincere industry intent towards sustainable development efforts. However, for the following reasons, reliance upon private mining industry efforts alone to achieve sustainable development goals in mining activities will not bring about the desired success.

First, voluntary efforts by private industry are largely unenforceable and subject to manipulation or lip-service, also known as corporate greenwashing. Enforcement can come in many ways, ranging from independent third-party audits or transparency regimes (such as EITI) to domestic government enforcement through civil or criminal penalties. But most companies will not voluntarily submit to enforcement schemes absent significant societal pressure, and governments in developed and developing countries are reluctant to impose regulations and restrictions inhibiting commerce.[665] To

[665] Newly-elected President Trump in the United States initiated a roll-back of business regulations in one of his first days in office. Brian Naylor, National Public Radio, "Trump Acts to Roll Back Regulations on Businesses," (30 January 2017) <http://www.npr.org/2017/01/30/512445032/trump-acts-to-roll-back-regulations-on-businesses> accessed 1 August 2017.

its credit, the mining industry itself, facing faltering investment funding and reduced access to new natural resources, initiated engagement in the sustainable development movement through the MMSD program and other activities. However, these efforts are voluntary, there generally are no enforceable binding agreements, and actual progress by mining companies towards sustainable development goals is difficult to determine in a soft mining market. While some mining companies may take sustainable development seriously, others may simply feign dedication with no consequences. Further complicating this dilemma is the fact it is difficult to determine which companies are in which camp. Publicly-traded Glencore's role in the Congolese mining corruption matters highlights this problem, as Glencore is one of several ICMM mining company members ostensibly dedicated to sustainable development.[666] Mining companies may also be simply telling shareholders, investors or government officials what they want to hear through their social and environmental reporting,[667] with little or no intent to carry through on any voluntary sustainable development activities. Mining companies also may be complicit with government officials in pronouncing sustainable development goals for a project when the company, the officials or both know or should know the goals cannot or will not be achieved. Strong national and local mining regulations are needed to provide enforcement mechanisms.

[666] Glencore joined ICMM in 2014, which was around the same time the Congolese corruption issues attracted attention, and Glencore's joining ICMM may have been a response to the Congolese matter, making Glencore's true commitment to ICMM and sustainable development questionable.

[667] Alberto Fonseca, "How credible are mining corporations' sustainability reports? a critical analysis of external assurance under the requirements of the international council on mining and metals," Corporate Social Responsibility and Environmental Management, 17:6 (Nov./Dec. 2010) 355–370, <http://onlinelibrary.wiley.com/doi/10.1002/csr.230/full> accessed 27 January 2016. The author discusses corporate environmental and social reporting plus third party verification processes and recommends improvements.

Second, existing mining industry efforts towards sustainable development come nowhere near full inclusion of the entire mining industry from prospecting to mine operations to post-mine closure actions. Small-scale mining, local "artisanal" mining, prospecting companies, and other smaller actors in the mining industry have mainly been left out of the above-referenced private mining industry initiatives towards sustainable development,[668] although these smaller mining operations account for an untold amount of sustainability concerns and may account for the majority of individual livelihoods in the mining sector.[669] There are two exceptions, the IIED has done limited work towards small-scale and artisanal mining efforts towards sustainable development, and it was a topic of discussion at the 2015 Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development meeting. However, the fact remains small and local mining operations, involving a few people to a few dozen people, or involving prospecting only, remain unidentified and difficult to regulate but contribute an indeterminable amount towards threats to human health and environment, local populations, worker safety and the like. Nor are these smaller operations[670] lining up to voluntarily join sustainable development initiatives, possibly because they have thin profit margins and see sustainable development only as a cost, or because the company

[668] These smaller mining operations have likely not been intentionally excluded, but rather left out because they are too small to garner attention, are privately held, or their owners and operators have not expressed interest in inclusion.

[669] Luke Danielson and Gustavo Lagos, International Institute for Environment and Development (IIED), "The Role of the Minerals Sector in the Transition to Sustainable Development" (May 2001) <http://pubs.iied.org/pdfs/G01052.pdf> accessed 27 January 2016; International Labor Organization, "Social and labor issues in small-scale mines" (1999) <http://www.ilo.org/global/publications/ilo-bookstore/order-online/books/WCMS_PUBL_9221114805_EN/lang--en/index.htm> accessed 27 January 2016. The International Labor Organization, discussed in chapter three, estimated small-scale and artisanal mining accounted for employment of 11 to 13 million people in Latin America, Asia and Africa in 1999, and as many as 80 to 100 million people rely on these small-scale mines for their livelihoods.

[670] Untold numbers of smaller operations also operate illegally, without proper government licenses and without owning the land upon which they operate. These illegal operations are unlikely to make themselves known for sustainable development purposes as this would risk shut-down of the operations.

owners and operators have less regard for sustainable development, or because insufficient government or other pressures exist to encourage or enforce sustainability. National and local governments need additional resources and leverage to identify and regulate these smaller operations.

Third, existing and defunct mining operations throughout the world already lack safeguards to protect human health and the environment now and in the future. In other words, the damage is already done in many places, especially where abandoned or "orphan" mines exist. Mines currently in operation fail to protect the local communities, worker safety and the environment, natural resources are already consumed at unsustainable rates, and future generations have not been taken into account. Mine pits and toxic mine waste exist all over the world, the mining companies are often long gone, and the threats to human health and the environment remain over the local population with no responsible actor to remediate. For example, the town of Butte, Montana previously hosted one of America's largest and oldest copper mining operations, Anaconda Copper Mine, but ARCO later bought and closed the mine, leaving a toxic pit filled with heavy metal laden water that threatens the groundwater and drinking water of the surrounding valley and is the federal government's largest superfund environmental cleanup site.[671] Sustainable development efforts begun in the past few years will not be

[671] Ryan DeMars, Carleton College Science Education Research Center, "Health Hazards from Mining in Butte, Montana" (undated) <http://serc.carleton.edu/NAGTWorkshops/health/case_studies/butte_case_stud.html> accessed 26 January 2016. As rains and surface waters increase, the height of the pit water threatens to overflow, and a water processing plant is being constructed to attempt to treat some of the pit water so that the overflow threshold is never reached, although there are no current plans to treat all of the pit water or otherwise remediate the site.

able to unwind this damage. Likely, national governments will need funds established, possibly paid by existing or new mining fees, to remediate the past and ongoing damage.

Fourth, the nature of the corporate form itself is partially to blame for mining company reluctance or inability to fully engage in sustainable development efforts. In nearly all jurisdictions, the mining company's legal obligation is to maximize owner or shareholder value, whether public or privately held. This is also true of joint ventures and partnerships. The consequences of failing to maximize shareholder or owner value include expensive shareholder lawsuits, shareholder and owner ousting of leadership, reduced profits and reduced leadership compensation, or winding down of private going concerns. For this reason, any activities that reduce value, such as undertaking costly sustainable development programs, may place the company at risk of any of these consequences. A counter-argument is that the reduced access to capital and domestic natural resources experienced by many mining companies lacking sustainable development programs itself has or may reduce owner or shareholder value, however this argument has yet to be tested and accepted in defense of shareholder lawsuits. The safest path, then, for mining companies is to only take steps that can definitively be shown to maximize value, and sustainable development efforts may not yet have reached the point at which they definitely maximize value. Domestic legislation modifying the corporate form to allow sustainable development efforts to be considered maximizing shareholder value is an option, but unlikely to be adopted as shareholders, investors, lawyers and bankers would not welcome such change and uncertainty.

Fifth, leadership in mining companies also changes frequently, including CEOs and board members. While one CEO or a core group of board members may be

committed to sustainable development at one point in time, such as when the mining industry is strong and costs associated with sustainable development efforts are a small percentage of operating costs, this may change quickly with a change in economic circumstances or leadership. Leadership also frequently changes in economic downturns, Molycorp had three CEOs in one year just prior to bankruptcy filing. The dedication of one CEO or group of board members towards sustainable development efforts does not guarantee the company will stay the course for the future, including the years and decades that mine operations are ongoing.

Sixth, it is much easier for a company to support sustainable development efforts during strong economies. Sustainable development activities typically cost time and money, such as double-lining mine tailings ponds, transporting mine waste for proper disposal, limiting current natural resource consumption to allow for future generations, and most other sustainability activities. In strong economies, mine investment is easier to obtain and funds for sustainable development activities are more available. In weak economies, such as the mid-2010s, investment has nearly dried up, mining companies are filing bankruptcy and drastically cutting back mining activities, and in tight economic times the "luxuries" of sustainable development efforts are likely short-changed. In this regard again, strong national mining laws with strong enforcement are necessary to ensure sustainable development goals will continue to be met.

Seventh, with global focus trending away from sustainable development and towards global security and slow economy concerns, the economic and social pressure that led mining companies to take on sustainable development efforts may wane with a commensurate waning of mining company commitment towards sustainable

development. In other words, sustainable development may be trendy now, but global security and economic issues are presently of more dire concern, and it may be that in the future sustainable development goals are less important to governments and people and consequently lose support. Again, strong national mining laws and proper enforcement to meet sustainable development goals are necessary so that focus is not lost in this important area.

Eighth, the "natural resource curse" discussion in the early 2000s, discussed in chapter three, as well as the sustainable development movement likely contributed towards these challenges. The discussion of the "natural resource curse" likely increased the perception that mining was an overall detrimental or negative economic activity. NGOs and other groups promoting sustainable development have done little to curb this perception or work towards promoting improvements in mining practices to mitigate negative effects.

Ninth, consumer-directed efforts are not suitable for mined products. Unlike Non-GMO and "fair trade" labeling on food and other consumer products, the companies taking mined products and putting them into finished products cannot or will not either take the time or have the ability to determine whether the components of components of their finished products are "sustainably sourced." This supply chain management and certification issue becomes difficult to trace back so many levels, even for large consumer product companies such as Hewlett-Packard and Nike that aspire to certify sustainable supply chain management.[672] Even if accurate global tracing and managing

[672] Craig R. Carter and Dale S. Rogers, "A framework of sustainable supply chain management: moving toward new theory," International Journal of Physical Distribution & Logistics Management, 38:5 (2008) 360–387 <http://dx.doi.org/10.1108/09600030810882816> accessed 26 January 2016.

and reporting were possible, few if any consumers or end users know what rare earths are, nor will having a label indicating "rare earths sustainably sourced" on a hybrid car mean anything or even get the consumer's attention, as the consumer mainly pays attention to the price tag, gas mileage and trim options.

Tenth, publicly-traded securities reporting requirements are ineffective. Many mining companies are not publicly-traded on stock exchanges and therefore are not subject to the reporting requirements. Even for mining companies subject to these reporting requirements, they are essentially window-dressing. Reporting requirements do not include any enforcement mechanisms to ensure companies actually carry out sustainable development activities, they simply require companies to report on what they are doing. But companies are already required to report on their operations, in documents hundreds of pages long that go unread by nearly everyone. Additionally, companies simply work out standard language to meet the reporting requirements with their securities lawyers, then include this language in each subsequent report. Perhaps the first time the language appears it is read by lawyers and institutional investors, but is thereafter ignored. Conflict minerals[673] reporting requirements is an example, as certain US companies were required to conduct and certify reasonable country of origin inquiries to avoid using conflict minerals, but what emerged was a template for the reporting language and no real enforcement mechanisms, and even that may be repealed

[673] "Conflict minerals" refers to certain minerals originating in the Democratic Republic of the Congo and adjoining countries in Africa, the profit from the trade of which is alleged to be funding armed groups in that region. U.S. legislation, specifically Section 1502 of the Dodd-Frank Act, and the OECD guidance regarding conflict minerals discussed above required or encouraged companies to conduct a "reasonable country of origin inquiry" or due diligence on the entire supply chain to confirm that their products do not contain conflict minerals.

by the new Trump Administration.[674] At least two areas of promise do exist. First, the Dow Jones Sustainability Index and similar mechanisms have tracked sustainable development efforts of publicly-traded companies for nearly two decades, allowing investors who include sustainable development considerations in investment selections to have reliable information upon which to make investment decisions. The DJSI and other similar indices allow sovereign, institutional and individual investors to invest in companies sharing a sustainable development philosophy, and the more investors make such choices the more publicly traded companies will chase the investor money.[675] Additionally, corporate sustainability reports have been common since the 1990s, spurred in part by the Global Reporting Initiative, and provide investors and others with at least some information on publicly traded companies' sustainable development efforts, although these reports can be more specific as well as better regulated and mandated.[676]

[674] Conflict-Free Sourcing Initiative, "Conflict Minerals Reporting Template" <http://www.conflictfreesourcing.org/conflict-minerals-reporting-template/> accessed 26 January 2016. Lauren Compere, "Repeal and Replacement of Conflict Minerals Rule 1502 Undermines Peace and Stability in the Congo," Huffington Post (4 April 2017) <http://www.huffingtonpost.com/entry/repeal-and-replacement-of-conflict-minerals-rule-1502_us_58e34778e4b02ef7e0e6e052> accessed 1 August 2017. The template is the result of joint efforts of the Electronic Industry Citizenship Coalition, a Delaware corporation ("EICC") and the Global e-Sustainability Initiative, a Belgian international not-for-profit association ("GeSI"), with well-meaning intentions to assist companies in carrying out their country of origin inquiries and complying with certification requirements.

[675] These efforts can be further promoted if national and state legislation is enacted requiring investors of sovereign, pension and other large funds to consider sustainable development in investment decisions, or require a portion of investments to be made in companies with strong sustainable development records and commitments, such as those listed in DJSI.

[676] Ioannis Ioannou and George Serafeim, "The Consequences of Mandatory Corporate Sustainability Reporting: Evidence from Four Countries," Harvard Business School Research Working Paper No. 11-100 (20 August 2014) <http://ssrn.com/abstract=1799589 or http://dx.doi.org/10.2139/ssrn.1799589> accessed 26 January 2016; Thomas M. Parris, "Corporate Sustainability Reporting," Environment: Science and Policy for Sustainable Development, 48:5 (2006) 3-3 <http://dx.doi.org/10.3200/ENVT.48.5.3-3> accessed 26 January 2016.

NGO Efforts Towards Sustainable Development in Mining Often Distrusted

Although mining plays a major role in the global economy, little private effort has been made until recently to engage the mining industry in discussions and efforts towards sustainable development. This is remarkable considering not only the major role mining holds in the economy, but also the development potential mining carries and the damage mining can cause to human health and environment if not managed properly. Even with emerging efforts by NGOs, there are many impediments and drawbacks to reliance upon NGO efforts to fully engage the mining industry in sustainable development actions.

First, many environmental and other NGOs generate attention and funding support through "name and shame" activities, such as investigating and publicizing environmental damage or corruption in mining contracts. These types of activities are important for domestic and international audiences to understand the risks posed by an improperly regulated mining industry. These activities also garner attention and donations for the NGOs. But many of these NGOs could lose donor support if the NGOs began cooperating with the mining industry to improve sustainable development practices, seen as "selling out," instead of continuing in a "no negotiation with the enemy" posture that some financial supporters may prefer. Not only the NGOs but also their supporters and donors may prefer the NGO engage in "name and shame" rather than work cooperatively towards concrete solutions. Also, name and shame is easier and takes less effort, whereas finding common ground takes significant effort, effort that most NGOs have been unwilling to put forth. This aspect of NGOs raises the question who "elected" the NGOs or gave them their legitimacy and selected the activities they

engage in or do not engage in.[677] Suffice to say, some NGOs choose for various reasons to work outside the government or industry, referred to as "outsider NGOs," while some NGOs choose to at least occasionally work with government or industry or other established institutions to attain certain goals.

Second, for good reason many NGOs distrust the mining industry. Mining has historically been a dirty and dangerous activity that scars the earth, takes human lives, violates human rights, and causes irreparable damage to the soil and water environments. Nor has this history dissipated. For example, Talisman Energy of Canada was recently forced to admit it allowed repressive Sudanese government forces to use the company's airstrip to carry out local human rights abuses.[678] If the mining industry wanted to clean up its activities, it had decades and centuries to do so. Nor are there sufficient obvious reasons for NGOs to believe the mining industry is ready to change its ways now. While there have been recent strains on mining industry capital and access to resources based in part on the industry's poor environmental record,[679] these strains do not appear to be so significant and globalized to force the entire industry to truly engage in enforceable sustainable development actions around the world.

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[677] Hugo Slim, "By What Authority? The Legitimacy and Accountability of Non-Governmental Organisations," International Council on Human Rights Policy (2002) <http://www.gdrc.org/ngo/accountability/by-what-authority.html> accessed 6 March 2016.

[678] Peter Muchlinski, "Social and human rights implications of TNC activities in the extractive industries," in United Nations Conference on Trade and Development, Transnational Corporations 18:1 (April 2009) 125-136 <http://unctad.org/en/Docs/diaeiia20097_en.pdf> accessed 27 January 2016.

[679] Heledd Jenkins and Natalia Yakovleva, "Corporate social responsibility in the mining industry: Exploring trends in social and environmental disclosure," Journal of Cleaner Production, 14:3-4 (2006) 271-284 <http://www.sciencedirect.com/science/article/pii/S0959652605000375> accessed 27 January 2016. The authors note that the financial industry has growing focus on both risk management and corporate social responsibility, with capital availability tied to these issues, and the mining industry is increasingly screened out of socially responsible investing funds.

Third, many environmental NGOs would prefer no mining occur at all.[680] While it is true mining activities have costs to human health and the environment, so does all human activity. It is unrealistic to expect people, developing countries and industry to cease activity. It also is patronizing and harkens back to colonialism for developed country-based NGOs and their donors to desire that less developed countries remain pastoral or nomadic herders while developed country donors have much higher standards of living and make donations to NGOs using their smartphones and online banking. Ironically, many of these same NGOs promote the green economy and technological advances, creating websites suitable for iPhone viewing and online donations, while all of these technologies require the same copper and rare earths for which the NGOs want mining activity stopped. The hypocritical aspect of these NGO positions is problematic and may lead NGOs to suffer missed opportunities for advancing their goals.

Fourth, and perhaps related to the third factor of a "mining ban" preference, is NGOs inability or unwillingness to recognize the benefits mining can bring to a region and country. For example, the United Nations Commission on Trade and Development reports that one gold mining venture in Tanzania has generated local investment of $600,000 in roads, $550,000 in education, $400,000 in health care, and $100,000 in water projects.[681] Admittedly, some of this investment is intended to directly benefit the

[680] Heledd Jenkins and Natalia Yakovleva, "Corporate social responsibility in the mining industry: Exploring trends in social and environmental disclosure," Journal of Cleaner Production, 14:3-4 (2006) 271-284 <http://www.sciencedirect.com/science/article/pii/S0959652605000375> accessed 27 January 2016. The authors note that pressure groups such as Oxfam's Mining Campaign and Friends of the Earth International's Mining Campaign "have consistently targeted the sector at local and international levels, challenging the industry's legitimacy" in attempts to resist economic globalization.

[681] Josaphat Kweka, United Nations Committee on Trade and Development, "The role of TNCs in the extractive industry of the United Republic of Tanzania," Transnational Corporations 18:1 (April 2009) 104 <http://unctad.org/en/Docs/diaeiia20097a4_en.pdf> accessed 26 January 2016.

mine operation, but these investments also benefit the local community directly and indirectly. Environmental and other NGOs neither recognize these benefits nor attempt to work with the mining companies to increase these benefits. It must be noted that $1.5 million in local investments from one gold mine is likely far greater than any NGO investment in the same area. NGOs must recognize that mining companies can be important and wealthy partners in local infrastructure investment and sustainable development efforts.

Fifth, NGOs do not appear to acknowledge or take advantage of inherent aspects of the mining industry.[682] For example, the iron ore market's major cost factors include transportation costs, typically rail and ports for shipping to importing markets, which require local infrastructure investment and development. NGOs could work more closely with local and national governments and mining companies to ensure this infrastructure development is completed pursuant to sustainable development principles, such as using local labor, conducting environmental impact assessments and mitigating environmental costs, and ensuring the infrastructure benefits the local and regional communities for current and future development. As was true in America, Great Britain and elsewhere during industrialization in the 1800s, the location of rail stops and ports can make or break whole towns and cities, and the importance of this infrastructure development to local communities and the environment should not be ignored by NGOs. Similarly, some mined products such as rare earths and copper require smelting and

[682] The argument has been made, albeit somewhat weakly, that corporations are the only mechanisms by which to achieve sustainability. Jason Pmo and D. Scott Slocombe, "Exploring the origins of 'social license to operate' in the mining sector: Perspectives from governance and sustainability theories," Resources Policy 37:3 (September 2012) 346-357 <http://www.sciencedirect.com/science/article/pii/S0301420712000311> accessed 27 January 2016.

processing,[683] the skills and technology for which can benefit local community development but also potentially harm the environment. NGOs could work more closely with local and national governments and mining companies to ensure local community education and skills training as well as environmental protection for processing activities.

Sixth, NGOs appear to ignore the fact that the mining industry prefers stabilized political and social environments, and by extension the mining industry can itself be a stabilizing factor for developing countries.[684] Mining companies and their investors do not want to operate in countries presenting uncertainty regarding return on investment, taxation schemes, repatriation of a sufficient level of profits, and long-term predictability. For this reason, mining companies will encourage national governments to provide certainty in these and other areas. Towards this end, NGOs could work with national governments and the mining industry to encourage domestic political stability in exchange for increased mining company investment, potentially creating a circular stabilizing influence for a developing or post-conflict country.

Seventh, NGOs do not appear to fully realize the role national governments retain regarding sustainable development in the mining industry.[685] While mining companies,

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[683] In developing countries, sometimes skilled workers are brought in from other countries rather than educating and using local workers, and also processing is sometimes done elsewhere due to lack of infrastructure to support processing or lower cost and higher skilled labor existing elsewhere.

[684] David Humphreys (Rio Tinto), "Viewpoint: Sustainable development: can the mining industry afford it?" Resources Policy 27:1 (March 2001)1-7 <http://www.sciencedirect.com/science/article/pii/S0301420701000034> accessed 27 January 2016.

[685] Bonnie Campbell, "Corporate Social Responsibility and development in Africa: Redefining the roles and responsibilities of public and private actors in the mining sector," Resources Policy 37:2 (June 2012) 138-143 <http://www.sciencedirect.com/science/article/pii/S0301420711000377> accessed 27 January 2016. The author highlights the "governance gaps" and notes these "governance gaps" need to be remedied in order for the mining sector to better contribute to development and poverty reduction. EITI and similar efforts can assist in these improvements.

financial backers and others have influence, a corrupt national government will likely exploit mining assets and revenues regardless the sustainable development initiatives in place.

On a related positive note, EITI as a multi-stakeholder initiative is commendable for promoting government transparency of extractive industries payments, but membership needs to grow and more members need to come into full compliance. Likewise, the ICMM developed a Sustainable Development Framework, including ten *binding* key principles such as ethical business practices, upholding basic human rights and cultural respect, science-based risk management, improved health and safety and environmental performance, biodiversity conservation, recycling, and transparency. ICMM's enforcement is through annual reporting and third party assurances based on the Global Reporting Initiative standards. ICMM's efforts are credited for increasing reporting by the mining industry.[686] These efforts should be expanded or mandated by governments.

Significant Opportunities Exist for Mining Industry and NGO Partnerships Towards Sustainable Development

Significant opportunities exist for combining private efforts between NGOs and mining companies large and small to promote sustainable development goals, indeed sustainable development is by a large a mutually beneficial goal for the NGOs and mining companies. Unfortunately there is so much distrust and so little communication between NGOs and the private mining industry, combined efforts between the two are infrequent and insufficient. Bright spots exist, such as EITI and ICMM's efforts as well

[686] Fabiana Perez and Luis E. Sanchez, Assessing the Evolution of Sustainability Reporting in the Mining Sector, Environmental Management 43:6 (June 2009) 949-961 <http://link.springer.com/article/10.1007/s00267-008-9269-1> accessed 27 January 2016.

as public company voluntary efforts, but significant room for improvement exists. This improvement could be fostered by public international institutions, in the form of bringing mining companies and cooperative NGOs together to work towards mutually agreeable and mutually beneficial short- and long-term sustainable development goals. These efforts can be characterized as a public-private partnership for shared value, discussed in the next chapter.

Chapter Seven

Conclusions: Path Forward for Sustainable Development in Mining Industry through Public-Private Partnership For Shared Value

Introduction

This chapter first provides a comprehensive analysis of the external and internal challenges facing public international institutions in their promotion of sustainable development in the mining sector. Next, this chapter employs a standard problem-solving framework towards addressing these challenges, identifying available resources and community partners and proposing a potentially more comprehensive and successful path for public international institutions to promote sustainable development in the mining sector through a public-private partnership for shared value. Finally, this chapter proposes expansion on this thesis and its conclusions towards application in other sectors and industries.

External Challenges

Many of the external challenges for incorporating sustainable development into the mining sector arise from the historical nature of the mining industry itself. These challenges include the fact that the mining industry has a few large publicly-traded companies that have taken admirable if mainly voluntary steps towards incorporating sustainable development goals in mining activities, while the remaining smaller, private, prospector and domestic-based mining companies fail to do so with impunity. Although the large multi-national publicly-traded mining companies do not always directly compete with these smaller companies, the fact that the smaller companies largely do not incorporate sustainable development into their activities places the larger companies at a competitive disadvantage. This situation poses a disincentive for large and small mining

companies to additional, enforceable sustainable development principles, unless such principles are enforced equally across the mining industry.

The mining industry also has historically been, and often still is, a destructive industry with detrimental effects on human health and environment. Change will be slow and suspicion high for some time to come. Existing and defunct mining operations throughout the world already lack safeguards to protect human health and the environment now and in the future, and adopting mandatory or voluntary sustainable development principles at this point are unlikely to fully address past and ongoing damages. The costs for the past and ongoing damages of existing and defunct mining operations are massive, but imposing those costs on mining companies alone, or on future mining projects, while seemingly equitable, also creates a disincentive for future mining investment and development, and may impose those costs on companies that are innocent of the past damages and are among the few companies incorporating sustainable development principles into their work. The counter-argument is that few if any mining companies are innocent when it comes to environmental protection or sustainable development, and it is fundamentally unfair for industry, principally its foreign owners and shareholders, to reap the financial gains from decades of mining activities without bearing the full long-term costs. All of these factors point towards the necessity for universal, strong, enforceable domestic laws requiring domestic and multi-national mining companies to adhere to at least a basic set of sustainable development requirements.

The nature of the mining industry and the corporate form itself are partially to blame for some of these challenges. Corporate laws require company efforts to

maximize shareholder value, and do not allow for alternate primary goals such as sustainable development. Sustainable development efforts are viewed as operating costs that reduce shareholder value, although this may not be true if access to capital and raw natural resources is less available to mining companies that do not incorporate sustainable development principles into their work. Public company reporting requirements, such as those for conflict minerals, are ineffective except to briefly draw attention to a hot-button social issue, and only for publicly traded mining companies. Corporations, especially mining corporations, also have high leadership turnover. This jeopardizes long-term commitment to sustainable development efforts because one CEO making sustainable development a priority and willing to absorb the associated costs may depart or be removed in favor of another CEO with reduced commitment to sustainable development or willingness to accept the associated costs. Mining projects also are generally long-term in nature because of high initial investment and start-up costs, meaning a current CEO may be committed to sustainable development but the past CEO's activities in mine start-up may hinder the current CEO's actions.

Additionally, costs for sustainable development activities are easier to absorb and justify during strong economies and high metal and mined product prices, but the 2010s so far have shown metal and mined product prices are highly volatile, and sustainable development activities may be vulnerable in down economies when drastic cost-cutting is necessary for mining companies to survive. Furthermore, consumer-directed efforts are generally not suitable for mined products, as mined products are part of the much larger global supply chain, meaning they are components of components of finished industrial or commercial products. Accurate global supply chain tracing, managing and

reporting is nearly impossible, but even if it were possible few consumers or end users will make purchasing decisions based on sustainable sourcing of a fractional percentage content. The corporate form, leadership turnover, consumer-led initiative limitations and volatile mining markets are likely permanent fixtures in the mining industry. But, these issues again point to the necessity for universal, strong, enforceable domestic laws requiring mining companies to comply with at least basic sustainable development requirements. Shareholder, consumer and domestic and international NGO pressure to adopt and follow enforceable sustainable development principles or face reduced access to capital and raw natural resources also may address these problems.

Additional challenges arise from sources beyond the industry itself. Global security continues to challenge and often overtake sustainable development as the global political, economic and social priority. For example, United Nations leadership has been attempting to incorporate a broader role for the organization for nearly three decades, with increased focus on development and poverty reduction, but global security issues continue to dominate its work. Additionally, there is the potential for a "natural resource curse," in which developing countries with abundant natural resources may be worse off than those with fewer natural resources for development. The difference between negative and positive outcomes in countries with more abundant natural resources appears to lie with adoption and enforcement of domestic legislation for investment transparency, corruption prevention, and environmental protection. These are components of a standard sustainable development program, again pointing to the necessity for universal, strong, enforceable domestic laws requiring domestic and multi-national mining companies follow a basic set of sustainable development requirements.

In “natural resource curse” terms, such domestic laws will actually help ensure stronger domestic growth and development.

Domestic and international NGOs also face challenges in effectively promoting sustainable development in the mining industry. Many NGOs, especially some high-profile international NGOs, generally disfavor industrial development and/or operate primarily through “name and shame” activities and investigations, intentionally working outside the establishment to drive conversation and pressure for change. Additionally, many NGOs would simply prefer no mining occur at all, or promote such high expectations for mining activity that no mining could profitably be undertaken. These “outsider NGO” activities are important for domestic and international audiences, but do not necessarily offer solutions or create common ground. Nor do these outsider NGOs always recognize that mining activity will continue to occur, indeed human consumption demand requires it. For this reason, “insider NGOs” are needed to work with industry, government and international institutions to create common ground and effectively promote sustainable development goals. Insider NGOs recognize that mining activity will continue to occur, recognize that failure to work with government and industry may push mining activity to less regulated locations, and recognize that mining can be a tool for sustainable development. Insider NGOs can work with industry, government and international institutions to ensure mining activity occurs with enforceable sustainable development principles to the largest extent possible. Insider NGOs also can work with local governments and constituents to ensure local community education, skills training, infrastructure development, education and environmental protection occur. Furthermore, because domestic political stability and regulatory certainty is desirable to everyone,

including mining companies, and insider NGOs can work with industry, government and international institutions towards universal, strong, enforceable domestic laws for a basic set of sustainable development requirements, which can help attract additional mining investment and development.

Domestic governments themselves create substantial challenges to the adoption of enforceable sustainable development principles for mining activity. Many governments of developing countries want aid for trade and other purposes with few strings attached, allowing domestic governments and leaders to use aid for trade and development as they see fit. This position makes sense at least on the surface, as domestic governments and leaders may be in a better position to know how and where aid and development assistance is needed and how best to deliver it. Of course, unrestricted aid and development assistance gives rise to concerns regarding lack of technical capacity to create development from trade, domestic corruption, favoritism, political paybacks or retribution, and general ineffectiveness. Domestic governments, their leaders and citizens, also understandably reject imposition of "western" or industrialized country ideals, which often is seen as a continuation of colonization or hypocritical attempt to impose restrictions that curb industrialization and development that the industrialized countries already enjoy. Domestic governments also assert the same sovereignty over natural resources that developed and industrialized countries have asserted for centuries, and post-colonial countries again understandably want equal respect for their own sovereignty. Domestic governments also recognize that fewer legal and regulatory restrictions will attract more foreign investment, including mining company investment, for purposes including development, hard currency income, and

political power and stability. For these reasons, again, the most promising situation for sustainable development is for industry, government and international institutions, with insider NGO assistance, to adopt universal, strong, enforceable domestic laws with a basic set of sustainable development requirements.

Other external challenges impact on the ability of public international institutions to promote sustainable development in the mining sector. There is significant and perhaps growing skepticism regarding the role of trade in development. This skepticism includes the ongoing debate whether development can be achieved through trade, whether corporations and government-owned industries can and will use gains from trade towards development or simply enriching the already-wealthy, and whether increased global trade and reduced barriers to global trade produces net gains or net losses for individual countries and their workers. The answers to these questions in large part are not empirical but personal and philosophical. Unemployed steel workers and their unions in the United States and Europe likely will not believe trade leads to development or produces net gains, based on personal experience of job loss after China's recent economic downturn and steel dumping. Isolationists generally disfavor global trade on philosophical grounds. Poverty-stricken peoples in urban and rural settings throughout the world have not seen meaningful gains from increased trade to date. Outsiders watching the widening income gap worldwide likely are skeptical that corporate gains from increased trade will benefit anyone other than the corporation's shareholders. However, economists and others also point to reductions in poverty throughout China, India and other developing countries, as well as increased living standards in those countries, largely through reduced barriers to trade and resulting

increased global trade. While it is beyond the scope of this thesis to resolve this debate, indeed a convincing philosophical resolution is likely impossible, the generally-accepted definition of sustainable development includes economic development - often through trade - as one of three pillars. For this reason, and based on a lack of palatable alternatives to trade as a catalyst for development, trade will continue to be the most accepted and likely means through which development is most likely to occur. Appropriate domestic regulations on industrial activity such as mining, including adoption of universal, strong, enforceable domestic laws with a basic set of sustainable development requirements, will help promote trade and development while addressing some of the deleterious outcomes of trade.

A related external challenge for public international institutions arises from skepticism regarding the willingness of trade proponents and actors to incorporate sustainable development principles into trade. This is not merely an academic debate, but instead strikes at the heart of the issue regarding who does and who should be benefitting from trade. To the extent trade benefits mainly the wealthy, or does not demonstrably benefit wage earners or people experiencing poverty, this skepticism will continue. Over the long term, if income inequality and disparate income distribution increases, political instability will likewise increase, ultimately threatening the political system that allowed for the trade that created the income inequality. A related external challenge for public international institutions regards NGO and public reluctance to support trade and the linking of trade with development, in large part based on the skepticism discussed above. As discussed below, public international institutions will need to partner with industry, governments and willing NGOs to ensure sustainable

development principles are in fact incorporated into domestic law and thus into global trade to avoid these problems.

Internal Challenges

In addition to the multitude of external challenges facing sustainable development efforts in the mining industry, the public international institutions that can or should be taking a leadership role in promoting sustainable development have their own internal limitations and challenges.

The United Nations has, at least on paper, made increasing efforts towards promoting and coordinating sustainable development activities, including unanimous adoption of Agenda 2030 and the Sustainable Development Goals. It is clear that the United Nations has the international mandate for promoting sustainable development, but to date the UN has not done nearly enough with this mandate. As discussed above, state sovereignty over natural resources remains a guiding principle within the United Nations, and will continue to pose an obstacle to United Nations efforts towards sustainable development in any particular domestic mining industry. Furthermore, while the United Nations presently faces a planned leadership change, the stated goals of the organization, including the new Sustainable Development Goals, are not expected to change, ensuring continuity at least on paper despite the leadership change. In practice, however, the new Secretary-General may need to focus on global security due to significant challenges posed by regional security threats and the proliferation of extremist and terrorist organizations, taking away from the longer-term and more elusive sustainable development agenda. This ebb and flow of United Nations priorities, reducing the UN's effectiveness, was demonstrated in the Plan of Implementation

adopted at the 2002 World Summit on Sustainable Development, which recognized the role of mining in economic and social development and sought to foster sustainable mining practices, encouraged integration of the fractured institutional framework relating to sustainable development generally, but there is no discernible concrete follow up to this Plan of Implementation. The much earlier 1987 Brundtland Report made similar observations and recommendations, with similar lack of results.

More generally, the United Nations remains too large, inefficient and ineffective to effectively take a leadership role on sustainable development. Over 40 years ago, Principle 25 of the Stockholm Declaration encouraged coordination, efficiency and dynamism among international organizations but this has yet to occur, and no single UN body has overall responsibility for mining or sustainable development. Furthermore, the various UN agencies and entities touching on sustainable development lack clear jurisdiction, boundaries and purposes, overlapping in some areas and lacking coverage in other areas such as mining. A further major hurdle for United Nations institutions is the lack of effective enforcement tools. Even though the Sustainable Development Goals were recently unanimously adopted, there is no mechanism by which to ensure any of the member states carries through with efforts towards accomplishing the SDGs and their associated targets. Instead, the UN institutions rely on reporting, cooperation and peer pressure, with mixed results. Nor is there presently a "report" for sustainable development, although this could be created as discussed below.

Meanwhile, the World Trade Organization has recognized the important role of sustainable development in global trade since its beginning, as stated in the founding Marrakesh Agreement's Preamble. Following on this recognized role of sustainable

development, the WTO has made some efforts towards providing technical assistance towards sustainable development, including partnering with the IMF, World Bank and others, although no WTO efforts are specific to the mining industry. The WTO's Marrakesh Agreement, Articles XX(b) and (g), also specifically allow for legitimate domestic trade restrictions for purposes of protecting human health or the environment or conserving exhaustible natural resources. The WTO's broad interpretations of Article XX(b) and (g) should encourage states to take broad views of threats to life or health and the definition of natural resources, including air and endangered animals and water, and the life or health of people, animals and plants. However, even though the WTO has a unique and enviable enforcement mechanism through its Dispute Settlement Mechanism, the WTO remains a trade-related treaty-based organization and cannot require either domestic adoption of sustainable development programs or require trade-negotiating parties to include sustainable development requirements in trade agreements. The WTO provisions for legitimate *domestic* programs addressing key aspects of sustainable development again reinforce the need for public international institutions to partner with industry, governments and NGOs to ensure sustainable development principles are incorporated into domestic law and thus into global trade.

Like the WTO, the IMF and World Bank have been providing technical assistance for years in support of development, for these two institutions including in the mining industry. More powerfully, the IMF and World Bank facilitate and provide funding towards development. As part of their funding and technical assistance activities, these two institutions encourage or require national governments to adopt at least some environmental protection and sustainable development measures, more

recently including social development and poverty eradication terms. However, implementation and enforcement of sustainable development requirements could be improved. Like the United Nations, the IMF wrote extensively in 2000 and again in 2015 that the mining industry can make a significant contribution towards sustainable development at the domestic level, but also like the UN there has been little progress in incorporating sustainable development principles as part of IMF or World Bank lending activities. One major hindering factor is the tension between IMF and World Bank lending/financing requirements and enforcement in developing countries, especially LDCs. For example, while the IMF has been criticized for not requiring legal and structural reforms in developing countries *prior* to lending, or not withdrawing loan funds if the countries do not meet established goals and targets, it must be acknowledged that lack of funds or withdrawal of funds could itself be destabilizing and ultimately hinder political stability and development. For these reasons, the IMF and World Bank have a delicate balancing act in requiring and enforcing lending prerequisites and requirements. The World Bank also must balance funding of trade and development activities, including mining projects, with social and environmental protections, such as the decision and methods of promoting mining activities in environmentally sensitive areas.

A Proposed Path Forward with a Public-Private Partnership for Shared Value

This part of the thesis uses a standard problem-solving framework to produce a recommended path forward for improvements to public international institutions' efforts towards sustainable development in the mining industry. The problem-solving framework is as follows: recognize and define an existing problem, investigate the causes of the problem, identify available strengths and resources to address the problem,

develop a plan using available strengths and resources to tackle the problem. Implementing the plan, monitoring progress and evaluating the outcome also are part of a standard problem-solving framework, but beyond the scope of this thesis.

(1) Recognizing and defining the problem: At the outset, mining companies, domestic governments, NGOs and public international institutions should be commended for the significant and successful efforts to date towards recognition of the importance of sustainable development both locally and globally, and for the significant efforts to date towards adoption of sustainable development principles and goals. It has taken decades to reach the point of general acceptance that sustainable development is a predominant goal for the international community, which should be celebrated. It must also be recognized that general acceptance of the concept of sustainable development, while perhaps the harder task, leads to the need for enforceable adoption and implementation, which is the current challenge or problem.

The World Bank has described an "extractive industries value chain" that progresses over time. The World Bank writes:

> countries commonly pass through five stages in the transformation of their mineral abundance into sustainable development: (i) the mineral legislation—including the award of contracts and licenses and tax regime—is sufficiently attractive to induce investment in the sector; (ii) the regulatory framework is clear and comprehensive and there is adequate capacity for monitoring and enforcement; (iii) collection of taxes and royalties is done in a transparent and efficient manner; (iv) governments are able and willing to manage and allocate fiscal revenues efficiently; and (v) the mineral sector is contributing to the socially, economically and environmentally sustainable development of the country, including in the host communities and region.[687]

[687] World Bank, "Working Paper: Mining: World Bank support to mining sector reform" (2011) <http://documents.worldbank.org/curated/en/2011/09/16283816/mining-world-bank-support-mining-

With respect to mining, at the present time, the problem is the non-existent or very slow adoption of sustainable development principles and goals into mining sector activities and few enforcement mechanisms, arising mainly due to the lack of existence and enforcement of domestic laws requiring sustainable development in the mining sector. While different countries are at different stages in the World Bank's identified progression, all countries desiring to utilize natural resources for economic development through mining activity should be adopting and enforcing mining legislation that can attract mining investment while requiring at least basic sustainable development principles.

Domestic environmental laws and mining codes have produced excellent standards by which mining companies must operate.[688] Several academic articles exist documenting domestic environmental laws as a gold-standard by which to encourage and ensure environmental protection including in the mining industry context.[689] As Pmo and Slocombe wrote in 2012:

> The development of laws and enforcement of regulations have traditionally been seen as the best way to ensure corporate and environmental compliance, and regulation has always been the favoured response to environmental problems by the public. In this regard, conventional state-led environmental regulation has had many successes and it has been consistently demonstrated that industry responds to regulation and the real possibility of enforcement. Current trends also

sector-reform> accessed 14 February 2016. This paper uses the phrase "extractive industries value chain."

[688] Heledd Jenkins and Natalia Yakovleva, "Corporate social responsibility in the mining industry: Exploring trends in social and environmental disclosure," Journal of Cleaner Production, 14:3-4 (2006) 271-284 <http://www.sciencedirect.com/science/article/pii/S0959652605000375> accessed 27 January 2016. The authors credit Australian and British environmental codes for increasing environmental protection in domestic mining practices.

[689] Jason Pmo and D. Scott Slocombe, "Exploring the origins of 'social license to operate' in the mining sector: Perspectives from governance and sustainability theories," Resources Policy 37:3 (September 2012) 346-357 <http://www.sciencedirect.com/science/article/pii/S0301420712000311> accessed 27 January 2016.

> reveal a continuing desire for the use of government authority, as state intervention and legal regulation of the mining sector is actually increasing around the world.[690]

The threat of legal enforcement and associated costs is seen as one reason mining companies comply with domestic environmental laws. However, national governments also must have the capacity and resources to enforce environmental laws and mining codes, which requires technical competence, funding and willingness. Developing countries may be challenged by enforcement, as Hilson and Murck wrote in 2000:

> In much of North America, Europe, and Australia, comprehensive environmental legislation has been in place for decades, but in a number of South American, African, and Asian countries, environmental laws are still in their infancy, and accompanying enforcement programs are far from effective. The developing world is commonly a location for poorly managed mines, which, because of the 'loose' regulatory environment, tend to employ a number of rudimentary, low-tech methods in mineral extraction and refining processes.[691]

The same capacity and resource issues remain present today.[692] Canada's *Minerals and Metals Policy of the Government of Canada* is viewed as a global model for government adoption of mining policy incorporating sustainable development as well as broader corporate social responsibility standards.[693] This is one of many potential sources for identifying a universal set of basic sustainable development principles for domestic law.

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[690] Jason Pmo and D. Scott Slocombe, "Exploring the origins of 'social license to operate' in the mining sector: Perspectives from governance and sustainability theories," Resources Policy 37:3 (September 2012) 346-357 <http://www.sciencedirect.com/science/article/pii/S0301420712000311> accessed 27 January 2016.

[691] Gavin Hilson and Barbara Murck, "Sustainable development in the mining industry: clarifying the corporate perspective," Resources Policy 26:4 (December 2000) 227-238 <http://www.sciencedirect.com/science/article/pii/S0301420700000416> accessed 27 January 2016.

[692] Hany Besada and Philip Martin, "Mining Codes in Africa: Emergence of a "Fourth" Generation?," North-South Institute (May 2013) <http://www.nsi-ins.ca/wp-content/uploads/2013/03/Mining-Codes-in-Africa-Report-Hany.pdf> accessed 1 August 2017.

[693] Gavin Hilson, "Sustainable development policies in Canada's mining sector: an overview of government and industry efforts," Environmental Science and Policy 3:4 (August 2000) 201-211 <http://www.sciencedirect.com/science/article/pii/S1462901100000861> accessed 27 January 2016.

(2) Investigating the causes of the problem: As discussed in detail above and in the preceding chapters, the causes of the identified problem include external challenges such as the fact that mining does impact the environment and historically has damaged human health, the few large publicly traded mining companies competing with smaller unregulated mining companies with a competitive advantage, corporate requirements to maximize shareholder value and incentives to reduce costs from sustainable development activities, leadership turnover in companies, lack of consumer knowledge and information regarding the entire global supply chain, volatile mining markets with high start-up costs making sustainable development costs difficult to absorb, NGOs disfavoring industrial development and engaging in "name and shame" rather than cooperating with industry and others, national governments wanting aid without strings attached, the strong principle of state sovereignty over natural resources, free trade skepticism, and the pressure for national governments to reduce regulatory burdens to attract more foreign investment.

Internal challenges include the United Nations being too big, bureaucratic and inefficient to effectively promote and coordinate sustainable development efforts, global security threats taking UN attention away from sustainable development, lack of coordination among all the public international institutions, the WTO's limitations as a trade organization and by the terms of the Marrakesh Agreement, the WTO's inability to require sustainable development goals be included in trade treaties unless the parties agree, and the delicate balance the IMF and World Bank must play in promoting, requiring and enforcing sustainable development principles while still facilitating funding and financing for development activities.

(3) Identifying available strengths and resources to address the problem: Through the preceding chapters, what has emerged as the most effective tools towards widespread adoption of enforceable sustainable development principles and goals in the mining sector are (1) NGO and public international institutional technical assistance towards adoption and enforcement of domestic mining, environmental and other laws requiring aspects of sustainable development, (2) public international institutions requiring such laws as part of funding and financing availability, and (3) mining companies engaging with NGOs and public international institutions to incorporate sustainable development principles into mining practices. These tools can be referred to as a public-private partnership for shared value, the shared value arising from both economic development as well as protection and development of social and environmental goals.

For example, the United Nations' Global Environment Facility has provided nearly $100 billion (USD) in grants and co-funding to various national and local environmental projects, as well as facilitating funding for several environmental conventions. The UNDP, UNEP and other UN entities also have successfully used financial incentives such as project financing to encourage adoption of sustainable development aspects. In this regard, financing and development assistance are proven tools for encouraging if not requiring state adoption of at least some aspects of sustainable development, such as environmental protections.

The United Nations' Global Compact is another useful tool, a generally agreed upon set of ten principles for companies to adopt as essentially a corporate social responsibility policy. The ten principles include protection of human rights, elimination

of forced and child labor and employment discrimination, environmental responsibility and anti-corruption efforts. The Global Compact also is encouraging the more robust reporting contained in the mining industry's Global Reporting Initiative current guidelines. These mining industry guidelines, through the ICMM's Sustainable Development Charter and Framework, involve binding principles and third party assurance of compliance, and provide an important industry-led tool for promoting sustainable development. The mining industry also promotes the Voluntary Principles on Security and Human Rights and the Inter-Governmental Forum on Mining, Minerals, Metals and Sustainable Development's "Mining Policy Framework." All of these tools can be used to form the backbone of an agreeable basic set of sustainable development policies and practices for domestic law.

Another potential asset is the United Nations' primary enforcement mechanism of periodic reporting and review processes to monitor compliance and progress towards ensuring treaty obligations are carried out domestically, including incorporation into national law. For example, the United Nations Human Rights Council undertakes a Universal Periodic Review process for certain United Nations member states, on a five year rotating schedule, although many states need technical assistance to meet the reporting obligations. Member states of the International Covenant on Economic, Social and Cultural Rights (ICESCR) are required to report on their efforts towards meeting minimum core obligations (subject to resource constraints) for compliance as well as their work towards "progressive realization" of all economic, social and cultural rights. The existing national government reporting process can be used as a tool towards

monitoring efforts towards and compliance with sustainable development principles and goals, using existing reported information, as discussed below.

Two additional United Nations treaties establish basic sustainable development principles that should become part of a basic domestic sustainable development program. First, the 1991 Convention on Environmental Impact Assessment in a Transboundary Context (Espoo or EIA) establishes state obligations to conduct environmental impact assessments at early project stages and notify bordering states if the project will have a significant trans-boundary environmental effect, although it has limited membership to date. Second, the United Nations' Declaration on the Rights of Indigenous Peoples, in conjunction with the International Labor Organization's Convention 169, has spurred development of the principle of "free, prior and informed consent" (FPIC) to ensure consent is granted from affected communities before proposed undertakings such as mining operations occur in a locality, although the treaty focuses on the rights of indigenous peoples instead of the preferred FPIC with local communities as a whole. The United Nations and other public international institutions can work towards more universal adoption of these two conventions, including through adoption of the convention requirements into domestic law.

The United Nations' strong mandate for taking a leadership role in sustainable development, including universal adoption of the Sustainable Development Goals at a recent United Nations General Assembly meeting, is another asset. Although the United Nations' focus may be diverted to global security issues, it nevertheless has the ability and mandate to call regional international meetings and conferences relating to sustainable development matters.

The WTO, through research, technical assistance, education and outreach towards developing and least developed countries, has done much to promote a sustainable development agenda. The WTO can continue and expand its technical assistance, education and outreach on the connection between free trade, economic development and sustainable development. The WTO's Committee on Trade and Environment could request the Secretariat provide an update on its very useful 2002 Note outlining the requirements of Article XX(b) and (g), possibly including examples of domestic sustainable development programs that meet these requirements, or working in conjunction with the ICMM and other NGOs to create "model" programs or program terms. The WTO also could work with the World Bank, UNCTAD and others to prepare a model national law and possible funding package for pre-funding responsible mine closure activities that would likely comply with both trade agreements and sustainable development goals. Similarly, the WTO could work with the World Bank and relevant United Nations bodies towards providing technical assistance in drafting national laws promoting sustainable development and protecting exhaustible natural resources.

The World Bank is a key partner in the Extractive Industries Transparency Initiative, making EITI membership increasingly a recognized standard for countries with mining activity and a possible requirement for World Bank project financing support and funding. The Extractive Industries Transparency Initiative itself is the work of an international NGO providing an enforceable mechanism for government transparency in extractive industry contracts and payments, helping ensure government transparency, reducing opportunities for corruption, and allowing companies and governments to work together.

Importantly, the IMF and World Bank work at the domestic and even local level, with institutional access to national and local governments, and these contacts are themselves assets for promotion of sustainable development. Additionally, both the IMF and the World Bank provide important technical assistance to developing countries, often working together and with other public international institutions such as the WTO and UNCTAD to do so. The WTO, World Bank and IMF also have worked together on the Aid-for-Trade initiative, aimed at helping developing countries, in particular LDCs, to build the supply-side capacity and trade related infrastructure needed to implement and benefit from WTO agreements and expand trade. This cross-institutional cooperation is both important and effective, and should be expanded.

Local and indigenous communities have an important, powerful role to play in demanding sustainable development efforts to benefit local development, such as local gender-neutral employment and local investment in infrastructure, education, technical training, and protections for human health and the environment. Shareholders, investors and consumers also have an important role to play, in becoming educated about the global supply chain, corporate sustainability programs and related sustainable development efforts. For these local, investing and consumer constituencies, domestic and international NGOs are perhaps best suited for harnessing the power of these groups and organizing them to make their demands and expectations heard. Domestic and international NGOs also play a broader and equally important role in promoting sustainable development principles and goals, and reporting on problems when sustainable development practices are not followed.

Last but not least, the mining industry itself has a major role to play, engaging in the all the foregoing activities to incorporate sustainable development into mining practices.

(4) Developing a plan to address the problem: As discussed above, the most promising situation for sustainable development is a public-private partnership for shared value, involving industry, government and international institutions, with insider NGO assistance, to adopt and enforce universal, strong domestic mining laws with a basic set of sustainable development requirements. Ideally, all countries would have the same or very similar sustainable development laws and rules for mining to prevent a "race to the bottom" towards countries with the fewest regulations or worst enforcement. This is admittedly challenging because developing countries are competing to attract limited investment funds, including funds for domestic mining projects. The mining industry, domestic governments, public international institutions and domestic and international NGOs all have important roles to play to ensure success.

The United Nations' Agenda 2030 and universal adoption of the Sustainable Development Goals provides an excellent opportunity and catalyst for improving efforts towards sustainable development and expanding enforceable adoption of sustainable development principles and goals by focusing significant attention and efforts towards sustainable development in the coming years. The United Nations' incoming Secretary-General, whoever it may be, could use the opportunity of his or her new position to reaffirm the United Nations' commitment to the Sustainable Development Goals.

The new Secretary-General, or else the World Bank Group, should convene a mining industry-specific international conference with workshops to promote

collaboration and cooperation among national governments, insider NGOs, and public international institutions towards identification of at least a basic set of sustainable development principles to be adopted as domestic national laws or decrees. If a mining industry conference is too large an undertaking, then certainly an international conference for the copper and rare earths mining segments could be arranged. Absent an international conference, national governments and public international institutions could work together and agree to use an existing framework, with input from NGOs and others, to generate this basic set of sustainable development principles for domestic law. NGOs such as the World Economic Forum, ICMM and others can work with the mining industry and public international institutions such as the IMF, World Bank, UNCTAD and WTO towards development of this agreed basic set of sustainable development principles to be incorporated into domestic law. The Extractive Industries Transparency Initiative is one excellent tool that can and should be incorporated into domestic law. Various United Nations treaties, such as Espoo for environmental assessments and the Indigenous Peoples Treaty for free, prior, informed consent, also serve as sources for some of the basic sustainable development principles. Mandatory sustainable development reporting by public and possibly private companies is another option to explore.[694] The ICMM's Sustainable Development Charter and Framework, using Global Reporting Initiative standards, is a potential model to consider. Much like the

[694] Heledd Jenkins and Natalia Yakovleva, "Corporate social responsibility in the mining industry: Exploring trends in social and environmental disclosure," Journal of Cleaner Production, 14:3-4 (2006) 271-284 <http://www.sciencedirect.com/science/article/pii/S0959652605000375> accessed 27 January 2016. The authors studied the top 10 mining companies and determined that by 2003 all produced social and environmental reports but the volume and level of detail varies widely and only Rio Tinto produced site-specific social and environmental reports. Most of the companies were reporting consistent with Global Reporting Initiative guidelines.

Climate Change Conference, participants should be willing to accept "good" or "good start" in lieu of perfection: perfection cannot be the enemy of the good.

Following identification of a generally agreed basic set of sustainable development principles, national governments with domestic mining activities should agree to incorporate the principles into domestic law at the earliest opportunity. Additionally, the IMF and World Bank should incorporate the basic principles into their financing and lending activities (if not already present), and NGOs should promote the basic principles as a starting point for universal domestic law adoption and enforcement. NGOs, both domestic and international, can assist by generating and promoting local and national pressure towards domestic adoption of sustainable development principles for mining activity. The mining industry of course must be at the table for any conversations, and must "buy in" to the process and outcome of a universal set of basic sustainable development principles to be incorporated into domestic law, principles the mining industry can live with and still operate at a profit. The United Nations' existing national government reporting process can be used as a tool towards monitoring efforts towards and compliance with sustainable development principles and goals, using existing reported information and processes.

Once a basic set of sustainable development principles is incorporated into domestic law, the same groups must work to ensure enforcement. The WTO, IMF, World Bank and United Nations all can provide technical assistance and cooperation towards enforcement tools and resources. The mining industry of course should comply with the domestic laws, indeed mining companies should adhere to at least the basic sustainable development principles even without domestic law adoption or enforcement.

Domestic and international NGOs can both provide technical assistance and cooperation as well as identify problems or shortcomings in domestic law adoption or enforcement.

Ultimately, after a basic set of sustainable development principles is incorporated into domestic law and effectively enforced, the basic principles can be expanded to include additional or optional protections and sustainable development goals. Of course, nothing is stopping national governments, the IMF or World Bank, or the mining industry from adopting more than a basic set of sustainable development principles, but a minimum set of enforceable requirements will be a major step forward and help avoid the "race to the bottom."

A Word About Pollution Havens and the "Race to the Bottom"

The mining industry generally, and rare earths and copper mining in particular, are subject to the attraction of "pollution havens," meaning those countries where mining regulations are few or poorly enforced. Similarly, the willingness of some governments like China to allow massive environmental degradation, on a scale visible from outer space, for the goal of economic development fuels this attraction. As the IIED writes, "stringent environmental requirements in Europe and many parts of North America have made it more difficult for companies to operate mines in these regions. This is one reason why little mining is done within the European Union today, save in the building materials sector… In contrast, governments of developing countries are perceived by some to be lowering social and environmental standards, fueling a 'race to the bottom' as countries use lower standards to attract investment."[695] Exploitation of raw materials and

[695] International Institute for Environment and Development, "Breaking New Ground: The Report of the Mining, Minerals and Sustainable Development Project," Draft Report 5 <www.iied.org/mmsd> accessed 29 November 2014.

minerals of developing countries by developed countries and multi-national corporations has long been a concern. At the 1972 Stockholm Conference, "many speakers from developing countries stated that there was exploitation of their natural resources by developed countries for their own purposes; some protested against the activities of certain multinational corporations."[696]

Pollution havens are not a new problem. The adoption of, at the outset, a basic set of sustainable development principles into domestic law, followed by effective enforcement, followed by adoption and enforcement of additional sustainable development principles, is an excellent albeit long-term means of addressing this problem. Some mining companies will always seek out low-regulatory environments, and some countries will always seek to provide lower barriers to mining investment, but with broad adoption of basic sustainable development principles and good enforcement, these mining companies and low-regulation countries will eventually dissipate.

Extrapolation of Conclusions to Other Industries

The mining industry is not the only industry presented with sustainable development goals and challenges. Indeed, all industry and human activity faces and impacts sustainable development. However, the sustainable development movement is fractured and poorly organized presently. Generally, NGOs, industry, governments and public international institutions all carry out their own insulated activities with little communication or coordination, although notable exceptions exist. NGOs sometimes

[696] Report of the United Nations Conference on the Human Environment (16 June 1972), A/CONF.48/14/REV.1, p. 46. Indeed, many specific concerns discussed at the 1972 conference remain problems today, such as use of pesticides and fertilizers and contamination of the seas, population control, nuclear and armaments proliferation, and other contemporary global issues (A/CONF.48/14/REV.1, pp. 45-48). Other issues have either not remained important, such as concerns regarding supersonic aircraft, or have gratefully resolved, such as apartheid.

engage with industry, but without significant government involvement. Other NGOs put pressure on national governments, but without industry involvement. Industry does not seek out partnerships with NGOs or governments or public international institutions. Meanwhile, public international institutions and governments can pose insurmountable bureaucratic hurdles to partnerships with industry or NGOs.

For these reasons, perhaps an industry-specific analysis is a better tool for problem-solving towards sustainable development solutions. The same problem-solving framework presented above can be used for the solar panel industry, or the steel industry, or the corn industry. A conference can be held with key players to identify common ground and basic sustainable development principles for general adoption and enforcement. All the players in a specific sector or industry already have something in common, an interest in and knowledge of that sector or industry. All, or nearly all, of those same players also have an interest in promoting at least some aspects of sustainable development. Working towards a common sustainable development goal with the common interest and knowledge of the participants is a reasonable and manageable outcome. In this manner, the massive global challenge of sustainable development can begin to be tackled one sector and one industry at a time.

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