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# **Devil's Excrement or Manna from Heaven?** A Survey of Strategies in Natural Resource Wealth Management

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# Devil's Excrement or Manna from Heaven? A Survey of Strategies in Natural Resource Wealth Management

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#### Abstract

Case studies and multi-country empirical analyses paint a mixed picture as far as the general link between extractive industries and inclusive growth and development. On the one hand this relates to the significant risks commonly associated with the natural resource curse, faced by countries who wish to tap this wealth for development. Indeed only a few countries seem to have managed this effectively. On the other hand, the mixed results also suggest that the many challenges related to expanding extractive industries are not necessarily unavoidable. Some countries that have taken important steps to improve the governance of their wealth as well as channel these toward productive investments—notably human capital—appear to have transformed the natural resource curse into a boon for development. This paper synthesizes the main lessons drawn from an extensive review of literature on this topic. It outlines the risks attached to the natural resource curse as well as the associated solutions, as demonstrated by empirical evidence and policy experience. Innovative financing mechanisms that reflect good public finance management as well as a prioritization of investments to promote inclusive growth—such as a proposal for an "inclusive growth trust fund"—are also explored in this paper.

JEL Code: L-72; O-15, Q-32 Key Words: mining; extractive industries; human capital; sovereign wealth funds; human development

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#### **1. INTRODUCTION**

Juan Pablo Pérez Alfonso, founder of the Organization of Petroleum Exporting Countries (OPEC) phrased the risks attached to natural resource wealth as follows: "I call petroleum the devil's excrement. It brings trouble...waste, corruption, consumption, our public services falling apart. And debt, debt we shall have for years." While he primarily referred to oil, the amalgam of evidence and experience suggests that other forms of natural resource wealth risk bringing about similar debilitating dependence that runs contrary to human and economic development and undermines child rights.

The extraction of natural resources such as mineral and hydrocarbon deposits has become a large (and for many still growing) part of developing countries' economies. These industries have the potential to generate significant amounts of hard currency for developing countries wealth that could be used to boost investments in support of social and economic development. However, the track record of countries with major extractive industries is mixed. Rather than serve as a boon to development, natural resources are often characterized as a curse.<sup>1</sup> Countries like Angola, Chad, Democratic Republic of Congo and Venezuela, for example, are among the countries that have faced various symptoms of the natural resource curse such as vulnerability to boom-bust episodes and wild swings in public spending and investments (i.e. spending bonanzas during times when the price of commodities are favorable, and crushing debt and severe fiscal austerity during commodity price downturns). Slower growth, higher corruption and more prevalent conflicts also form part of the broader malaise for these countries.

Nevertheless, some developing countries are on the opposite side of the spectrum, where natural resource wealth can be characterized as a blessing. Botswana, Chile and Malaysia, are widely touted as examples of those natural resource exporters that effectively channelled their wealth towards investments in economic and human development, boosting education and health of the population while also improving economic diversification and competitiveness. A synthesis of these experiences, coupled with the amalgam of empirical evidence to date would suggest that natural resource wealth is a double-edged sword. Indeed this wealth could fuel rapid and inclusive development, or it could stifle economic diversification, and breed dependence, corruption and social and macroeconomic vulnerability.

<sup>&</sup>lt;sup>1</sup> See among others Humphreys, Sachs and Stiglitz (2007) and Frankel (2010).

Thanks to improvements in technology and strong global demand among other factors, natural resources are being explored and will soon be extracted in ever increasing volumes in a growing number of least developed and lower middle income countries, including Cambodia, Ghana, Papua New Guinea, Sierra Leone, South Sudan, Timor Leste, Mongolia and Uganda. These are among a growing cohort of countries that will ramp up their natural resource exports while their starting points are characterized by relatively less advanced human development, governance, and economic diversification. Their vulnerability to the natural resource curse is therefore seen to be much more acute, when compared to countries that already had some level of development and somewhat stronger institutions for good governance prior to the development of their extractive industries. Their potential for rapid human and economic development and advancing child rights is also much larger.

Can these countries avoid the natural resource curse, and chart a path towards sustained growth and development? The evidence points to an affirmative answer, even as the risks are considerably large. The goal of this paper is to synthesize how to mitigate these risks, and to present the main lessons behind tapping natural resource wealth more effectively for human and economic development and advancing child rights. These lessons include policy and institutional innovations that manage natural resource wealth more effectively, as well as investment patterns that boost human capital—including investments in child education and health—and promote more inclusive growth and enhance competitiveness at the same time.

In what follows, section 2 briefly summarizes the global and Asian landscape of selected extractive industries. Section 3 then reviews the amalgam of evidence tracing the links between extractive industries and human and economic development as well as child rights. Finally, a concluding section synthesizes the main lessons and possible innovations that could inform natural resource wealth management for low income countries such as the three analyzed here.

### 2. SNAPSHOT OF EXTRACTIVE INDUSTRIES: RISING ROLE OF DEVELOPING ASIA

The US Energy Information Agency (2010) projects that world marketed energy consumption will grow by about 49 percent between 2007 and 2035.<sup>2</sup> Developing countries are going to account for the lion's share of this rise in energy consumption—energy consumption in the developing world is expected to rise by 84 percent, compared to a mere 14 percent increase in energy use among the countries that form the Organization for Economic Cooperation and Development (OECD). Economic growth in the developing world will both help fuel, as well as be driven by, extractive industries and energy production. GDP in purchasing power parity terms is expected to increase by 4.4 percent per year on average in the developing world, compared to a mere 2 percent per year for OECD countries during the period analyzed (see Figures 1-3).

As for minerals, improvements in technology and the continued investments in exploration are both expected to drive supply upwards in order to meet growing projected demand (Wilburn 2004). Mineral exploration spending has increased from about \$3.5 billion in the 1950s, rising to \$12 billion in the 1970s and further increasing to \$28 billion in the 1990s. While figures on mineral exploration for the 2000s are not yet available, improvements in technology combined with the exhaustion of near-surface deposits of different minerals and hydrocarbons is widely expected to open new frontiers of exploration, including deep undersea sources (Doggett 2007:63). The world's top ore and mineral exporters now include relative newcomers like Mongolia and Papua New Guinea (see Figure 4).

The Asian region plays an important role as both supplier and consumer of natural resources. As a supplier, Asia (and in particular countries like Australia, China and Indonesia) dominate the world market in most of the mined minerals (US Geological Survey 2009 b:1-2; see also Annex 1). As a consumer, growth in Asia, coupled with burgeoning young populations in several countries will fuel robust demand for energy and minerals. For instance, in terms of copper consumption, urbanization and industrialization in Asia—and notably China—is expected

<sup>&</sup>lt;sup>2</sup> World marketed energy consumption is expected to increase from 495 quadrillion British thermal units (Btu) in 2007 to 590 quadrillion Btu in 2020, rising even further to 739 quadrillion Btu by 2035. These forecasts are based on the IEO reference scenario which does not consider prospective policies and legislation pertaining to extractive industries. These forecasts also focus primarily on market energy sources, and these do not yet consider the implications of continued financial and economic volatility in several industrial countries. Nevertheless the figures are illustrative of broader trends that point to the rising role of the developing world as both consumers and producers of natural resources. Unless otherwise stated, the figures are drawn from US Energy Information Agency (2010: 9-11).

to drive a further 40% growth in demand by 2020. China alone consumes anywhere from 40-50% of global copper output based on industry estimates (Economist 2011).



Figure 1. World Energy Consumption, 1990-2035.



Figure 2. Non-OECD Energy Consumption, 1990-2035.

Source: US Energy Information Agency (2011).



Figure 3. World's Top 50 Fuel Exporters (% of Merchandise Exports), 2009

Source: World Bank World Development Indicators Online.



Figure 4. World's Top 50 Ore and Metals Exporters (% of Merchandise Exports), 2009

Source: World Bank World Development Indicators Online.

(In 1000 metric tons unless other wise specifica)									
Alumina		Bauxite		Copper		Iron Ore		Nickel	
China	23800	Australia	65231	China	970	China	880000	Indonesia	203
Australia	19948	China	40000	Australia	859	Australia	394000	Australia	165
India	3100	India	14000	Indonesia	610	India	245000	Philippines	137
Japan	310	Indonesia	1200	Papua NG	167	Korea, N	5300	New Cal.	93
		Malaysia	263	Mongolia	130	Malaysia	1470	China	81
		Vietnam	80	Philippines	49	Thailand	1401		
		Pakistan	37	India	31	Mongolia	1380		
				Pakistan	19	Vietnam	1060		
				Korea, N	12	Korea, Rep	455		
				Vietnam	12	Pakistan	260		
Asia (share)	100		100		100		100		100
World (share)	60		61		19		66		43

Table 1a. Top Natural Resource Producers in Asia, 2009(In 1000 metric tons unless otherwise specified)

Source: USGS (2009).

Table 1b. Top Natural Resource Producers in Asia, 200	9
(In 1000 metric tons unless otherwise specified)	

Tin (metric tons)		Zinc (metric tons)	)	Coal (Bituminous)		Natural Gas (million cubic	e meters)	Petroleum (1000 42-gal	barrels)
China	115000	China	3400000	China	2300000	Indonesia	80000	China	1370000
Indonesia	55000	Australia	1290000	India	450000	China	72000	Indonesia	280000
Australia	13269	India	365000	Australia	348000	Malaysia	58560	India	255000
Vietnam	5400	Mongolia	156500	Indonesia	190000	Australia	42345	Malaysia	240843
Malaysia	2412	Korea, N	70000	Mongolia	13164	Pakistan	39000	Australia	169211
Burma	672	Vietnam	45600	Philippines	4687	India	30000	Vietnam	119528
Laos	350	Thailand	34000	New Zeal.	4563	Thailand	26362	Brunei	61000
Thailand	153	Philippines	10035	Pakistan	3600	Bangladesh	19000	Thailand	56302
		Pakistan	5000	Japan	1100	Burma	11555	Pakistan	27000
		Laos	3400	Malaysia	1050	Brunei	11300	New Zeal.	19617
		Burma	45	Afghanistan	150	Vietnam	8010	Papua NG	12806
				Bhutan	124	New Zeal.	4097	Burma	6881
				Nepal	16	Japan	3700	Japan	5795
						Taiwan	310	Philippines	2920
						Papua NG	100	Mongolia	1870
						Afghanistan	50	Bangladesh	1800
								Taiwan	101
								Afghanistan	20
Asia (share)	100		100		100		100		100
World (share)	70		48		65		14		10

Source: USGS (2009).

The above-mentioned statistics provide a brief overview of how extractive industries have become a significant portion of developing countries' economies as well as of global trade. Clearly the major caveat here is the continued uncertainty and volatility in international economic prospects. However, these figures and projections do reflect expected significant increases in global energy and mineral consumption and production. Developing countries will play a key role on both sides of this equation—and in particular, a growing number of less developed countries in Asia will begin to feature prominently on the supply side. These countries could draw on the lessons, experiences and policy innovations of other countries that have tried to minimize the risks of the natural resource curse while seeking to maximize their associated development benefits.

#### **3. REVIEW OF EVIDENCE ON EXTRACTIVE INDUSTRIES AND DEVELOPMENT**

Case studies and multi-country empirical analyses paint a mixed picture as far as the general link between extractive industries and human development, and extractive industries and child rights.<sup>3</sup> On the one hand this relates to the significant risks faced by countries who wish to tap this wealth for development—indeed only a few countries seem to have managed to do this effectively. On the other hand, the mixed results also suggest that the natural resource curse is not necessarily unavoidable. Indeed a number of countries that have taken important steps to improve the governance of their wealth as well as channel these toward productive investments—notably human capital—appear to have transformed the natural resource curse into a boon for development.

Empirical and case studies of the links between extractive industries and development outcomes identify at least two main channels of interest (e.g. Humphreys, Sachs and Stiglitz 2007; Frankel 2010; Collier and Venables 2011):

 a) Public Goods: How does natural resource wealth support stronger government revenues, and in turn enhanced public sector investments to boost development? and,

<sup>&</sup>lt;sup>3</sup> Various lenses could be used to try and evaluate the development impact of extractive industries, including but not limited to economic development (e.g. growth of output industrial diversification, employment generation and productivity), social and human development (e.g. freedom from deprivation), environmental sustainability (e.g. preservation of other natural resources) and child and human rights. Clearly all are linked and this paper draws on these various perspectives.

b) Private Consumption and Investments: How does natural resource wealth contribute to high and inclusive growth that boosts employment and livelihoods, in turn increasing household incomes and private/household consumption and investments to children and the general wellbeing of the family?

Sachs and Warner (1995), for example, examined data for about 70 countries during the period 1970-1990; and they found evidence that economies with a high ratio of natural resource exports to GDP in 1970 (the base year) tended to grow slowly during the subsequent 20-year period 1970-1990. This slower growth could translate to weaker public sector revenues and thus also more constraints to public investments in human capital. Similarly, this may also translate to slower growth in household income, in turn resulting in lower household consumption and investment for the benefit of children. Nevertheless, evidence on these two main channels affecting human development and child rights appears inconclusive.

Hinojosa et al (2010) combine correlation, regression, and cluster analysis of data on about 74 countries in which the level of export dependence on minerals (fuel and metals) has been superior to 10 per cent in the period 1995–2005. These authors find little evidence of a definitive link across mineral wealth, state revenue and social welfare policy. As regards social sector and human development outcomes, Pineda and Rodriguez (2010) undertake multi-country regression analysis, and they uncover evidence that changes in human development from 1970 to 2005 are positively and significantly correlated with natural resource abundance. This suggests that the extractive industries sector could contribute to human development and advancing child rights.

In terms of the potential for poverty reduction and reduced inequality, Segal (2011) helps to illustrate a "resource dividend" policy, which is essentially a redistribution of the share of the natural resource rent.<sup>4</sup> Analyzing data for 17 developing countries with populations larger than 50 million, he finds that if every developing country in his sample implemented a redistribution of some of this natural resource wealth, then the number of people living below \$1-a-day could be cut by between 27 and 66 percent (Ibid:19). Using India as a specific illustration, Segal further notes that a resource dividend scheme could cut poverty by more than half in that country, from 42% to 18% (Ibid:24).

<sup>&</sup>lt;sup>4</sup> Rents are approximated as the price minus average extraction cost times the quantity extracted. This calculation provides a rough guesstimate, even as it has limitations (e.g. the costs of extraction are not factored in).

Country case studies also provide further insights as to how some countries have managed the risks posed by extractive industries. In a recent volume by Collier and Venables (2011), for example, analyses of extractive industries in Russia, Iran, Malaysia, Chile, Cameroon, Nigeria, Kazakhstan and Zambia reveal how economic growth and human development through natural resource wealth is essentially a challenge of avoiding the "weakest link" in a chain that connects natural resources with development outcomes. The first link in this chain focuses on the discovery and development of natural resource wealth, which requires not just investments in public goods (mineral surveys and clear property rights regimes) but also large capital and technology investments for extraction. A second link has to do with the government effectively assessing and channelling that wealth through its public finance management system. A final link focuses on investing that wealth in ways that strengthen assets and capital for high and inclusive growth and development. As far as policy experience goes, this will typically involve strong human capital investments as well as industrial diversification that absorb and utilize these investments effectively. Each of these links risks being broken not just by poor governance, but also by a variety of challenges linked to the natural resource curse.

Drawing on the literature, the following are some of the main symptoms of the natural resource curse:

- *Dutch disease*. A sudden and strong inflow of hard currency could lead to strong appreciation pressure on the domestic currency. In particular, this is a risk for countries that maintain some form of managed or fixed exchange rate regimes.
- *Crowding out of manufacturing*. Linked to Dutch disease, a stronger currency essentially takes out one important policy tool for industrialization policy, i.e. an undervalued exchange rate. In addition, the development of extractive industries could also introduce risk and volatility, as noted earlier, and this in turn could serve as a severe disincentive for the rest of the economy to diversify and develop.<sup>5</sup>

<sup>&</sup>lt;sup>5</sup> Boom-bust cycles are anathema to high and inclusive growth by: a) destabilizing social sector spending and investments; b) introducing volatility in household incomes and exposing more vulnerable parts of the population to risk; c) creating disincentives for investment due to uncertainty and higher risk. For a discussion of specific country experiences, see for example Hausmann (2003) on Venezuela, Akaiye, Collier and Ekpo (2011) and Perry et al (2011) on Nigeria, Adam and Simpasa (2011) on Zambia, Perry et al (2011) on Colombia and Gauthier and Zeufack (2011) on Cameroon. In addition, Cavalcanti and others (2012) undertake a multi-country empirical analysis which reveals that economic volatility due to commodity boom and bust patterns is negatively associated with physical capital accumulation and factor productivity.

- *Poor governance and weak institutions*. Countries with governments that maintain strong control over natural resource deposits or with elites that maintain their hereditary grip on this wealth may be less likely to develop strong institutions for good governance and well functioning market economies.<sup>6</sup>
- *Crowding out of human capital investments.* The two preceding factors could lead to weak public and private sector investments in children and youth, due in part to weaker household incomes as well as unresponsive and bad governance. This in turn could lead to even weaker long term economic and human development prospects, possibly introducing a low level development trap.<sup>7</sup>
- Unsustainability and conflict. Weak and inequitable access to basic needs such as education, health and some social protection, as well as unresolved disputes in the appropriation and management of natural resource wealth, combined with bad governance and unaccountable governments, could eventually lead to unsustainable depletion of this wealth (as well as the surrounding environment) as well as trigger conflict among the different stakeholders.
- *Economic volatility*. Over-dependence on extractive industries could open channels for external shocks coming from volatility in international markets. This, in turn, could create a further knock-on effect to the rest of the economy that may not be able to develop and diversify due to strong disincentives to invest.
- *Potentially deteriorating trends in world commodity prices*. While there is less evidence of this for most minerals and hydrocarbons, this is still a concern for commodity exports in the agricultural sector.

These symptoms of the natural resource curse have played out in varying degrees across different countries that boosted their natural resource exports. Cameroon, for example, has little to show for the vast amounts of oil wealth that has been extracted out of that country. Recent

<sup>&</sup>lt;sup>6</sup> The literature suggests that natural resource dependence could be associated with corruption and poor governance (e.g. Leite and Wedimann, 1999; Gylfason and Zoega, 2002). Some analysts contend that countries with already good institutions will be able to more effectively leverage natural resource wealth for development (Collier and Goderis, 2009; Robinson, Torvik and Verdier, 2006). In addition, Aleexeev and Conrad (2009) find little empirical evidence that that oil or mineral wealth interacts positively with institutional quality.

<sup>&</sup>lt;sup>7</sup> In particular, public spending on human development could suffer from: a) lower allocations and poorly timed cuts during crisis periods; b) mis- and inefficient targeting that ends up benefiting more those who need these less; and c) high leakages due to corruption and other factors. For a discussion in the context of social budgeting, see for example Mendoza (2011).

analysis by Gauthier and Zeufack (2011:27) show that up to 54% of the total oil rent in that country has not been transferred to the public sector budget and remains unaccounted for. Even as it boosted the extraction of oil since the late 1970s, that country saw its infant mortality increase from 61 to 78 per 1000 children, child malnutrition increase 14% to 22%, and life expectancy decrease from 56 to 50 years during its boom period (Ibid:29).

In addition, countries like Algeria, Angola, Azerbaijan, Myanmar (Burma), Cambodia, Chad, Congo-Brazzaville, Democratic Republic of Congo, Equatorial Guinea, Gabon, Kazakhstan, Nigeria, Sudan and Venezuela are among those that have seen conflict risks intensify alongside the development and extraction of natural resource wealth. Nigeria, in particular, has experienced severe conflict that is linked in part to natural resource management issues. The Niger Delta which contains vast amounts of natural resource wealth has also been the scene of ethnic unrest and conflicts especially in the late 1990s and early 2000s. During a particularly volatile period in the mid-1990s, analysts point out that the conflict led to severe human cost: about 30 villages were razed by soldiers, 2000 civilians killed and about 100,000 refugees displaced (Ajakaiye, Collier, and Ekpo 2011:236).

Yet examples of countries where some of these risks have been successfully mitigated do abound. Corporate social responsibility (CSR) initiatives by various mining companies have helped to shore-up some of the potential conflict risks, notably among communities that are affected by mining operations. Sagittarius Mines Incorporated in the Philippines, for example, has invested in technical and vocational education for affected communities, training on heavy equipment operation and management (in anticipation of mining employment opportunities), feeding program for vulnerable members of the community, health professionals training program programs, and subsidies on health insurance for community members.<sup>8</sup>

In addition, Malaysia invested heavily in policies that promoted stronger human development outcomes and improved equity. It reduced poverty from 50% of its population in 1970 to a mere 4% by 2007 while boosting its oil and other natural resource production. That country was able to diversify its economy thanks to strong investments in research and development that served as public goods for domestic industries (Yusof 2011:188; see Figure 5).

<sup>&</sup>lt;sup>8</sup> The issues surrounding CSR may include sustainability, coherence of CSR initiatives with more general development objectives, and the sense of fairness (given that voluntary CSR initiatives may vary in their scale, scope and modality in different jurisdictions, even when dealing with the same company). See APEC (2011) for a review of corporate social responsibility (CSR) initiatives of 10 mining companies in Asia.

Malaysia's growth and development trajectory was also anchored on a sound and stable business and investment regulatory regime (to encourage private sector investments); and public sector investments toward equity, which included policies to enable young people to participate in the subsequent economic transformation that relied on higher levels of skills, and policies to directly redistribute part of their growing wealth to the vast majority of the population.<sup>9</sup>

On the other hand, Chile has found it much more difficult to diversify, and still maintains a high dependence on commodity exports (see Figure 6). Today it is the largest producer of copper in the world, accounting for some 43% of the world total copper output (Fuentes 2011:82). Despite this vulnerability to external shocks, it has found a way to mitigate the risks attached to this economic structure by creating financing mechanisms like the Economic and Social Stabilization Fund (formerly the Copper Stabilization Fund) that enable it to implement countercyclical fiscal policies. Further, Chile channelled part of its mineral royalties into a Fund for Innovation for Competitiveness managed by the Ministry of Economics. It also created a National Council for Innovation for Competitiveness whose role has been to advise the government on human capital development, creation and dissemination of technology and broader innovation policies.

<sup>&</sup>lt;sup>9</sup> These investment strategies that build on human capital, provide stable regulation and promote stronger equity appear common in many of the successful cases, even as the specific elements and approaches may vary. For a discussion of different countries' experiences, and in addition to Yusof (2007) on Malaysia, see for instance Rosser (2007) on Indonesia, and Iimi (2006) on Botswana. In addition, Meller and Simpasa (2011) discusses the divergent experiences of Chile and Zambia, two of the developing world's major copper exporters. These countries' respective (and partly divergent) strategies to involve the private sector played a key role in how stable and competitive their natural resource export industries have turned out.



Source: World Bank World Development Indicators Online.



Figure 6. Chile's Export Industries (%GDP)

Source: World Bank World Development Indicators Online.

Financing mechanisms have been created with varying objectives related to improving the management of natural resource wealth. To help preserve the wealth for future generations and improve the sustainability of its use, some countries have created savings funds along with rules that govern the amounts and conditions for withdrawal. For instance, the so-called "Hartwick rule" limits withdrawals to the return on the investment of the fund while keeping the fund balance constant in real terms. However, some have questioned an overly conservative use of natural resource wealth, citing that present consumption should be given greater weight, notably in less developed countries with high scope for up-front investments in human and economic development. Essentially, these analysts argue that, rather than bequeath proceeds from natural resource wealth, present generations can build a more diversified economy and a society with higher human development for future generations (Heuty and Aristi 2011; Van der Ploeg and Venables 2011).

In addition, investment rules have also been adapted to recognize the importance of human capital in countries' sustainable and effective use of their natural wealth (e.g. Botswana's Pula Fund). Finally, stabilization funds have also been created in order to help provide resources during difficult economic times, in anticipation of the boom-bust tendency of extractivesdependent economies. Chile, for example, has an Economic and Social Stabilization Fund that helped provide part of the resources to implement countercyclical social spending during the recent global economic downturn. Other countries with smaller populations and larger natural resource wealth are able to provide more generous public goods, such as free education and healthcare in Brunei.

Table 2 outlines some of the funds created to manage natural resource wealth, and it lists some of the ways through which these funds boost investments in children and human development.<sup>10</sup>

<sup>&</sup>lt;sup>10</sup> Sovereign wealth funds are to be distinguished from other types of funds, trusts and foundations which may also be financed through natural resource wealth. In practice, financing mechanisms to manage natural resource wealth are myriad and a variety of models are used to try to adapt to the context of the country, community, and industry among other factors. See Wall and Peron (2011) for further elaboration on the key attributes of foundations, trusts and funds.

Country	Fund Name	Date Est.	Assets (\$billions)	Fund Type	Modes of Distribution	Impact on Soc. Development & children	Trans- parency Score <sup>11</sup>	Source of Revenue
Botswana	Pula Fund	1994	6.9	Savings	The fund is part of the foreign exchange reserves. Its goal of preserving a portion of the income for future generations.	Investment rule recognizes investments in human capital as part of "sustainable investment/spending"	6	diamonds & minerals
Brunei	Brunei Investment Agency	1983	30	Savings	Earnings produced from the oil industry are utilized to build up foreign reserves.	The fund helps to finance free education and health care provided by the government	1	oil
Chile	Social & Economic Stabilization Fund	1985	21.8	Stabilization Savings	The aim of the Pension Reserve Fund is to address an expected future government pension liability shortfall. As a Savings Fund, it enables a transfer of wealth from one generation to the next for the purpose of future sustainability.	In 2009, 14.5% growth in public spending despite fiscal revenues falling by 23%; Direct transfer to low income families of around \$80 each during the crisis.	10	copper
Kiribati	Revenue Equalization Reserve Fund	1956	0.4	Stabilization	The fund is part of the government's assets and contained more than U.S. \$500 million in 2009.		1	phosphates
Mauritania	National Fund for Hydrocarbon Reserves	2006	0.3	Stabilization Savings	The fund plays the role of a macroeconomic stabilization for country. It has goal of accumulating savings for future generations.		1	oil & gas
Mongolia	Mongolia Human Health Fund	2013	30	Stabilization	SW Fund will come on line in 2013; Direct transfer cash /non-cash securities to 2.7 million citizens plus central budget allocations for health and education	Special monthly direct cash transfers to all citizens	n/a EITI	Copper and gold

# Table 2. Summary Descriptions of Selected Sovereign Wealth Funds

#### Table 2 Continued...

Country	Fund Name	Date Est.	Assets (\$billions)	Fund Type	Modes of Distribution	Impact on Soc. Development & children	Trans- parency	Source of Revenue
Papua New Guinea	PNG Mineral Resources Stabilization Fund	1974- 1999		Stabilization	The MRSF was designed as a fiscal tool to support macro-economic management of the national economy. The current government plans to create a new SWF	Special youth and children support grants to local governments & communities	n/a	Minerals , oil/natural gas
Qatar	Qatar Investment Authority	2005	85		The fund devoted to diversification using money from its energy sector to invest in non-energy related sectors. The QIA controls around \$75 billion in assets.		5	oil
Timor- Leste	Timor-Leste Petroleum Fund	2005	8.3	Stabilization Savings	The Fund is integrated into the State Budget. By law annual draw downs cannot exceed the Estimated Sustainable Income (ESI). The fund has built in requirements for transparency and accountability.	Currently funding overseas graduate education for 160 students, Central budget support for health and education	1 EITI	Oil and natural gas
Texas	Permanent School Fund	1895			The fund is used exclusively for the benefit of Texas Public Schools	Supports primary and secondary schools	N/A	Oil/gas and mineral royalty payments
Nigeria	Sovereign Investment Fund	2011	1	Savings stabilization	Funding mechanism for 2 funds: Future Generation Fund Infrastructure Fund Stabilization Fund	Supports human development and infrastructure investments	N/A	Oil revenues
Kuwait	Investment Authority	1953	296	Savings	Provides a source of reserve funding for Future Generation Fund		6	State transfers 10% of oil revenues annually to this fund
Bahrain	Taskeen Investment Board	2007		Savings	Funding mechanism to support investments in job creation	Targets creation of 20,000 jobs	N/A	Oil revenues

Sources: http://www.swfinstitute.org/fund-rankings/swfs/; http://www.swfinstitute.org/tag/mongolia/; http://www.swfinstitute.org/swfs/brunei-investment-agency; http://www.swfinstitute.org/fund/chile.php; http://www.state.gov/r/pa/ei/bgn/1836.htm; http://www.swfinstitute.org/fund/mauritania.php; http://epress.anu.edu.au/ssgm/global\_gov/mobile\_devices/ch14s02.html; http://taighde.com/w/Qatar\_Investment\_Authority; http://www.swfinstitute.org/swfs/heritage-and-stabilization; http://www.laohamutuk.org/Bulletin/2007/Mar/bulletinv8n1.html Notes: <sup>1</sup>Linaburg-Maduell Transparency Index.

Furthermore, Save the Children (2003:3) estimates that extractive industries are critically important in over 50 developing countries which are home to about half of the global population. Of this group, about 1.5 billion people—including over 700 million children—live on less than \$2 a day. Based on their review of the policy choices and governance of natural resource wealth in countries like Azerbaijan, Colombia, Nigeria, Sudan, and Venezuela, they conclude that the net impact of extractive industries has become adverse, notably for children, particularly when governments mismanage the wealth and do little to mitigate both the initial as well as the subsequently exacerbated inequality that could result from natural resource extraction and non-inclusive growth. Poor regulation (as well as corruption at the central and local government levels) is associated with (sometimes illegal) artisanal mining, child labor, and subsequent harmful environmental repercussions.<sup>13</sup> In addition, bad governance and corruption is also associated with weaker or very unstable and volatile human capital investments and social spending. Typically the most vulnerable—poor households and children, as well as indigenous communities—are often severely affected.<sup>14</sup>

All these are critically linked to weak institutions. In response, a growing number of international development agencies and international civil society groups support improving transparency, publishing all payments and improving the development impact of business operations comprise some of the strategies that could improve the net positive impact of mineral wealth on children and poor families.<sup>15</sup> Box 1 contains a brief description of the successful transition of Botswana from a low-income and low human development trajectory to a country with high and inclusive growth and stronger promotion of child rights.

<sup>&</sup>lt;sup>13</sup> Artisanal and industrial mining interests are in conflict with each other in certain cases, notably when artisanal miners are crowded out by newly established large mining operations (e.g. Tanzania and Peru). For an analysis of perceptions of mining among affected communities, see the case studies of Chile, Ghana, Peru and Tanzania by the World Bank, UNCTAD and ICCM (2006).

<sup>&</sup>lt;sup>14</sup> On the child and gender impact of mining and extractive industries more broadly, see among others Ward (2010); Efitimie, Heller and Strongman (2009); ILO (2007) and ICCM (2006).

<sup>&</sup>lt;sup>15</sup> See for example the Extractive Industries Transparency Initiative which seeks to improve the governance of natural resource wealth management through initiatives to improve transparency and accountability in this process. See http://eiti.org/eiti/principles.

#### Box 1. Case of Botswana

Large diamond deposits were discovered in Botswana due in part to the conducive exploration and investor environment that its government put in place. Subsequent commercial extraction of minerals helped fuel the phenomenal growth in the country-turning Botswana into the fastest growing country (developing or otherwise) in the last 35 years. Much of Botswana's natural resource wealth has been invested in public goods and services. Social spending accounts for about 30-40 percent of total public spending (average growth of about 11% a year in real terms. Botswana's children have benefited immensely: 99% of births are now attended by skilled health staff; 97% of one-year-olds are fully immunized against tuberculosis. The country also has the highest public spending on education in the world (in % of GNP). [...] It spent approximately \$US 77 per capita on public health in 1998. Improvements to under 5 mortality have been spectacular, falling from 13.9 per cent in 1970 to 4.8 per cent in 1998. Transparency in managing the wealth is part of Botswana's success. Transparency International's 2003 Global Corruption Report credited Botswana as the most transparent country in Africa. Save the Children notes that "Transparency in tax and royalty receipts has put the onus on the government to widen the circle of beneficiaries beyond public officials, politicians and the diamond industry's narrow employment base."

Sources: Acemoglu, Johnson and Robinson (2003), limi (2006) and Save the Children (2003:9).

Botswana is among a number of countries that face demographic transitions characterized by a large young population. Youth, defined as those aged 15-24 and expressed as a share of the total national population, is presently peaking in numerous low income and lower middle income countries, including Maldives, Zimbabwe, Swaziland, Iran, Grenada and Cambodia. If one defines a youth bulge as a peak in the share of youth in the total national population, then about 71, mostly low and lower middle income developing countries are undergoing or are anticipating a youth bulge (see Annexes 2 and 3). Several billion children in multiple cohorts underpin these demographic transitions (Mendoza, Murthy, and Komarecki 2010:2).

In these countries (and regardless of their natural resource wealth) investments in human capital should therefore also be associated with broader policies to generate robust and inclusive livelihoods and employment growth. Most developing countries will need to augment domestic resources with foreign capital and investments. However, for those countries with natural resource wealth, there are opportunities to generate enough resources to be able to invest in their young populations in ways that also cohere with economic diversification away from dependence on extractive industries.

#### 4. SYNTHESIS OF KEY LESSONS IN MANAGING NATURAL RESOURCE WEALTH

The foregoing suggests that extractive industries could introduce risks associated with the socalled "natural resource curse." These challenges include the crowding out of manufacturing and other non-extractive industries as well as the crowding out of social spending and human capital investments. These two combined can already stifle the main channels through which any growth can become inclusive in its benefits. Experience and evidence suggests it is possible to mitigate these and other risks through different policy innovations and strategies that transform the natural resource wealth from being a curse to a blessing for development. Figure 7 synthesizes the preceding review of literature and policy experience by outlining the risks attached to the natural resource curse and the associated solution to these, as demonstrated by policy experience.

First, countries with natural resource wealth could try to mitigate the adverse impact (and perhaps mitigate the risk as well) of volatility and crises by channelling some of their wealth into funds that help stabilize public sector spending and investments, as well as by implementing fiscal rules that prevent boom-bust cycles in public sector spending (e.g. Chile's Economic and Social Stabilization Fund). One proposal for an "inclusive growth trust fund" in the Philippines, for example, could be premised on a more balanced and transparent calculation and sharing of net benefits between the local community, the mining companies, and the central and local governments (in the interest of national and regional public good investments), thus carving space for a "middle ground" in the way extractive industries are addressed. Such a fund could also more effectively and accountably channel the natural resource wealth into agreed-upon public investments that seek to maximize social returns related to poverty reduction, protecting the environment (where the country may choose not to mine due to the unique environmental wealth in some areas), mitigating the environmental costs of mining operations (notably when mines cease operations and the community needs to resuscitate the domestic non-mining economy and undertake environmental clean-up), and promoting stronger economic competitiveness and industrial diversification (notably in the non-mining sector). Such a fund could also reflect the broader priority to enhance good governance in public resources, through

professional management and strong accountability mechanisms that espouse good practices in public finance management (see Mendoza 2011, and the annex to this paper).

Second, crowding out of manufacturing and the exchange rate appreciation pressure associated with Dutch disease could be counteracted by more proactive industrial policies (including appropriate exchange rate management) as well as investments in public goods (e.g. research and development) that enhance the chances for successful economic diversification (e.g. diversification strategies of Chile, Indonesia and Malaysia). This may also contribute to a more inclusive growth pattern through more robust livelihoods and job creation. External orientation through exports (and in some countries channelling some of the natural resource wealth toward external investment opportunities) could also introduce some discipline on domestic industries through competitive market forces at the international level.<sup>16</sup>

Third, unsustainability could be addressed by following the necessary savings strategy which may include the creation of specially designed savings funds (e.g. Botswana's Pula Fund). The governance of the use of these funds could reflect a variety of rules, including those that require intergenerational equity in the use of the funds. However, there are also alternative views on this angle, such as frontloading human capital investments given high initial human development gaps (and thus returns on investing in this area). In addition, there is also a timing mismatch regarding the flow of funds and the potential environmental rehabilitation and clean-up after mining operations close down (APEC 2011).

Fourth, the risk of developing poor institutions and conflict could be mitigated by policies that prioritize social stability and that promote stronger equity. This requires striking a balance and achieving some level of fairness between the national and local, as well as intergenerational benefits from natural resource wealth. A variety of strategies may be explored here, including targeted redistribution schemes (e.g. transfers targeted at marginalized groups). In addition, some analysts have proposed approaches that directly redistribute resource wealth universally to all citizens, and then taxing part of this back through a progressive tax system in order to achieve equity goals. The crux of this proposal is to try and strengthen the citizen-state linkage through a

<sup>&</sup>lt;sup>16</sup> Malaysia's state oil company channeled part of the country's natural resource wealth toward foreign investments that required the company to remain competitive at the international level.

public finance system that is further strengthened by taxpaying citizens (instead of rentier states that draw their resources from natural resource contracts with corporations).<sup>17</sup>





Source: Authors' elaboration.

In addition to the national perspective taken by these redistribution issues, issues of fairness across and within mining jurisdictions are also a typical challenge. It is often the case that a mine's social license to operate is at risk because of negative public perceptions (warranted or not) regarding its net contribution to development, both local and national. One possible way this could be addressed based is through a combined approach that involves both the public and private sectors in partnership to strengthen public goods provision—including environmental protection and restoration of mining sites. Investments by mining companies to help strengthen local communities' education, health, environmental protection and other public goods will most

<sup>&</sup>lt;sup>17</sup> This proposal presumes that countries' tax regimes are serviceable; and the goal is to channel wealth through this system in order to help strengthen it (rather than divert wealth through parallel systems). For a discussion, see the proposal for an Oil2Cash wealth distribution scheme by Moss (2011) and the proposal for an Oil Redistribution Fund for Iraq by Palley (2003).

surely help shore-up their reputations with local communities, and so most mining companies see these activities as necessary investments to help secure the social license to mine.

Finally, a fifth and perhaps critically important aspect has to do with the crowding out of public goods, social spending and human capital investments in countries that have not managed their natural resource wealth effectively and equitably. Mitigating this risk requires clear human capital investment strategies backed up by adequate resources (and tied to the management of the funds created for these) and in consonance with an industrial diversification strategy that allows for livelihood and employment opportunities notably for youth in burgeoning populations in the developing world.

### References

- Acemoglu, D., S.Johnson and J.Robinson, 2003. "An African Success Story: Botswana." In Dani Rodrik, Ed., *In Search of Prosperity: Analytical Narratives on Economic Growth*. Princeton: Princeton University Press.
- Adam, C. and A.Simpasa. 2011. "Copper mining in Zambia: From collapse to recovery." In P.Collier and A.Venables, Eds., *Plundered Nations? Successes and Failures in Natural Resource Extraction.* Basingstoke: Palgrave MacMillan.
- ADB. 2011. Mongolia-Key Indicators for Asia and the Pacific 2011. [Available at: http://beta.adb.org/key-indicators/2011/main].
- Ajakaiye, O., P.Collier and A.Ekpo. 2011. "Management of Resource Revenue: Nigeria." In P.Collier and A.Venables, Eds., *Plundered Nations? Successes and Failures in Natural Resource Extraction.* Basingstoke: Palgrave MacMillan.
- Alexeev, M. and R.Conrad. 2009. "The Elusive Curse of Oil." *Review of Economics and Statistics* 91(3):586-98.
- APEC. 2011. "CSR in the APEC Mining Sector." Manila. [Available at: http://publications.apec.org/publication-detail.php?pub\_id=1167].
- Baker & McKenzie. 2009. "Mongolian Mining Law Brief." [Available at: http://www.taalobakernet.com/e/areas\_of\_practice/practice\_group/pdf/20090624.pdf].
- Barrick Gold Corporation. 2011 Feb. "Statement by Barrick Gold Corporation in Response to Human Rights Watch Report." [Available at: http://www.barrick.com/CorporateResponsibility/KeyTopics/PorgeraJV/Response-to-Human-Rights-Watch-Report/default.aspx].
- Cavalcanti, T., K.Mohaddes and M.Raissi. 2012. "Commodity Price Volatility and Sources of Growth." IMF Working Paper 12/12. Washington, D.C.:IMF.
- Centre for Human Rights and Development. 2006. "Discussion Paper for the National Dialogue: "Mining and Human Rights in Mongolia"." [Available at: http://www.rimmrights.org/Documents/final%20discussion%20paper%20amended%20C HRD%20(i).pdf].
- Centre for Policy Research and Population Training and Research Centre. 2009, September. "Oyu Tolgoi Project Socio-economic Impact Assessment—Final report." [Available at: http://www.ot.mn/resource/file/2010/1/47d5d8cca9eb48f2/a17cd3a8f779678c.pdf].

- Davaasambun, D, 2003. Mineral development in Mongolia: The government perspective. Paper presented at CERCAMS-III "Mongolia Exploration Workshop", London: 19-20 May 2003. Geodynamics and Metallogeny of Mongolia with a special emphasis on Cu-Au porphyry systems
- Christmann, Patrice and Nicolas Stolojan. 2008. "Management and Distribution of Mineral Revenue in PNG: Facts and Findings from the Sysmin Preparatory Study A Consultant's Perspective." [Available at: http://pubs.iied.org/pdfs/G00546.pdf].
- Collier, P. and B.Goderis. 2009. "Commodity Prices, Growth, and the Natural Resource Curse: Reconciling a Conundrum." Centre for the Study of African Economies Working Paper Series 274. [Available at: http://users.ox.ac.uk/~econpco/research/pdfs/CommodityPricesGrowthV1-1.pdf].
- Collier, P.and A.J.Venables. 2011. Plundered Nations? Successes and Failures in Natural Resource Extraction. Basingstoke: Palgrave MacMillan.
- Timor Leste Delegation. 2009. "Member Country Report of Timor Leste/East Timor, 1 July 2008 30 June 2009." CCOP (Coordinating Committee for Geoscience Programmes in East and Southeast Asia). Available at: [http://www.ccop.or.th/46as/46as\_Ag03-13\_TimorLeste.pdf].
- Doggett, M. 2007. "Global mineral exploration and production: The impact of technology." USGS. [http://pubs.usgs.gov/circ/2007/1294/reports/paper10.pdf].
- Doraisami, Anita. 2009. "Fiscal policy challenges in Timor Leste: is the resources curse on the horizon?" ASEAN Economic Bulletin. [Available at: http://findarticles.com/p/articles/mi\_hb020/is\_2\_26/ai\_n39172157/e].
- East-West Center Pacific Islands Development Program (PIDP) Pacific Islands Report, 2011 Aussie Mining Company on Trial for Bougainville War: Prosecution of Rio Tinto for 'genocide and war crimes' sets president, October 27.
- ECOS Magazine Towards a Sustainable Future 2005. Misima Mines Ltd. Responds to island gold mine concerns, Issue 125,Page 9 June-July, CSIRO Publishing, Collingwood, Victoria, Australia.

Economist. 2011. "Copper: Red Bull." The Economist 24 September 2011.

Efitimie. A., K.Heller and J.Strongman. 2009. "Gender Dimensions of the Extractive Industries: Mining for Equity." Washington, D.C.:World Bank. [Available at: http://siteresources.worldbank.org/INTEXTINDWOM/Resources/Mining\_for\_Equity\_Gender\_Dimensions\_of\_EI.pdf].

Engineers Against Poverty (EAP). 2011. Extractive Industries, January 11, 2011.

- Farrington, John D. 2005. "The Impact of Mining Activities on Mongolia's Protected Areas: A Status Report and Policy Recommendations." Integrated Environmental Assessment and Management, (1)3,283–289.
- Filer, Colin. 2006, May. "Pacific 2020 Background Paper: Mining and petroleum". [Available at: www.ausaid.gov.au/publications/pdf/background\_mining.pdf].
- Fitzpatrick, Phil. 2011. "Landowners and mining a chance to have your say." PNG Attitude, September 9, 2011.
- Fuentes, J.R. 2011. "Learning how to manage natural resource revenue: The experience of copper in Chile." In P.Collier and A.Venables, Eds., *Plundered Nations? Successes and Failures in Natural Resource Extraction*. Basingstoke: Palgrave MacMillan.
- Gandi, T., 2011. "Future Pension Fund-Social Security for Elderly" Presentation made by the Minister of Social Welfare and Labor at the UNDP on Avoiding the Resource Curse: Managing Extractive Industries for Human Development, Ulaanbaatar, Mongolia, 22-23 October.
- Gauthier, B. and A.Zeufack. 2011. "Governance and Oil Revenues in Cameroon." In P.Collier and A.Venables, Eds., *Plundered Nations? Successes and Failures in Natural Resource Extraction.* Basingstoke: Palgrave MacMillan.
- Government of Timor-Leste. 2011. "Timor-Leste Natural Resources What is being done with the oil, gas and the minerals that exist in the country." Interview with the Secretary of State Alfred Pires, March 30, 2011.
- Grayson, R. et al. 2004, November. "The People's Gold Rush in Mongolia—the Rise of the 'Ninja' Phenomenon." [Available at: http://www.mine.mn/WPJ4\_1\_Gold\_Rush\_in\_Mongolia.pdf].
- Gylfason, T. 2001. "Natural Resources, Education, and Economic Development". *European Economic Review*, 45, pp. 847-859.
- Gylfason, T. and G. Zoega. 2002. "Inequality and Economic Growth: Do Natural Resources Matter?" CESinfo Working Paper 712. [Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract\_id=316620].
- Hamilton, Kitty. 2011, July. "Mongolia mining success brings booming sex trade". [Available at: http://www.google.com/hostednews/afp/article/ALeqM5jM-b9cqWId4cXA-2ZcID5wKoa4xw?docId=CNG.4a1063b353feeb83042fbb1fa0c71853.2c1].
- Hancosk, Graeme. 2001. "Sustainability of Mining Impacted Communities in Papua New Guinea: Fiscal Revenue Sharing Mechanisms: Status and Practice." Power Point presentation at Workshop on Sustainability and Governance of Mining Revenue Sharing, 4-5 April 2001 (World Bank Mining Sector Technical Assistance Project).

- Hart Nurse LLT & Ulaanbaatar Audit Corporation LLC. 2010. "Mongolia Extractive Industries Transparency Initiative (MEITI) Third Reconciliation Paper 2008." [Available at: http://eiti.org/files/MEITI\_3rd%20RR\_ENG\_20100610\_FINAL%20%281%29.pdf].
- Hausmann, R. 2003. "Venezuela's Growth Implosion: A Neoclassical Story?" In Dani Rodrik, Ed., In Search of Prosperity: Analytical Narratives on Economic Growth. Princeton: Princeton University Press.
- Head, M. 2010, June. "Australia-East Timor conflict intensifies over Greater Sunrise gas project." [Available at: http://www.wsws.org/articles/2010/jun2010/timo-j09.shtml].
- Heuty, Antoine and Juan Aristi. 2011. "Boom, Bust and Better Policy: Crises Lessons for Resource Rich Countries. Fool's Gold: Assessing the Performance of Alternative Fiscal Instruments During the Commodities Boom and Global Crisis. Revenue Watch Institute. [Available at: http://archive-2011.revenuewatch.org/files/RWI\_Fools\_Gold\_Heuty\_Aristi\_FINAL.pdf].
- Hinojosa, L.,A.Bebbington, A.Barrientos and T.Addison. 2010. "Social Policy and State Revenues in Mineral-Rich Contexts." United Nations Research Institute for Social Development (UNRISD) Social Policy and Development Programme Paper 44. Geneva:UNRISD. [Available at: http://www.unrisd.org/80256B3C005BCCF9/search/D66D0265B0AE2C55C12577BD00 50710F?OpenDocument].
- Hodges. Anthony, et. al. 2007. "Child benefits and poverty reduction: Evidence from Mongolia's Child Money Programme." UNICEF Working Paper MGSoG/2007/WP002. [Available at: http://www.unicef.org/eapro/Child\_benefits\_in\_Mongolia.pdf].
- Human Rights Watch. 2010. "Gold's Costly Dividend: Human Rights Impacts of Papua New Guinea's Porgera Gold Mine." [Available at: http://www.hrw.org/sites/default/files/reports/png0211webwcover.pdf].
- Iimi, A. 2006. "Did Botswana Escape from the Resource Curse?" IMF Working Paper 06/138. Washington, D.C.: IMF. [Available at: http://www.imf.org/external/pubs/ft/wp/2006/wp06138.pdf].
- ILO-IPEC (International Labour Organization-International Programme on the Elimination of Child Labour). 2006, June. "Child labour in gold mining: The problem." [Available at: www.rimmrights.org/childmining/child\_labour\_in\_gold\_mining.htm].
- International Council on Mining and Minerals (ICCM). 2006. "Synthesis of Four Country Case Studies: The Challenge of Mineral Wealth: Using Resource Endowments to Foster Sustainable Development." The World Bank, UNCTAD Commodities Branch and ICCM.

- International Labor Organization (ILO). 2007. "Girls in mining: Research findings from Ghana, Niger, Peru and the United Republic of Tanzania." Geneva: ILO. [Available at: http://www.ilo.org/ipecinfo/product/viewProduct.do?productId=5304].
- International Monetary Fund. 2011, March. "IMF Country Report No 11/76." Washington, D.C.: IMF. [Available at: http://www.imf.org/external/pubs/ft/scr/2011/cr1176.pdf].
- Javia, I and P. Siop. 2010, May. "Paper on Challenges of Small scale Mining and Gender: Papua New Guinea." Wau Small Scale Mining Centre, PNG and SIDS-18 New York. [Available at: http://www.un.org/esa/dsd/resources/res\_pdfs/csd-18/10may/pm-SIDSday/presentation\_javia.pdf].
- La'o Hamutuk.2005, November. "Petroleum Dependency and Deficit Regime." *The La'o Hamutuk Bulletin* 6 (4). [Available at: http://www.laohamutuk.org/Bulletin/2005/Nov/bulletinv6n4.html].
- La'o Hamutuk.2007, March. "Timor-Leste's Petroleum Fund." *The La'o Hamutuk Bulletin* 8 (1). [Available at: http://www.laohamutuk.org/Bulletin/2007/Mar/bulletinv8n1.html].
- La'o Hamutuk.2008, Feb. "Sunrise LNG in Timor-Leste: Dreams, Realities and Challenges." [Available at: http://www.laohamutuk.org/Oil/LNG/LNGReportLoRes.pdf].
- Leite, C. and J.Weidman. 1999. "Does Mother Nature Corrupt?" IMF Working Paper 99/85. Washington, D.C.:IMF. [Available at: http://www.imf.org/external/pubs/ft/wp/1999/wp9985.pdf].
- Lemieux, Emilie, 2001 Peru: Challenges of Local Development in Mining Regions. Canadia Foundation for the Americas (FOCAL).
- Mendoza, R.U. 2011. "Crises and inequality: Lessons from the food fuel, financial and economic crises of 2008-2010." *Global Policy* 2(3):259-271.
- MAC (Mines and Communities). 2005, October. "Bougainville mine to re-open?" [Available at http://www.minesandcommunities.org/article.php?a=648].
- Mawuli, Agogo. 2011. "Optimising the use of budget windfall revenues." [Available at: www.nri.org.pg/publications/.../BWR\_%20CRC\_KW\_011110.pdf]
- MBendi. 2011. "Mining in Mongolia: Overview." Available at: http://www.mbendi.com/indy/ming/as/mn/p0005.htm].
- Meller, P. and A.Simpasa. 2011. "Role of copper in the Chilean and Zambian economies: Main economic and policy issues." Global Development Network Working Paper 43. [Available at: http://depot.gdnet.org/newkb/submissions/Copper\_Draft\_121809.pdf].

- Mendoza, R.U., S.Murthy and M.Komarecki. 2010. "When the Global Downturn hits the Youth Bulge: Challenges and Opportunities for (Female) Youth Employment and Social Advancement." Mimeo. Asian Institute of Management and UNICEF.
- Mendoza, R.U. 2011. "A Middle Ground on Mining" BusinessWorld, 7 June 2011.
- Miranda, M., et. al. 2009. "Mining and Critical Ecosystems: Mapping the Risks. Appendix 2: Environmental and Social Impacts of Mining." World Resources Institute.
- Mongolia EITI Multi-stakeholder working group. 2009, July. "Validation of the Extractive Industries Transparency Initiative in Mongolia, Terms of Reference for the Validator." [Available at: http://eitimongolia.mn/modules/news/files/20091217-123957\_file.pdf].
- Morrison, Judith. 2008. "Mining and Sustainable Development." Murdock University. [Available at: http://www.istp.murdoch.edu.au/ISTP/casestudies/Case\_Studies\_Asia/oktedi/oktedi.htm].
- Moss, T. 2011. 2011. "Oil to Cash: Fighting the Natural Resource Curse through Cash Transfers." Center for Global Development Working Paper 237. Washington, D.C. [Available at: http://www.cgdev.org/files/1424714\_file\_Oil2Cash\_primer\_FINAL.pdf].
- Munkhcimeg, D. 2011. "A budget of political promises." *The Ulaanbaatar Post* 24 October 2011.
- Palley, T. 2003. "Combating the natural resource curse with Citizen Redistribution Funds: Oil and the case for Iraq." Foreign Policy in Focus Special Report. [Available at: http://www.thomaspalley.com/docs/articles/economic\_development/natural\_resources\_cu rse.pdf].
- Perry, G., O.Ogunkola, M.Olivera and B.Fowowe. 2011. "Oil and institutions: 'Tale of two cities' Nigeria and Colombia." Global Development Network Working Paper 44. [Available at: http://depot.gdnet.org/newkb/submissions/Nigeria\_Colombia\_Oil\_WP44.pdf].
- Pineda, J. and F.Rodriguez. 2010. "Curse or blessing? Natural resources and human development."UNDP Human Development Research Paper 2010/04. New York: UNDP. [Available at: http://hdr.undp.org/en/reports/global/hdr2010/papers/HDRP\_2010\_04.pdf].
- Pires, R, 2011. Presentation by the Timor-Leste Minister of Finance at the UNDP Conference on Avoiding the Resource curse: Managing Extractive Industries for Human Development, Ulaanbaatar, Mongolia, 22-23 October.
- Portfolio Media. 2007. Energy Law 360. Mongolian Mining: A Golden Opportunity?" July 18 2007.

- PwC.2010. "Are you using change as an opportunity to grow?:2011 Papua New Guinea National Budget." [Available at: http://www.pwc.com/pg/en/budget-commentary/assets/2011\_PNG\_National\_Budget-PwC\_commentary.pdf].
- Revenue Watch Institute. 2010. "Timor-Leste Country EITI Report for 2009." [Available at: http://www.revenuewatch.org/sites/default/files/Timor%20Leste%20EITI%20Report%20 2009.pdf].
- Robinson, J., R.Torvik, and T.Verdier. 2006. "Political Foundations of the Resource Curse." Journal of Development Economics 79(2):446-68.
- Roche, C. 2006. "Environmental Impacts: Land." In Julian Dierkes and Noushin Khushrushahi (eds.), Mining in Mongolia: Some Recommendations for Long-term Investment Agreements in the Mongolian Mining Sector. [Available at: http://www.iar.ubc.ca/programs/InnerAsia/appp\_mining\_in\_mongolia2006.pdf].
- Rosser, A. 2007. "Escaping the Resource Curse: The Case of Indonesia." *Journal of Contemporary Asia* 37(1):38-58.
- Sachs, J., and A Warner. 1995. "Natural Resource Abundance and Economic Growth." National Bureau of Economic Research Working Paper 5938. Cambridge, Mass.
- Samson, M. 2008. "National Strategy for the Protection, Care and Support of Children, Vulnerable to Violence, abuse, Exploitation and Neglect in the Context of the HIV Epidemic in Papua New Guinea—Final Draft." UNICEF and the Papua New Guinea Department of Community Development. [Available at: http://www.unicef.org/eapro/four\_year\_PNG\_strategy.pdf
- Save the Children. 2003. "Lifting the resource curse: Extractive industry, children and governance." London: Save the Children. [Available at: http://www.savethechildren.org.uk/en/docs/lifting\_the\_resource\_curse.pdf].
- Segal, P. 2011. "Resource rents, redistribution and halving global poverty: The resource dividend." World Development 39(4):475–489.
- Segal, P., Laura El-Katiri and Bassam Fattouh. Forthcoming. "Anatomy of an oil-based welfare state: Rent distribution in Kuwait. Forthcoming in David Held and Kristian Ulrichsen (eds.), The Transformation of the Gulf States: Politics, Economics and the Global Order, Routledge, 2011. [Available at: http://www2.lse.ac.uk/government/research/resgroups/kuwait/documents/Fattouh.pdf].
- Susapu, B. and G. Crispin. 2001, October. "Report on Small-scale Mining in Papua New Guinea." International Institute for Environment and Development (IIED) and the World Business Council for Sustainable Development (WBCSD). [Available at: http://pubs.iied.org/pdfs/G00733.pdf].

- Thomason, J and M. Hancock. 2011, January. "PNG Mineral Boom: Harnessing the Extractive Sector to deliver Better Health Outcomes." Development Policy Center, University of Queensland. [Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract\_id=1919304].
- Timor-Leste EITI Working Group. 2007. "Timor-Leste: Extractive Industry Transparency Initiate (EITI) Workplan, 2007-2009." [Available at: http://www.conocophillips.com/EN/susdev/policies/extractive\_industries/documents/wor kplan\_english.pdf].
- Tohmatsu, Deloitte T. 2011. "EITI Quality Analysis Timor-Leste." Revenue Watch International.
- UNICEF (United Nations Children's Fund). 2011. "The State of the World's Children 2011." [Available at: http://www.unicef.org/publications/files/SOWC\_2011\_Main\_Report\_EN\_02242011.pdf].
- UNDP (United Nations Development Programme). 2011. "UNDP's Role in Extractive Industries."
- USEIA (United States Energy Information Agency). 2010. "International Energy Outlook 2010." [Available at: http://www.eia.gov/oiaf/ieo/pdf/0484(2010).pdf].
- USEIA (United States Energy Information Agency). 2011.International Energy Statistics. [Available at: http://www.eia.gov/cfapps/ipdbproject/IEDIndex3.cfm?tid=5&pid=53&aid=1].
- USGS (United States Geological Survey). 2009. "Review of Mineral Trends in Asia." USGS, US Department of the Interior. [Available at: http://minerals.usgs.gov/minerals/pubs/country/2009/myb3-sum-2009-asia-pacific.pdf].
- Van der Ploeg, F and A.Venables. 2011. "Harnessing Windfall Revenues: Optimal Policies for Resource-Rich Developing Economies." *Economic Journal* 121(551):1-30.
- Wall, E. And R.Peron. 2011. "Sharing Mining Benefits in Developing Countries: The Experience with Foundations, Trusts and Funds." Extractive Industries Development Series 21. Washington, D.C.:World Bank.
- Ward, B. 2010. Gender Sensitive Approaches for the Extractive Industry in Peru. Washington, D.C.:World Bank. [Available at: http://elibrary.worldbank.org/content/book/9780821382080].
- Wilburn, D. 2004. "International mineral exploration activities: From 1995-2004." USGS Special Report. [Available at: http://pubs.usgs.gov/ds/2005/139/].

- World Bank, UNCTAD and ICCM. 2006. "Synthesis of Four Country Case Studies: The Challenge of Mineral Wealth—Using Resource Endowment to Foster Sustainable Development." Washington, D.C.: World Bank. [Available at: www.icmm.com/document/278].
- World Bank. 2006, May. "Mongolia: A Review of Environmental and Social Impacts in the Mining Sector." [Available at: http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFICEX T/MONGOLIAEXTN/0,,contentMDK:20940351~pagePK:141137~piPK:141127~theSit ePK:327708,00.html].
- World Bank and Asian Development Bank. 2007. "Economic and Social Development Brief (Timor-Leste)." [Available at: http://www.adb.org/Documents/Books/ESDB-Timor-Leste/ESDB-Timor-Leste.pdf].
- World Bank. 2009. "The Potential Social Impacts of Mining Development in Southern Mongolia." [Available at: http://siteresources.worldbank.org/MONGOLIAEXTN/Resources/Southern\_Mongolia\_S ocial\_Impacts.pdf].
- World Bank. 2010. "Papua New Guinea Country Brief." [Available at: http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFICEX T/PAPUANEWGUINEAEXTN/0,,contentMDK:20174825~pagePK:1497618~piPK:217 854~theSitePK:333767,00.html].
- World Bank. 2011. "Mining's Gender Bias." [Available at: http://go.worldbank.org/8KI2XV6VD0 http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFICEX T/EXTEAPREGTOPENERGY/0,contentMDK:20591161~menuPK:574034~pagePK:34 004173~piPK:34003707~theSitePK:574015,00.html].
- Yusof, Z.A. 2011. "The Developmental State: Malaysia." In P.Collier and A.Venables, Eds., *Plundered Nations? Successes and Failures in Natural Resource Extraction*. Basingstoke: Palgrave MacMillan.
- Zorigt, D. 2011. "Current Situation of Minerals Sector of Mongolia." Power Point Presentation for the UNDP Conference on Avoiding the Resource Curse: Managing Extractive Industries for Human Development, Ulaanbaatar, Mongolia, 22-23 October, 2011.

### Annex 1: Asia's Role as Supplier of Natural Resources

- Asia's bauxite production accounted for about 61% of the world total in 2009. Australia, the world's leading producer of bauxite, produced about 33% of the world total and about 54% of the total for Asia.
- Aluminium production in Asia accounted for 45% of the world total in 2009. China alone accounted for about 36% of the world total and about 79% of Asia's aluminium output.
- Asia accounted for about 19% of the world total mined copper production in 2009. 6% of the world total and 34% of the regional total was accounted for by China. Australia and Indonesia accounted for 30% and 21% of the regional total.
- Asian copper output accounted for about 40% of the world total in 2009. China, the world's largest primary refined copper producer, accounted for 18% of the world total and about 45% of the regional total. In addition, Japan accounted for 20% of the regional total.
- In 2009, 66% of world iron production (in terms of weight) came from Asia. China was the world's major producer of this mineral, with Australia and India following next in terms of total output.
- Asian crude steel output accounted for about 65% of the world total in 2009. China accounted for almost half (about 46%) of the world total and about 71% of the regional total.
- Asia accounted for 43 % of world nickel output (in terms of metal content) in 2009. Indonesia, which was the region's leading producer of mined nickel, accounted for about 13% of the world total and about 30% of the regional total; Australia was the second ranked producer in the region.
- Asian output of mined zinc (in terms of metal content) was about 48% of the world total in 2009. China accounted for about 30% of the world total and about 63% of the regional total. Australia was the second largest producer in the region.
- Cement production in Asia accounted for about 71% of the world total in 2009. China was responsible for 54% of the world total and about 76% of the regional total.
- In 2009, Asia accounted for 95% of anthracite and 65% of bituminous coal output. Once again, China accounted for the lion's share of world output—about 74% of the world total anthracite output—and about 78% of the Asian region's total anthracite output. Similarly, China accounted for 45% of the world total and about 69% of the regional total of bituminous coal.

Source: US Geological Survey (2009b: 1-2).

Country	Youth Population (as a percent of Total population)	Natural Resources	Income Status
Maldives	17.57		Lower Middle Income
Zimbabwe	17.26		Low Income
Swaziland	17.15		Lower Middle Income
Iran (Islamic Republic of)	16.39	Oil	Lower Middle Income
Grenada	16.35		Upper Middle Income
Cambodia	16.08	Oil	Low Income
Tajikistan	16.03		Low Income
Lesotho	15.98		Lower Middle Income
Mongolia	15.88	Minerals	Lower Middle Income
Burundi	15.86		Low Income
Uzbekistan	15.59		Low Income
Cape Verde	15.43		Lower Middle Income
Botswana	15.43	Minerals	Upper Middle Income
Rwanda	15.34		Low Income
Micronesia (Fed. States of)	15.32		Lower Middle Income
Bhutan	15.25		Lower Middle Income
Turkmenistan	15.17	Oil	Lower Middle Income
Lao PDR	14.85		Low income
Yemen	14.75	Oil	Low Income
Namibia	14.74		Upper Middle Income

# Annex 2. Top 20 Countries: Youth in Total National Population in 2010

Note: Countries with major extractive industries in bold. Source: Mendoza, Murthy and Komarecki (2010).

Annex 3. Top 20 Countr	ries: Youth in Total	World Population in 2010
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Countries	Percent of World youth	Of the top 20, countries who have imminent or forthcoming youth bulge peak (Peak years in parenthesis)	Natural Resources	Income Status
China	19.59		Oil and minerals	Lower Middle Income
India	18.80		Oil and minerals	Lower Middle Income
United States of America	3.69		Oil and minerals	High Income
Indonesia	3.35		Oil and minerals	Lower Middle Income
Pakistan	3.11	√ (2009-2010)		Lower Middle income
Brazil	2.79		Oil and minerals	Upper middle Income
Bangladesh	2.69			Low Income
Nigeria	2.49	<b>√</b> (2028)	Oil	Lower Middle Income
<b>Russian Federation</b>	1.85		Oil and minerals	Upper Middle Income
Mexico	1.58		Oil	Upper Middle Income
Philippines	1.49		Minerals	Low Middle income
Iran (Islamic Republic of)	1.44	<b>√</b> (2008-2009)	Oil	Lower Middle Income
Egypt	1.43	<b>√</b> (2008)	Oil	Lower middle income
Viet Nam	1.39		Oil	Low Income
Ethiopia	1.35	√ (2014)		Low Income
Turkey	1.07			Upper Middle Income
Dem. Rep. of the Congo	1.06	<b>√</b> (2020-2023)	Oil	Low Income
Japan	1.06			High income
Thailand	0.87			Lower middle income
South Africa	0.83	√ (2008)		Upper middle income
Germany	0.78			High Income

Note: Countries with major extractive industries in bold. Source: Mendoza, Murthy and Komarecki (2010).

### Annex 4. A Proposal for an Inclusive Growth Trust Fund to Manage Natural Resource Wealth in the Philippines

According to Philippine government statistics, total annual mining output stands at well over PhP100 billion and this will increase further with expanded mining operations. With already about US\$4 billion investments in the last 6 years, the Philippine mining industry is expected to be boosted by up to US\$18 billion in additional investments by 2016. The country is sitting on vast amounts of mineral resources—Philippine nickel output alone is expected to reach 7th in the world by 2012 in terms of international production.

Despite our mineral and other wealth, roughly one-fourth of our population lives in poverty. Instead of being a boon to development, mining operations in the Philippines have often been associated with governance problems and environmental harm. Tax receipts from mining operations are also not very clearly linked to development related investments—instead, the bulk of it disappears into the general pooled budget, and we have little to show for the amount of wealth already mobilized through mining.

#### How are mining resources presently mobilized and used?

Government revenues from mining come mainly from the taxes, fees and royalties. The national government takes in about 60 percent, while local governments with mining operations take up the remainder. The Mining Act of 1995 and its implementing regulations led to the creation of trust funds for the rehabilitation of mining areas as well as financing social development and management programs for the local population.

These mainly focus on promoting local development and livelihoods, as well as protecting areas affected by the mining project. While useful, these appropriations appear more as compensation, rather than as additional funds to boost nation-wide development prospects. Further, taxes, fees and royalties from mining are not directly tied to human capital investments. Ultimately, mineral deposits are exhaustible, so development strategies should consider the inevitable need to shift the economy to a non-mineral extraction based model. Wealth from the mining industry could also be used and distributed to promote sustainable development and more inclusive growth.

Other countries offer potential lessons on professionally managed financing mechanisms designed to promote more inclusive growth through mining. For instance, all oil-related revenues

in Norway are first paid into the Norwegian Government Pension Fund (formerly the Norwegian Petroleum Fund), which has the principal objective to ensure that future generations also benefit from the exploitation of the country's non-renewable resources.

In Chile, revenue from its copper industry funds the Economic and Social Stabilization Fund which is partly used as a "rainy day fund" to help stabilize social spending when the economy is in bad shape. During the recent global economic slowdown, this fund was used to put together an adequate and timely stimulus package that would spur lending to households and small and medium-sized businesses, as well as boost public works projects and provide financial and other support for poor and vulnerable Chileans.

Governance and professional management of these funds is surely important, and our analysis of the evidence suggests that, unsurprisingly, natural resource wealth is linked to stronger economic and human development only under better governed environments.

#### An "inclusive growth trust fund"

Part of the tax revenues from the mining industry could help boost human capital investments in the Philippines—to help illustrate, a 5 percent mining levy on three of the country's top mineral resources alone (e.g. gold, nickel and copper) can generate up to PhP4 billion per year which can be used to finance a trust fund for human capital investments. If the projected quadrupling of investments will also (at least) quadruple output, then total revenues from such a mining levy could easily reach about PhP16 to 20 billion per year. This is probably very conservative— output is likely to be larger (if indeed the investments materialize) and this does not yet consider the next commodity boom cycle (which seems to be well underway).

Strong accountability mechanisms could be built into the fund itself. Resources could be allocated transparently and specifically towards programs on education and health investments for children with clear targets and timelines. For instance, it could accelerate government efforts to bridge the classrooms deficit faced by almost 19 million of our school children who have no or dilapidated classrooms, by quintupling the annual budget for classroom building. It could also help sustain the country's flagship social protection program, Pantawid Pamilyang Pilipino Program (4Ps). In addition, it could boost our country's human capital investments and significantly advance our research and development capabilities to compete in global markets and the knowledge economy.

Tying part of the wealth from mining to human capital investments and related competitiveness measures could make sense on several levels. First, it could help increase the accountability in the use of these resources. The creation of an inclusive growth trust fund could be underpinned by institutionalized participatory mechanisms for academia, civil society, the media and other stakeholders to monitor allocations as well as participate in deliberations of investment decisions. This is the case in many countries that have managed to use mining resources to boost development prospects.

Even mining companies—at least the truly legitimate and professionally managed ones could find this arrangement much more appealing than the status quo, since the lack of transparency in the industry is essentially eroding public support for extractive industries altogether, harming the reputation of all mining firms, well-run or not. Second, such an innovative financing mechanism for development could help ensure that national level (and not just region specific) development objectives are promoted by the mining sector. Minerals in the country are part of the national patrimony, and not just the wealth of any specific region or province in which these are extracted from.

Third, given the instability introduced by extractive industries dependence and the commodity boom and bust cycle, it would be useful to consider ways through which natural resource wealth could also help to protect the population from the pernicious effects of this economic instability. This is the case, for example, when part of the resources is used to boost social protection programs, such as what other countries (such as Chile) did during the recent food, fuel, and financial (3Fs) crises.

Finally, human capital investments could help boost prospects for long run growth, while at the same time promoting a much more inclusive growth process. Through this inclusive growth trust fund, we could arm the next generation with the requisite education and good health, among other human capital investments, that are needed to compete in both the domestic and global economies.

Source: Mendoza, Ronald U. 2011. "A Middle Ground on Mining" *BusinessWorld*, 7 June 2011.

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