



WIDER Working Paper 2018/99

## **Extractives for development**

Ten main messages

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August 2018

**Abstract:** Countries face both challenges and opportunities in using their extractive industries to achieve more inclusive development—particularly in the developing world. Yet while a large national income can result from resource wealth, it can also be associated with acute social inequality and deep poverty. Many countries struggle to diversify their economies, and create redistributive fiscal systems. The very worst cases see violent conflict and civil war. The expression ‘resource curse’ has in turn become common coin. This paper presents 10 main messages from a UNU-WIDER Project, that should underpin efforts to improve development and environmental outcomes in the extractive industries.

**Keywords:** extractive industries, resource wealth, resource curse, inequality, poverty, fiscal systems  
**JEL Classification:** O20, O44, Q02, Q32, Q33, Q40

**Acknowledgements:** We thank Ans Vehmaanperä for the editing and preparation of this working paper, and Lorraine Telfer-Taivainen for editing an earlier version.

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This study has been prepared within the UNU-WIDER project on ‘[Extractives for development \(E4D\)](#)’, which is part of a larger research project on ‘[Macro-economic management \(M-EM\)](#)’.

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ISSN 1798-7237 ISBN 978-92-9256-541-1 <https://doi.org/10.35188/UNU-WIDER/2018/541-1>

Typescript prepared by Ans Vehmaanperä.

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## 1 Introduction

Countries face many challenges in using their extractive industries to achieve inclusive development. There are also many opportunities. In this paper our focus is on the developing world, both low-income countries (LICs) and middle-income countries (MICs), drawing upon the experiences of high-income countries (HICs) when relevant. Extractive industries have shaped the economies, societies and politics of nations—for good and bad. Today’s richest nations owe at least part of their high living standards to the extractive industries. Yet while a large national income can result from resource wealth, it can also be associated with acute social inequality and deep poverty—the very opposites of inclusive development. Many LICs and MICs struggle to diversify their economies, and create redistributive fiscal systems, in ways that reduce poverty, inequality, and social division. The very worst cases see violent conflict and civil war.

The phrase ‘resource curse’ became common coin by the turn of the millennium. Crises and resource-wars were important catalysts in a new determination to improve the sector’s governance. Global civil society, notably Global Witness and Oxfam America, together with the Natural Resources Governance Institute (NRGI) and industry bodies such as the International Council on Mining and Metals (ICMM) have led efforts to achieve improved outcomes for the extractives sector. One of the most notable manifestations of this was the Extractive Industries Transparency Initiative (EITI) launched in 2002. These all recognize, in different ways, that natural resources can provide a means, when properly used, for poorer nations to decisively break with poverty.

National ambitions for the extractives sector were given a major boost in the years after the millennium by an upswing in the prices of metals and fuels, following low prices in the 1980s and 1990s. China’s economic boom resulted in a seemingly insatiable demand for commodities of all kinds and this, together with limited supplies after years of low investment, created a ‘commodities super-cycle’. Growth elsewhere in the global economy added to demand. Euphoria returned during the super-cycle years from 2002 with buoyant export earnings and public revenues, as well as higher economic growth (though often of a narrow and undiversified kind). Very large investments were made in mining as well as in oil and gas after many years of moderating capacity; much of this was in the LICs and MICs.<sup>1</sup> Producers rode the super-cycle, including a sharp dip during the 2008-9 financial crisis, for more than a decade until it finally stalled in 2011-12.

However, the price slump did remind companies and governments of the commercial and economic risks associated with the extractives sector. Companies cut production and scaled-back many of the investment plans made during the super-cycle years. Host countries initiated macro-economic adjustments in response to lower revenues, their options limited in many cases by a failure to build fiscal buffers and diversify their economies during the good times. Painful adjustments are still ongoing in countries that over-accumulated debt.

Prices are now above their lowest levels, though for oil and gas, as well as many metals, they are still far from their super-cycle peak. Nevertheless, prices in real terms remain above their long-term trend levels in the case of most metals as well as also oil (see Stevens, 2016). Some metals required in the manufacture of batteries for electric vehicles and in renewable energy technologies,

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<sup>1</sup> Oil and gas exploration and production spending globally rose over four-fold between 2000 and 2012 and the global exploration spend of mining companies was almost US\$30 billion in 2012 as compared to less than US\$3 billion in 2000 (World Bank, 2015).

notably cobalt and lithium, experienced spectacular price increases in 2017 because of significant supply/demand imbalances (Addison, 2018).

The size and direction of future price changes are inherently uncertain. A myriad of forces will determine the future of each extractives sector, favouring some fuels, minerals, and metals at the expense of others. The forces driving the future include: the pace and pattern of global economic growth (with India perhaps nudging China's position as the leading driver of Asian commodities demand); the speed of the shift from fossil fuels to renewables in the overall energy mix (in turn a product of technical change as well as national and international climate action); and changes in the industry itself, including the pace of technical change that makes it easier to develop new deposits in more difficult locations, as well as the adoption of 'green mining' in order to minimize the sector's own environmental footprint. Developing countries need a strong understanding of these trends as they play out. LICs and MICs have become significantly more important as producers of extractives in recent years (see Roe and Dodd, 2017, and Ericsson and Löf, 2017). Since this tendency will almost certainly continue, their prospects for growth and poverty reduction significantly depend upon their extractives sectors and how these are managed. Although 'keep it in the ground' is a theoretical policy option, it is not an option that is likely to be widely adopted in practice (see Lahn and Stevens, 2017).

## 2 The UNU-WIDER Project

Addison and Roe (2018a) aims to provide a comprehensive contribution to a lively and ongoing debate, in which many stakeholders now participate: governments and their international partners (bilateral and multilateral development agencies); the industry itself (the companies together with industrial associations such as ICMM and IPIECA);<sup>2</sup> community-based organizations (and their NGO and INGO partners); the national and international media; and the research community in universities and think tanks. This debate centres on achieving *practical action* to deliver inclusive development using resource wealth, protect often fragile environments from damage, enhance the rights of affected communities (and the benefits to them), and support climate change action. Central to these tasks is the creation of a set of effective and accountable institutions to manage the extractives sector and maximize its potential for development impact. In addition to capturing the flavour of current debate on extractives and development, Addison and Roe (2018a) offers ideas and some recommendations in most of the main policy areas.

Since no single person has expertise on every facet of extractives and development, the UNU-WIDER project on '[Extractives for development \(E4D\)](#)' brings together a range of international experts from many disciplines and organizations; it therefore represents – we hope – a large amount of collective insight and experience. The book by Addison and Roe (2018a) is accompanied by a website which makes available additional materials.<sup>3</sup> The UNU-WIDER project does not seek to define a single formula for 'success'. Instead it offers a comprehensive but integrated account of the multiple ingredients that are needed to turn the undoubted potential of extractives wealth into the reality of sustained improvements in living standards and social wellbeing. The next sections present **ten** of the most important messages from Addison and Roe

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<sup>2</sup> IPIECA is the global oil and gas industry association for environmental and social issues.

<sup>3</sup> [www.wider.unu.edu/project/extractives-development-e4d](http://www.wider.unu.edu/project/extractives-development-e4d). The website makes available further papers, including more country case studies and papers that discuss topics not covered in Addison and Roe (2018). The latter is Open Access. The web site also links to video interviews with the authors of the chapters in this volume, as well as other experts, which are located on UNU-WIDER's YouTube site.

(2018a). We then conclude with a restatement of what we believe is important to ongoing debate and action on this most vital of development issues.

### 3 Message 1: Extractive Industries Are Important in Developing Economies and Will Remain Important

Extractive industries have become more important to export revenues and government revenues in many LICs and MICs, over the last twenty years. Of the seventy-two LICs and MICs that we identify as *most* dependent at least in terms of extractives *exports*, sixty-three have increased their dependence on extractives resources over the past fifteen to twenty years (see Roe and Dodd, 2017). While development economics emphasizes the desirability of structural transformation to diversify economies away from dependence on primary products including extractives, dependence is increasing in many developing countries.

Why is this? The main reason is that many of the newer extractive investments have been so large relative to the size of national economies. A second reason is of course the highly favourable prices for extractive commodities over an extended period. However, a failure to prioritize diversification is often an important further reason. Resource wealth is notorious for stymieing policy action, when non-renewable resources are viewed as perpetual generators of wealth, and not as finite (time-limited) opportunities. Sometimes diversification is attempted, but when the new investments to achieve this are badly selected, the economy's vigour is reduced rather than enhanced—leading to more, not less, dependence on extractive exports and revenues.<sup>4</sup> Although it is the case that the shares of extractives in the national economy, export earnings and public revenues have risen partly because prices have risen, levels of extractives dependence in LICs and MICs remain at historically high levels even after the adjustments provoked by the price falls of 2011 and 2012 (Roe and Dodd, 2017).

Box 1 provides a summary of some of the main factors that lie behind the recent observed trends.

#### Box 1: Global market trends: selected influences

China has been, and continues to be, easily the biggest driver in this story. Chinese demand for commodities grew through the 1990s, but really took off after 2000, with its WTO accession in December 2001 supercharging its exports, and consequently its imports of essential inputs (Erten and Ocampo 2013). China is a net importer of most metals as well as oil and gas, with an especially strong appetite for bauxite, copper, iron ore, nickel, and uranium (Pigato and Tang 2015). In the period 2001-6, when world prices of metals almost tripled, China accounted for more than 50 per cent of the rise in demand (Francis 2007: 20). China's sustained demand was also one reason why prices rebounded following their dip during the 2008-9 financial crisis.

Commodity prices move in cycles along with the global business cycle. The fall in the oil price from 2011, and especially from 2014-16, was dramatic and many metals prices—especially iron ore—saw similar sharp falls. Market analysts have been calling the end of the 'commodity super-cycle' for the past 2-3 years, though forecasting is notoriously difficult—some would say impossible—in this area. Although these falls have disturbed the markets, it is also significant that in real terms, commodity prices are mostly higher than was the case twenty years ago, and some of the forces driving up prices over the longer-term are still in play.<sup>5</sup> These include China's continued economic growth. Although this has slowed to around 6.5 per cent

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<sup>4</sup> On the role of industrial policy see Dietsche (2017a).

<sup>5</sup> ICMM (2016) provides some analysis of these forces as they apply to metals.

annually, China's economy is now some four times its size at the turn of the Millennium when growth was much higher (at around 9 per cent). More generally, the past twenty years have seen the physical demand for metals growing significantly faster than global GDP and this high elasticity seems well established (ICMM 2016) The demand for energy and metals continues to be robust as MICs that currently consume fewer extractives products (per capita) than richer countries accelerate their economic growth.

Whereas the market outlook for commodities remains positive overall, there will be plenty of change in *relative* prices within the commodities category, as well as winners and losers amongst nations (and companies). The fossil fuels (oil, gas, and coal) illustrate both points; they will see sustained demand assuming continued global economic growth, but their market share in global energy production will decline as climate change actions accelerate (see Message 10) and OPEC remains under pressure from US shale production (with the US likely to become the world's largest exporter of liquified natural gas (LNG) in coming years). The prospects for metals are generally good, as renewables gain market share in energy production (see Message 10).

#### **4 Message 2: Developing Economies Have Great Potential to Develop their Extractive Resources Further**

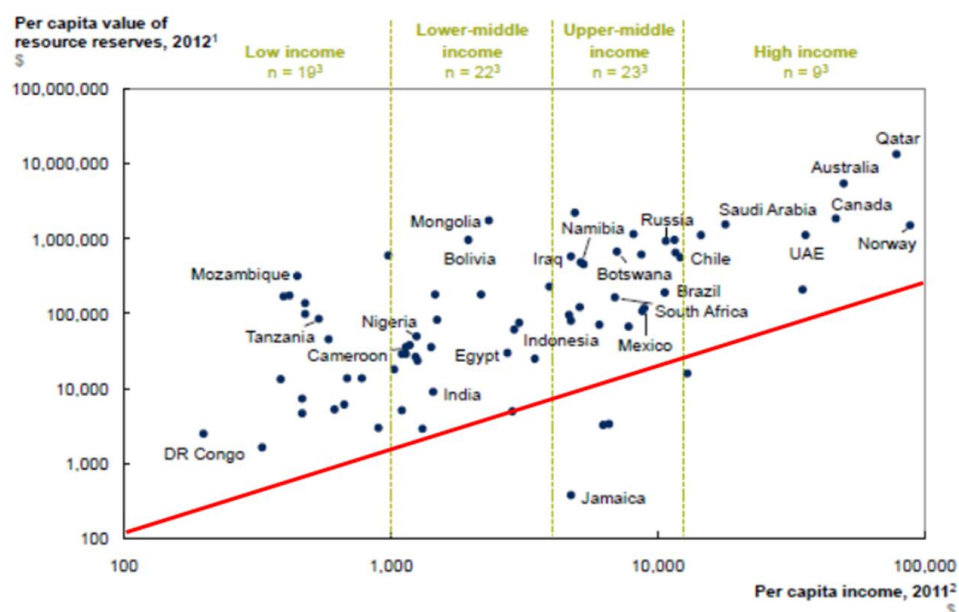
Extractive industries have increased, rather than decreased, in importance for many LICs and MICs (*Message 1*). Additionally, it is anticipated that many, though not all, extractives sectors will see considerable further investment in the future; this is certainly so for most sectors and especially for metals (see analysis by the McKinsey Global Institute (MGI 2013)) notwithstanding the adjustments associated with climate change policies (see also Addison, 2018). The second main message is that the LICs and MICs are in many cases very well positioned to take advantage of this expected growth in commodities demand—*should they choose to do so*.

Many of these countries have huge unexploited reserves of resources. Data from MGI (2013) reproduced as Figure 1 indicates the scale of that potential. In many of the LICs and MICs shown in the figure, reserves are a huge multiple of prevailing per capita income levels (remembering that the vertical scale is logarithmic). In some county cases the calculus of future potential is dramatic. Guinea for example (per capita income of US\$508 in 2016) is thought to have one quarter of the world's total reserves of bauxite—most high grade and unexploited. But it produces only at the level of production in China and India which have only one tenth of Guinea's reserves. Furthermore, these data significantly underestimate the developing world's full potential because in relative terms so little geological exploration has taken place in LICs (as well as many MICs), and this is only now changing.<sup>6</sup>

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<sup>6</sup> For example, non-ferrous metal exploration in Africa increased from less than US\$17 per sq km in 2000 to US\$189 per sq km in 2012. Similar statistics can be cited in relation to oil and gas (MGI 2013: 32).

Figure 1: Known reserves (2012) and per capita incomes (2011)



Source: MGI (2013:30 Exhibit 3); reproduced here with permission.

The reason why we enter the caveat above ‘should they choose to do so’, is clear. In the past many LICs and MICs endowed with large extractives resources have not seen significant growth or broader development benefits from exploiting these. Data from the MGI (2013) study suggests that in the period 1995 through 2011, there were slightly more resource dependent countries with below average per capita incomes that fell further behind (in terms of per capita income) than the number that caught up or surpassed the average growth of per capita income (MGI 2013: 34).

This relationship between per capita income, resource wealth and subsequent economic growth can also be interpreted as highlighting the dangers that resource wealth poses to a country’s chances of raising its average living standard. A very risk-averse development strategy might conclude: ‘leave the resources in the ground’. But that carries a high opportunity cost as the revenues (which can far exceed any alternative source, including foreign aid) can fund major pro-poor spending and development infrastructure (including that needed to diversify the economy itself). Moreover, while the risks are indeed high, development disaster is not a foregone conclusion: there are countries like Botswana that have achieved upper middle-income status (Leith 2005). More generally, the MGI study also shows that *if* the record of the more successful resource-driven countries could be replicated by LICs and lower middle-income countries then there is the potential to lift more than 500 million more people out of poverty by 2030 (MGI, 2013: 23). This is a tantalizing prize and it is easy to see why developing countries are unlikely to be persuaded by arguments that they should forego the use of their resource endowments.

A key task of development advisers and analysts is to explore all the possible ways to deliver the best possible outcomes for sustainable and inclusive development. This includes efforts to improve governance of the extractives sector, as poor governance—implying high risks for potential investors, both domestic and foreign—is a major reason why many LICs have huge unexploited reserves (see *message 6* below). That said, the market for fossil fuels faces strong headwinds from climate change action and the rapidly declining cost of renewable energy (Addison, 2018). Reserves of fossil fuels will eventually constitute ‘stranded assets’ (see *message 10* below).

## 5 Message 3: Strategies Should Be Guided by Realism: Neither Euphoria Nor Despair Are Helpful

Many have dreamt, and many still do, of striking it rich by discovering a valuable mineral or better still oil. Thriving mine towns had a powerful hold on the imagination of nineteenth century America. The soaring architecture of the Gulf states, built on oil wealth, captivates the modern imagination. The scale of the potential rewards inspires explorers, miners, and investors, while politicians dream of fast-tracks to national prosperity. But alongside such euphoria sit dismal images of the ghost towns left behind once mines closed, worthless infrastructure and industries erected during the good times, and environments and communities devastated by mine tailings and oil spills. For many, the phrase ‘boom and bust’ sums up the extractives sector.

The watchword of the UNU-WIDER project is ‘realism’. In crafting strategies to deliver prosperity from resource wealth, countries need to thoroughly understand the risks—drawing on the many available lessons—while putting in place policies and investments that realize the development rewards. Extractive industries when reasonably well managed for the good of the nation, are one of the few means available to poor countries to escape poverty: above all they avoid many of the economic preconditions required to attract large scale investment in other productive areas such as manufacturing. However, their good management requires realism about the likely level and duration of the associated government revenues, close attention to price volatility (and the consequent revenue risks), and the creation of fiscal buffers to accumulate savings in good times in order to protect essential development spending in bad times (see van der Ploeg and Venables, 2017). Good management also entails avoiding ill-judged investments that carry high risks of failure (see Östensson and Löf, 2017) while investing in human capital and sectors, existing and new, with a good potential.

Discussion and practice on extractives and development in the past few decades have been marked by both optimism and pessimism, with one or the other being in the ascendant at any particular time, but neither being dominant across time. The thesis of the resource curse (and ‘Dutch Disease’) prevailed for many years from the mid-1980s onwards (see Lahn and Stevens, 2017). However, something of a turning point on the need for change was reached around the start of the new Millennium as pressures for improvement converged from different directions. One pressure came from the pain of macro-economic adjustment, in response to low commodity prices in much of the 1980s and 1990s. Wars in which combatants fought for control of valuable resources had left catastrophic human and economic damage, not least in West Africa, in the last years of the twentieth century. The media, community-based organizations and NGOs had exposed abuses of communities around mining sites (especially of indigenous communities), environmental damage (sometimes catastrophic) and extensive corruption and the appropriation of revenues for private gain. High-profile reports and campaigns by Global Witness, Human Rights Watch, and other NGOs put pressure on the industry to start paying greater attention to its social and environmental impacts.

Another catalyst for change arose in the World Bank which, given its prominence, is often a lightning rod when development crises erupt. Amid mounting and well-organized criticism by the NGOs of the mining industry, World Bank President James Wolfensohn commissioned a review of World Bank operations in the sector namely the Extractive Industries Review (EIR) (World Bank 2003). Led by Emil Salim, a former Indonesian environmental minister, the EIR process listened hard to all stakeholders. By asking whether extractives projects were compatible with the Bank’s goals of poverty reduction and sustainable development, the EIR’s initial recommendations placed a serious question mark over the Bank’s future work in the sector. The review concluded that the Bank should only continue to support investments in the extractives sector if its



interventions could be shown to contribute to poverty alleviation through sustainable development. And this was only possible if three enabling conditions were met: (i) pro-poor public and corporate governance; (ii) much more effective social and environmental policies; and (iii) greater respect for human rights (World Bank, 2003). The review concluded that the Bank should stay out of further investments in the industry until the sector's 'governance' was significantly improved.<sup>7</sup>

The EIR process together with the NGO campaigns also strengthened the forces for change within the mining industry. These were in any case gathering momentum by the new Millennium. The Global Mining Initiative (GMI) was created by a group of mining company CEOs and building on this nine of the world's largest mining companies commissioned a major new initiative, the Mining, Minerals and Sustainable Development Project (MMSD), to examine how minerals and mining could best contribute to global sustainable development (MMSD, 2002). As it proceeded more companies joined the MMSD process as did a number of donor agencies. The mining companies driving the MMSD process eventually constituted themselves as the International Council on Mining and Metals (ICMM), and the MMSD germinated ICMM's ten existing sustainability principles. In contrast to the mining industry, the oil and gas industry did not undertake a comprehensive sustainable development review, let alone one led by company CEOs, and responses to campaigns were not coordinated at the industry level; any initiatives tended to come from individual companies, notably Shell and BP (during John Brown tenure as BP's CEO over 1995-2007) (Tomlinson, 2017).<sup>8</sup>

Several new international initiatives also emerged which aimed to encourage more transparency in natural resources management. George Soros established the 'Revenue Watch' programme under his Open Society Initiative to investigate the flow of funds from oil companies to governments in the Caspian region. International initiatives culminated in the Extractive Industries Transparency Initiative (EITI). At an international conference convened in London by DFID in June 2003, a Statement of 12 Principles to increase transparency of payments and revenues in the extractive sector was agreed; EITI was then founded to give effect to these (Cust, 2017).

In summary, while some observers remain deeply pessimistic about the developmental benefits of the extractives sector, in the past two decades a great deal of national and international effort has been devoted to trying to avoid this becoming a foregone conclusion (Hodge, 2017), provides a fuller listing of the very many post-2000 initiatives). During the super-cycle period an 'extractives for growth' agenda had become accepted by some donor agencies in an era of much greater optimism. But as explained in detail in Lahn and Stevens (2017), excessive optimism is scarcely justified. Instead what is needed is a well-grounded realism that involves above all trying to learn from, and then avoid, the mistakes of the past, being cautious and avoiding over-optimism, while recognizing that extractive industries if well managed can certainly support sustainable development.

## **6 Message 4: Diversifying Economies Is Critical, but Hard to Achieve**

The academic literature has become somewhat fixated on the phenomenon of 'Dutch Disease' and the 'resource curse' more broadly. Lahn and Stevens (2017) argue persuasively that the

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<sup>7</sup> Given that the term 'governance' was at that stage only loosely defined, this recommendation encouraged significant work to try to pin down exactly what it meant: an issue summarized in Dietsche (2017b).

<sup>8</sup> A global oil and gas industry association for environmental and social issues, IPIECA, was established in 1974.

resource curse propositions offer no real guide to practical policy. They suggest that these propositions should be stood on their head to ask the following question: why, in many countries, has the (often large) extractives sector failed to become the leading sector for the rest of the economy?

Such an approach suggests that much greater focus and attention than is common should be given to the role of the sector over time in a country's overall and long-term development strategy. Bearing in mind that extractives are always depletable resources (even though the time horizon for depletion can be very long in some cases) other productive activities will in time need to replace them if any initial growth and development is to be sustained. This approach leads naturally to a fuller assessment than is normal of the manner in which an extractives activity might function over a long time-period and during that time might catalyse other non-extractive activities: what actions are needed to promote and maximise such effects? Similarly, it draws attention to pitfalls that could undermine the catalyzing influence coming from extractives: are these impediments purely macroeconomic in nature (see van der Ploeg and Venables (2017), Solimano and Guajardo (2017), and Bawumia and Halland, 2017) or might sectoral policies and issues be equally or more significant? What services, jobs, and business opportunities can realistically be generated from the extractives operations including opportunities to provide more and cheaper domestic energy linked to possible oil and gas resources? These and some related questions are addressed using specific country examples are in Östensson (2017) and Östensson and Löf (2017).

The literature review by Lahn and Stevens (2017) and the focus it brings to bear on *economic diversification* provides a natural lead in to a sequence of other papers in the UNU-WIDER project that analyse several distinct aspects of the linkage effects of extractives and the policies needed to achieve these in much greater detail (by respectively Roe and Round (2017); Östensson (2017); Östensson and Löf (2017) and Jakobsen and Witter (2017). Moreover, McPhail (2017) looks at an 'all of government' approach to policies for extractives sectors. Because of its attention to broader development strategies it also brings into the limelight the controversial suggestion that some countries might be well advised to hold back from developing certain extractives reserves or to develop them at an appropriate pace against the inevitable pressures from popular, political, investor (shareholder) interests to ramp up production as quickly as possible.

## **7 Message 5: Better Institutions Are Vital to Success but Technocratic Institution-Building Has its Limitations**

Creating effective institutions is vital to success both in a technocratic sense (personnel, processes etc.) and in the politics around these processes (whether they are open to capture by personal political interests etc.). This is hardly a new message—development debate has been replete with references to institutional development for the last two decades at least—but it remains especially relevant to resource-rich countries where progress has often been especially difficult. Many of the chapters in Addison and Roe (2018a) refer to the role and importance of institutions and address many different aspects of the institutional and governance challenge including: government management of macroeconomic policy, taxation (Otto, 2017a) and public expenditure policies; the use of quasi-government agencies such as state oil companies (Heller, 2017) and sovereign wealth funds (Van der Ploeg and Venables, 2017); gender equality (Macdonald, 2017a) the sectoral management issues around local content (Östensson, 2017) and the stimulation of downstream activity (Östensson and Löf, 2017); environmental regulation (Bell, 2017), regulation of the sector (Addison and Roe, 2018b; Aubynn, 2017) and the management of community relations (Macdonald, 2017b; Slack, 2017). The political economy realities and difficulties must be taken full

account of, and it is desirable to coordinate across these many different aspects of governance: a requirement that is often lacking in practice.

Using a framework originally advanced by Oliver Williamson (2000) and Dietsche (2017b) relates extractives issues to four levels of institutions. Level 1: *social embeddedness* (customs, tradition, norms, religion). These affect the way that people, through their social networks, see their rights with respect to resource revenues, jobs and other benefits.<sup>9</sup> These are often subject to considerable inertia. Level 2: the *institutional environment* (formal rules of the game), that is constitutional rules regarding ownership of primary resources (and how the different levels of government engage with extractives). This includes the state's capacity (at all levels, from central to state/provincial to local) to provide public goods and services that can maximize the benefit of the extractives sector. Level 3: *Governance* or 'play of the game' (how specific rules are set up between companies and governments) including written contracts, safety rules (balancing costs versus safety), and whether countries have mandatory obligations to communities, or only voluntary codes of conduct. Level 4: *resource allocation and employment*: the set of commercial decisions for selecting and implementing projects, how much labour to use versus labour-saving technologies and so forth.

Policies to enhance the contribution of extractive industries to inclusive and sustainable development most commonly focus on levels 2 and 3—through such measures as revising legal frameworks, the drafting of fairer contracts etc. These are typically the levels in which international action seeks improvements, and in which most aid donors concentrate their support to governments. However, it can be difficult to make progress when social networks (level 1) are resistant and well-organized. This is especially so when they exercise control of the state, or have a high degree of influence upon it. The Chad-Cameroon Petroleum Development and Pipeline Project makes this point painfully well. It was a model of its kind when approved (i.e. a good outcome at level 2), but was unable to deal adequately with a governing elite that grabbed most of the resource rents to fund the military and defend itself (level 1). Powerful family networks and their allies may constitute 'deep states' enabling them to control public money, including resource taxes, and to allocate mining rights, as well as oil and gas concessions, in favour of businesses controlled by the network itself and to the detriment of levels 2 and 3. Such networks are especially prevalent in nations with histories of extended violent conflict (Addison, 2003). In a worst-case scenario, such as South Sudan, competing networks will disregard any formal rules designed to peacefully manage competing pressures, and will instead go to war.

The democratic electoral cycle, which provides an essential means for voters to express their preferences over the use of natural resource wealth, also interacts with level 1. Long-standing networks provide an instrument for political incumbents and challengers to mobilize support, and build winning coalitions. In doing so, the temptation is to spend and borrow to win elections, perhaps overriding level 2 institutional limitations that are designed to preserve macro-economic stability.

Ghana's recent experience makes this point. A decade ago, as Ghana looked to its future as an oil economy, policymakers examined carefully the lessons of oil-rich Nigeria. They were determined to avoid Nigeria's mistakes, and created what was thought to be effective institutional checks and balances on over-spending and over-borrowing. Nevertheless, the government over-spent and over-borrowed, in the lead up to the 2012 elections. In terms of Oliver Williamson's four-fold institutional typology, the second level was organized to a high standard, notably through the 2015 Petroleum Revenue Management Act (PMRA) which created a Sovereign Wealth Fund (SWF).

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<sup>9</sup> Economic sociology, notably the work of Karl Polanyi (2001 [1944]), emphasizes how economic systems are embedded in social networks and their relationships.

But its effectiveness was then overwhelmed by level 1 pressures, in part expressed through electoral politics: a point strongly endorsed by Bawumia and Halland (2017).

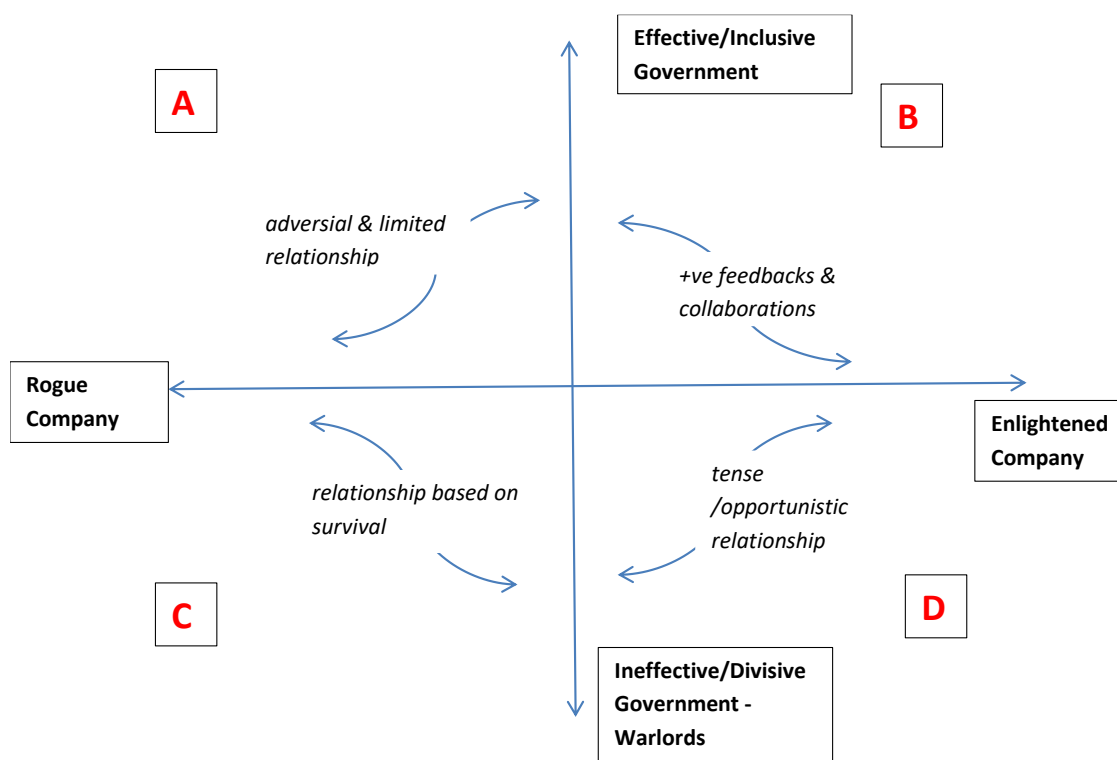
The widespread transition from authoritarianism to multi-party democracy over the last thirty years must be celebrated. But both old and new democracies face the challenge of building and maintaining formal institutional systems, including the checks and balances (as well as transparency) necessary to manage competing demands on the public purse. This frequently has a regional dimension as well, where systems for the distribution of resource rents are often associated with tensions between the centre and local political levels (Nigeria being one example).

In sum, ‘institutions’ are vital and many of the contributions to Addison and Roe (2018a) drill down into their various meanings in the context of many specific aspects of extractive industry management. In this manner, the UNU-WIDER project gives substance to the proposition that it is not enough merely to assert that ‘good governance’ and ‘good institutions’ are important. These complex topics need to be unpicked and assessed in all their multiple aspects. The UNU-WIDER Extractives project seeks to do this based on the underlying view from most of its contributions that positive change based on extractives industries is possible, but also that the institutional ingredients of such success are by no means assured.

## **8 Message 6: Effective and Inclusive Government Working with Enlightened Companies Is the Ideal Combination. Ineffective and Divisive Government Combined with Rogue Companies Is the Worst**

Figure 2 below sets out a simplified taxonomy of the different situations that we find in extractives-dependent economies around the world. It illustrates a spectrum of governance and institutions from *effective and inclusive* through to *ineffective and divisive* (on the vertical axis). By effective, we mean a state capable of formulating and delivering a development strategy, and by inclusive we mean a strategy that aims to achieve development for everyone in society, but especially for the poor (and one that protects and sustains the environment on which inclusive development is ultimately based). Figure 2 also shows a spectrum of company behaviours from *highly enlightened* (working with communities and states to deliver inclusive and sustainable development) to ‘rogue’ (no concern whatsoever for the company’s social, political and environmental impact) on the horizontal axis.

Figure 2. A Simple Taxonomy of Governance and Company Behaviour



Source: authors' illustration.

Zone B is the one in which there is likely to be the greatest prospect of outcomes that are inclusive and sustainable as an enlightened company works collaboratively with a relatively well-organised and inclusive government. Both parties may have technical limitations but the necessary conditions are in place for cooperation to evolve in ways that deliver successful outcomes for both parties. The numerous post-2000 initiatives discussed earlier (and in more detail in Hodge, 2017) can be thought of as actions that together aim to help more countries and companies move into the Zone B space.

Zone C is the exact opposite of Zone B. Governments in Zone C are neither interested nor capable of delivering inclusive sustainable development: in the worst cases the state (at either the central and/or local levels) is controlled by self-serving warlords.<sup>10</sup> In this zone mining or oil companies that are 'rogues' focus narrowly on extracting a resource for the greatest possible profit, without concern for community, development nor environmental impacts. Such governments and companies both work to survive and to defend their own self-serving interests, and civil society is likely to be both weak, and repressed. Accordingly, we should not expect external interventions such as the EITI or those proposed by the NRGi to achieve any significant early improvement in Zone C situations. Nevertheless, helping strengthen progressive civil society organizations together with robust international action on transparency, corruption and money laundering—to

<sup>10</sup> At its worst, warlords act as 'roving bandits'—using the terminology of Olson (2000)—treating natural resources as only so much loot, and possessing little if any incentive to develop the territory which they (often temporarily) control. Predation rules, discouraging most investment, driving the economy downward, and thereby further tightening the resource constraint—with the excluded populace bearing the cost (Addison and Murshed 2005). This is inherently unstable politically.

begin to nudge the behaviour of companies and state actors towards improvement—might over time increase the prospects of a more inclusive development path.

The other two zones A and D are inferior to Zone B but offer more hope of progress than Zone C, since at least one of the two sets of actors favour reform and can work, with international assistance and initiatives, to try and alter the behaviour of the other. In Zone A an effective and development-orientated government can build institutions (at Levels 2 and 3) to reign in any rogue company; at the limit, withdrawing its license to operate (and if there are competing extractives companies, this should be at low-cost). Support from EITI, NREGI and other international initiatives, as well as civil society and the media, should be helpful here. International companies increasingly take heed of reputation and most are cognisant of their need to obtain and retain a social license to operate; as well as the need to respect ever more demanding international standards. We now discuss issues arising especially in Zones A and D in more detail in our next two messages.

## **9 Message 7: Delivering Effective and Inclusive Governance is Vital to Improving Outcomes in the Extractives Sector**

Looking again along the vertical axis of our framework diagram (Figure 2), countries will lie along a spectrum. At the worst end, exclusion is imposed by mass violence (warlordism) and, at the best end, inclusion is supported and achieved by good policy.

In between, are a variety of positions including (i) countries with systems involving *exclusion* (perhaps of indigenous communities) but tempered by an otherwise politically stable and prosperous society, and (ii) countries with governments that seek to improve inclusion but do so by driving public spending and debt up to unsustainable levels (an eventually self-defeating form of populism).

Nations and their governments can move up and down this spectrum: some may, via bad policy and bad politics, find themselves in the C or D zones and at risk of civil conflict (Venezuela today). Some may nevertheless have enough institutional robustness to pull back and recover (Zambia from the 1990s on; Zimbabwe, perhaps in the future). Others descend into civil war, which is both difficult to halt, and to recover from (presently: Libya, Somalia, South Sudan and Syria). Some can recover, but remain vulnerable and fail to reach the excluded with the politics around their resource wealth being a key obstacle (Algeria and Angola). Others pull themselves out of deep crisis (sometimes war), with help from the international community: Ghana starting in 1983, Mozambique in 1992, and Indonesia after 1998 (but may then run into economic difficulty years later: both Ghana and Mozambique today). Some make remarkable political transitions, but then stall (South Africa today). Some are written off as hopeless cases but then make surprising transitions back towards democracy (Nigeria and perhaps Myanmar).

This movement up and down the scale from exclusion to inclusion can be driven by exogenous economic shocks (price shocks especially). Resource booms, if handled well, provide new revenues and economic opportunities for strategies of inclusive development. Price collapses threaten inclusion if the resulting macro-economic adjustment is unduly borne by the poor; this risk is reduced if the country has saved some of the windfall in good years, giving it more fiscal room to manoeuvre (as Chile has done; see Solimano and Guajardo, 2017).

In discussing economic policy, states are often described as monoliths: acting with a single set of objectives, a single set of views, and a homogeneous voice. However, real-world states combine a

wide variety of actors, with different interests: those benefitting from the *status quo* (from exclusion for example) may be dominant for a while, but reformist elements can come to the fore within a government and the public administration. Anti-reformers can change their stripes when they recognize that their own political base is under threat from a sagging economy, rising grievances among the excluded, or a threat from another state that requires the government to mobilize the nation around a more inclusive agenda.

Smart reformers will craft broad coalitions, working with the ‘grain of society’ (especially its level 1 social norms and culture) in ways that may not be fully understandable to outsiders (hence donors should be wary of imposing themselves: there are plenty of examples of externally induced reforms that have stalled). Community-based organizations and NGOs can successfully widen the space of the political debate, leading to political openings that transform the possibilities for public action—around the rights of indigenous communities in mining areas for example. In these ways, actions at Levels 2 to 4 to create institutions for more inclusive development can very occasionally make headway, sometimes overcoming the powerful inertia at level 1. If successful, countries will move up the vertical plane in our Figure 2.

For analytical purposes, some helpful positioning of individual countries in the vertical plane of our framework diagram is possible using the metrics produced by the Natural Resources Governance Institute (NRGI) and its NRGI Index. For example, in the 2017 version of this Index the NRGI has ranked eighty-nine ‘countries’ (including double counting of countries with both minerals and oil & gas) that have a significant engagement with extractives in terms of the quality of their governance systems. It employs a scoring system that is used to classify these countries into five categories according to the assessed quality of their governance.<sup>11</sup> These categories are good, fair, satisfactory, poor and failing. The ‘good’ performing country is defined as one that ‘has established laws and practices that are likely to result in extractive resource wealth benefiting citizens, although there may be some costs to society’. A ‘failing’ country is described as one that ‘has almost no governance framework to ensure resource extraction benefits society. It is highly likely that benefits flow only to some companies and elites’. These two extremes could reasonably be thought of as indicating the highest and lowest points respectively on the vertical axis of our stylised diagram (Figure 2).

In the 2017 results only one MIC (but no LICs) are classified in the ‘good’ categories, namely Chile. But a number of mostly MICs are classified as satisfactory including (in order of their index scores) Brazil, Columbia, India, Indonesia and Ghana. Overall thirty-nine of the eighty-nine country cases are rated as ‘poor’ or ‘failing’ and these include a large number of other MICs and LICs. The ten failing countries include not surprisingly Zimbabwe, Mauritania, Myanmar, the Democratic Republic of the Congo (DRC), Equatorial Guinea, Sudan, Libya and Eritrea—mostly poor African economies. So there is a long way to go with so many countries closer to Zones C and D than to Zone B before the aspiration of Message 7 can be said to be achieved. However, even in difficult environments, politically-sensitized interventions have been able to achieve some progress as explained by Buckley et al. (2017).

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<sup>11</sup> The methodology is based around 149 questions and scores and subsequent expert review of three main areas of governance namely the enabling environment, revenue management and value realization. Within each of these three areas there are a total of fourteen sub-categories. See NRGI (2017: 7).

## 10 Message 8: Improving the Practices of Companies Can Now Draw upon a Great Deal of Accumulated Experience

In the horizontal plane of our framework diagram (Figure 2), companies range along a continuum from those that care nothing for social and environmental obligations (and may even deny that any such obligations exist: the only purpose being to turn a profit) to those that fully incorporate social and environmental objectives into their strategies and day to day operations. We term the former ‘rogues’, and the latter ‘enlightened’.

ICMM would claim, with some justification, that its twenty-five large multinational company members are in the socially responsible (‘enlightened’) category (as ICMM applies stringent membership criteria for corporate members, involving a rigorous admissions process followed by regular monitoring after admission).<sup>12</sup> Companies with a long history tend to improve their practices (environmental impact, workers’ rights etc.) relative to the norms of some 30-40 years ago; in part because they learn from past mistakes. Newmont, a founding member of ICMM, is one example.<sup>13</sup>

Many companies have responded to NGO campaigns, international public opinion, international initiatives—and their own self-analysis of the benefits of a ‘social license to operate’—by creating in-house sustainability departments, responsible for advising on the social and environmental impact of operations. The formation of the extractive industry associations, ICMM and IPIECA, is merely one aspect of this tendency. Today, the major mining and oil and gas companies that are ICMM or IPIECA members would claim to be socially and environmentally responsible. Since the turn of the Millennium there has been a clear trend for more enlightened corporate behaviours to emerge and this is well documented for the oil and gas industry by Tomlinson (2017). Some of the large Chinese mining companies operating outside China are also seeking to adopt very similar practices to those recommended by Western industry associations.<sup>14</sup>

In short, it has become harder to be a ‘rogue’ company in the extractives business. Over the last two decades, INGOs and civil society have pushed to increase awareness of irresponsible company behaviour (details of some of these pressures are discussed in Bell, 2017). Before the internet age, it was much easier for companies to get away with environmental and social damage, especially in the world’s remoter areas (including conflicts between miners and indigenous communities). Moreover, the goals of environmental sustainability and social responsibility are increasingly central to a growing class of financial institutions which provide ethical investment instruments to an increasing number of pension funds and private individuals. These investors are now highly influential in reshaping the extractives industry, notably via disinvestments in fossil fuels (especially

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<sup>12</sup> Additionally, ICMM has membership from thirty-four national and regional mining associations and global commodity associations. Through these associations it also connects to another 1,500 companies in the sector. <http://www.icmm.com/en-gb/members>

<sup>13</sup> Newmont had a relatively poor record of corporate social and environmental achievement in its mines in Papua New Guinea. However, when sustainability managers familiar with that record moved to work at a new Newmont mine in Ghana they resolved to establish very high standards. They achieved this, as evidenced by the mine’s early receipt of IFC capital funding, implying its compliance with the IFC’s rigorous standards. See also Filgueiras et al. (2017) on the case of Vale, the Brazilian company (which also has worldwide operations).

<sup>14</sup> In October 2014, the China Chamber of Commerce of Metals Minerals and Chemicals Importers and Exporters (CCCME) launched the Chinese Guidelines for Social Responsibility in Outbound Mining Investment at the China Exploration Exchange in Beijing. This has drawn some of its inspiration from the earlier ICMM arrangements.



coal), and in requiring manufacturers to source materials and metals from ethical supply-chains that avoid environmental damage and human rights abuses such as child labour (Addison, 2018).

The sector has come a long way in recent years and many companies are probably now positioned somewhere to the right of the vertical dividing line in Figure 2. Nevertheless, even as a reputation for environmental and social responsibility becomes an increasingly important determinant of company valuations over the long-run, some individuals down the chain of corporate management may still face pressures to downplay the environmental and social footprint of their companies. At the highest levels of management, the drive to maximize shareholder value on an annual basis (exacerbated by linking CEO remuneration to the company's share price, combined with a rapid turnover in top management) can lead some companies into behaviours that dilute their standards (thereby risking both minor and major catastrophic events); neglect the quality of their supply chains; and even use corrupt methods to secure access to mining and drilling rights on favourable terms.

Periods of price weakness, such as those after 2011, when companies looked to cut costs, can also weaken corporate commitments to their sustainability and social impact agendas (especially when the responsible departments have been downsized). In such times, marginal mines are likely to be mothballed, shut down or sold (perhaps to companies having weaker environmental and social commitments than the previous owners) and tax and royalty payments are likely to be reduced.<sup>15</sup> A big question therefore remains on the table: how to build robust mechanisms and company cultures that keep sustainability and social impact agendas to the fore—and irrespective of management turnover and market fluctuations.

The toughest challenges face companies working in Zones C and D of Figure 2 (countries characterized by ineffective and divisive government). Autocracy and national resource wealth often go together, given the large personal fortunes to be made via control of the state. Some autocracies have capable states, but many have states incapable of delivering even the most basic of services (note the NRG definition of 'failing' given earlier). This poses a dilemma for any socially-responsible company. It may decide to live with the situation, perhaps providing some benefits to local communities when the central and/or local governments are disinterested in, or incapable of doing so. There are now many examples in which communities see extractives companies as quasi-government agencies, expecting them to provide public goods that are otherwise unavailable from their own governments. This can have significant financial implications for the companies. When autocratic governments commit human rights abuses, extractives companies risk their reputations by continuing to operate in the country; examples have included Indonesia's Aceh province and Nigeria's Niger Delta (Coll, 2013).

An enlightened company might nonetheless achieve localized benefits (increased local employment and infrastructure provision for communities around the mine site, for example). If an otherwise self-interested government and public administration contains at least a few progressive elements, then there is scope for an enlightened company to work with those progressive elements and also with community groups, with NGOs and perhaps with like-minded donors to achieve at least a modicum of localized improvements. This can increase the country's chances of reaching a better future (Zone B).

The worst dilemmas occur when the country is in civil conflict and war. Access to rights for the exploration and export of valuable minerals and oil can then be highly personalized. Some

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<sup>15</sup> For some metals, the statistical data suggest that lower royalty payments as well as lower wage bills were indeed one important element in the cost-cutting that companies managed to achieve: see ICMM (2016).

international companies may decide to avoid the country entirely (even if international sanctions do not actually prohibit their engagement). Others may face the moral dilemma of either abandoning well-established mines and loyal workers or staying the course despite the reputational and other problems this may pose for them. Some less enlightened companies (i.e. in Zone C) may find the riches too tempting, and so cut deals with the government, its officials, or warlords who control the relevant territory. State officials and warlords often create their own domestic businesses to profit in this way. Still others profit from offering protection to miners. Some of Africa's alluvial mining is linked to networks of organized crime.

Statements about the potential for progress from Zones C and D to Zone B are necessarily speculative and highly contingent, but they should be a crucial part of the overall improvements for extractives and development that most people seek. Such progress in the resource sectors depends on shifts in the broader political and economic climate of the country. Game-changers include: a move from authoritarianism to democracy (and whether stability is maintained); the nature of the political settlement that ends a violent conflict; the creation of multi-party democracies that are not simply covers for old (or new) authoritarian elites; and whether new governments take firm action to reduce the 'horizontal' and regional inequalities that feed grievances, including conflict over the distribution of resource wealth (Addison 2009, 2012; Stewart 2009). The hand of both enlightened companies and donors will be strengthened if the self-interested elite, or elements within it, become convinced that a more inclusive development path can secure their futures. But there is no one lever that can be pulled to yield such success. And promising transitions can stall (Myanmar today).

## **11 Message 9: There Are Now Many More Ways in Which Interventions by External Stakeholders, Especially Aid Donors, Can Improve Outcomes**

With the increase in attention by the international community (donors and NGOs) to the extractive industries since the Millennium, there has been a veritable sea-change in the quality and breadth of understanding of the challenge of turning resource wealth into inclusive and sustainable development. This has encouraged a vast array of new initiatives—many of them international but others purely local. As already noted, Hodge (2017) identifies at least 46 specific initiatives—nearly all initiated since the Millennium—and additional to the many reforms in the formal legal and regulatory systems of individual national governments. This remarkable change in the situation warrants far more comment than it has received thus far.

Most of the new international and local initiatives relating to mandatory or voluntary improvements in the industry's regulation, involve donors as significant players, and have potential traction over one or both dimensions—government and corporate - of our framework diagram (Figure 2). The Natural Resource Charter, for example, provides a coherent set of protocols to help governments understand better the various component tasks that they face. The benchmarking framework now managed by the NRGI is an especially powerful diagnostics tool that helps assess where institutional and other improvements in public policy are most needed. Companies can also draw on a substantial body of external guidance, provided by the International Finance Corporation (IFC) (with its detailed Environmental and Social Performance Standards), together with the ICMM and China's CCCMC. Some of these standards have serious teeth: they can grant or deny access to loan and equity finance in the case of the IFC standards. The EITI for its part gives guidance to both companies and governments about the better custodianship of the fiscal revenues and royalties from extractives activity. Although these initiatives have come in for criticism, there seems little doubt that their collective influence has been considerable at least in the most conducive county situations (those represented as Zone B of our framework diagram).

Finally, the powerful voices of some NGOs are also exerting a significant influence on some policy decisions (see Slack, 2017).

At the level of **national governments** there is often a need for greater recognition of the very broad range of mainly new international initiatives that these host governments can draw on to boost their own regulatory efforts should they choose to do so: from aid donors, companies and NGOs. In combining their sovereign right to regulate their own extractives sector with some of these external supports, there is also a case for adopting a coordinated ‘all of government approach’. The objective of using extractives to stimulate eventual diversification of the economy must recognise the broad range of government ministries and agencies that are needed to attain that long-term objective. So, the interfaces with the external players that are of relevance to the extractives industries should not be narrowly construed to involve only the ministries of mines and petroleum: but also, those of labour, health, education etc. (Witter and Jakobsen, 2017).

The initiatives and standards originated by **extractives companies** are increasingly being refined and applied more broadly and these can also be of great assistance to a receptive host country government. However, there are still some important further steps to be taken by most companies to embed their work into a comprehensive framework of ‘contribution to host societies’ that embraces broad concepts of both *sustainability* and *sustainable development* and that can also be challenged by becoming more amenable to rigorous comparison (across companies and countries), as well as to monitoring and evaluation (see for example Mondoloka, 2017, Macdonald, 2017b, and Hodge, 2017).

Many extractives companies now address their **responsibilities to local communities** where they operate by reference to coherent frameworks of ‘good practice’. However, there is room for major improvements in the specifics and consistency of actual practice on the ground. There is also a rising call for a greater reliance on formal legislation, regarding the duties of extractive companies to local communities rather than the voluntary approaches that have so far been more common (Otto, 2017b).

**Donor agencies** were slow off the mark but are now beginning to support innovative new ways in countries to address governance weaknesses of relevance to extractives including in the less propitious ‘failing’ environments identified in our framework diagram above (e.g. those in areas lower than Zone B. See also the chapter by Travis et al.). Donors have collectively come up with many innovative ideas. These have increasingly been supported in various ways by the corporate players and by various NGOs. As one example, for some years mining companies led by ICMM have suggested that donor agencies can have a significant role to play in a variety of partnerships involving host governments, local communities, NGOs and also the extractive companies themselves. ICMM (2010) identified and discussed five<sup>16</sup> main sets of partnership arrangements all involving some combination of these various partners, and documented the success factors and other elements in some thirty specific cases.<sup>17</sup> These five sets were:

- Mining and Poverty Reduction; with six specific documented examples for countries such as Indonesia, Peru and South Africa. The Indonesian example involved a partnership

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<sup>16</sup> A sixth set described in that publication, namely dispute resolution, is not discussed here because the identified examples did not involve specific roles for donors.

<sup>17</sup> Subsequent to the 2010 publication ICMM also refined and re-issued its Mining Partnership for Development Toolkit which offers many general principles as well as further country-specific examples that continue to be added to through new in-depth country case studies (ICMM 2011).

between Freeport Indonesia, USAID and PADA<sup>18</sup> with the Catholic Church also playing a role.

- Mining and Revenue Management; with examples from three countries one of which is Ghana: a good example of the multiple partners involved in an EITI implementation.
- Mining and Regional Development; with examples from three countries including Madagascar where Rio Tinto partnered in projects with the World Bank
- Mining and Local Content; with examples from seven countries including Mozambique where BHP Billiton partnered in various ways with the IFC.
- Mining and Social Investment; with examples from six countries including South African where Anglo American partnered with PEPFAR<sup>19</sup> and a number of local NGOS.

In addition to a role in some or all of these areas, a few donors have started to engage more explicitly with the difficult *political economy* issues that are involved with policies for extractive industries, and in the process have experimented with novel tools and modes of engagement. The United Kingdom's DFID can claim a leadership role in this area with its innovative projects in Nigeria (FOSTER)<sup>20</sup> and Ghana (GOGIG)<sup>21</sup> and more recently in Kenya. The assessment of the FOSTER example in Buckley et al. (2017) demonstrates (i) how a regularly updated political assessment is essential to understanding the underlying incentives of key actors and whether possible new interventions may work; (ii) how interventions need to be 'locally led'—not necessarily government led but instead by relevant parts of civil society—in order to provide sufficient legitimacy to the reform effort; and (iii) how any interventions need to be flexible and adaptive in order to deal with a context that can change quickly. Additionally, their analysis illustrates that to take on any explicit role involving political economy, donors must be prepared to accept a certain degree of risk since the connection between inputs of effort and outcomes cannot be assured.

Finally, in reviewing the underpinnings and some of the main messages of this book we need to confront arguably the most challenging issue that today confronts the extractive industries and the countries who host them: climate change.

## **12 Message 10: Climate Action Will Create New Winners and New Losers among the Extractives Sectors**

Atmospheric concentrations of carbon dioxide are now at levels last experienced on earth some 800,000 years ago when the temperature was 2°-3°C warmer, and the sea level was 10-20 meters higher, than it is today (WMO, 2017). Meeting the international target of avoiding a more than 2°C global temperature rise requires emissions of carbon dioxide, methane and other greenhouse gases to peak within the next few decades, and the world must then achieve zero net emissions (IPCC 2015). Whether the world can meet this challenge while simultaneously ensuring the continued growth of global prosperity, and the reduction of poverty, will define much of the

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<sup>18</sup> Papuan Agribusiness Development Alliance.

<sup>19</sup> The US President's Emergency Plan for AIDS Relief.

<sup>20</sup> The Facility for Oil Sector Transparency and Reform.

<sup>21</sup> Ghana Oil and Gas for Inclusive Growth.

character of the rest of this century. Failure puts the planet at risk of catastrophic climate change and rising levels of poverty.

The extractives sector is central to this unprecedented challenge. In the history of humanity's search for new sources of energy, the long era of fossil fuels is entering its last stages, and a new era—that of renewable energy—is beginning (IPCC 2015; Stern 2015; Addison 2018). This new era is already seeing increasing demands for those metals and materials needed for renewable energy systems, as well as zero-carbon buildings and new forms of transportation. Some of this increase can be met by increased rates of recycling, but much will have to come from new supplies. The challenge for the mining sector, and for nations endowed with the resources in question, is to increase mining while ensuring that the sector's own emissions are contained (including switching to renewable energy for its power needs), protecting the local environment (especially the renewable resources of waters, forests, soils and other components of the ecosystems that underlay sustainable development), and managing the other social impacts. Achieving all of this will be an important determinant of whether commitments to reduce emissions (the 2015 UN Paris Climate Agreement), together with commitments to the UN's Sustainable Development Goals (SDGs), are fully realized.

Countries with reserves of metals have a bright future. Thus, while copper and nickel experienced significant price falls after 2012 (and a partial price recovery since then), the need for such metals is set to grow, largely irrespective of the exact mix of renewable energy and transportation technologies that evolve. Recent price forecasts indicate a 20 per cent increase in the copper price in real terms over the next ten years (World Bank 2016). Battery storage, to overcome the intermittency of supplies of electricity from renewable energy sources and to replace the internal combustion engine in vehicles, will be important to the demand for nickel, but especially important for the rarer metals of cobalt and lithium (the prices of which rose strongly over 2017 as supply lagged demand, especially from manufacturers of electric vehicles). The most thorough study to date of the implications of the low carbon future for minerals and metals, concludes that: '... the technologies assumed to populate the clean energy shift—wind, solar, hydrogen, and electricity systems—are in fact significantly MORE material intensive in their composition than current traditional fossil-fuel-based energy supply systems' (World Bank 2017: xii). Africa is especially mineral-rich, and can expect high and rising demand as the technologies of the low-carbon future are highly materials-intensive.

So, making the link with our Message 2, there is clearly a major opportunity for some LICs and MICs to use extractives more fully than in the past, and thereby to achieve the accelerated development in the ways discussed in this book. But there are also serious concerns, as discussed more fully in Addison (2018). Countries and companies expecting to meet increasing demands for both base- and rarer- metals by raising their extraction and production levels may find it difficult to do so while at the same time reducing their own emissions (especially when ore grades are low). Large investments in mining together with supporting infrastructure are required to achieve this balancing act. However, many countries with large reserves of minerals, also have very weak governance which holds back investment; thus constraining their ability to participate in any future mineral boom associated with the accelerating uptake of low-carbon technologies. Consequently, it is an open question whether most citizens of such countries will benefit from any boom; the history of extractives sectors in fragile states (e.g. Zone C and D countries) has largely been one in which the ruling elites are able to capture a disproportionate share of the gains. The supply-chains for some of the minerals are characterized by human rights abuses (such as the use of child labour), notably that of unregulated artisanal mining of cobalt in the DRC (which has the world's largest reserves). Those supply-chains need to be embedded in much better frameworks of governance and transparency.

While the cost of renewables is falling at a faster rate than expected, fossil fuels will still be necessary to energy production for many years to come (and overall fossil fuels still enjoy subsidies that exceed the level of support to renewables). Natural gas is taking over from coal as efficient gas-fired power stations have less than half the emissions of coal (and coal is responsible for much of the drastic deterioration of air quality, especially in China and India's big cities). At the same time, there are still big environmental concerns around natural gas (notably shale gas). Yet many energy decision makers do see it as an energy 'bridge' to a renewables future, albeit one that must end in less than two decades if international emissions targets are to be met. Many countries with large oil and gas reserves still cling to the hope that prices will recover their all-time-highs of recent years, but the headwinds against oil and gas are strong, not least from international action on climate change. With the notable exception of the Trump administration, signatories to the Paris Agreement remain committed, and indeed China sees a vast commercial opportunity in the technologies of the low-carbon future. However, countries with reserves of fossil fuels run the risk that they will be unusable, and they must surely reduce the vulnerability of their public finances by expanding their tax bases, and doing more to develop new economic sectors.

### **13 Conclusions**

UNU-WIDER has undertaken a large amount of research on the extractive industries, as part of the 'transformation' theme which has been a major pillar of UNU-WIDER's overall 2014-18 research programme (and is also of great relevance to the other two pillars of UNU-WIDER's work, namely 'inclusion' and 'sustainability'). A major concern of the Institute is to focus on the questions of most relevance to policymakers in the developing world, and to their development partners. How to manage a nation's resource wealth is without question one of the biggest issues that policy-making in the LICs and MICs face. Getting it right can yield enormous benefits, both for the public finances—and therefore for the expansion of public services and infrastructure provision—but also in enabling structural transformation of economies in ways that increase employment and livelihoods, thereby reducing poverty. But getting it wrong can lead to serious economic, social, and environmental impacts that can be difficult to reverse. The UNU-WIDER project discusses the many lessons that have been learned in the past few decades, the traps to be avoided, the ways forward, and the new opportunities.

There are many challenges for resource-rich countries. It is not just governments and their international partners that drive the process of change, but also the extractive industry itself, communities, and their NGO and INGO partners. The UNU-WIDER project recognizes the severe difficulties of achieving positive change that are often encountered in resource-wealthy nations; we are 'realistic optimists'. The project focuses on recommendations that might, but are certainly not guaranteed, to work in delivering inclusive and sustainable development. We are keen to identify actions, policies and institutions, that are potentially transferable across countries, with suitable adaption to local circumstances. Overall, our expectation is that strategies and practices around the extractives sector can improve—but not without a struggle.

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