

Flagship Report Paper Series

Paper 1: A framework – Human development and the links to natural resources



AFRICAN DEVELOPMENT BANK GROUP

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Preface

History shows that an abundance of natural resources does not necessarily improve a country's human development. How can governments turn new discoveries of natural resources into outcomes that matter for their citizens – including better health, better education, and access to quality social services?

Most governments have expressed a commitment to turn revenues from new natural resource discoveries into outcomes that matter for their citizens: better health, better education, and access to quality social services. They also want to make sure the discovery of extractives translates into more and better jobs and business opportunities. Yet they are also aware that delivering on those commitments demands tough and sometimes complex policy choices, including balancing the need for social sector investments with the needs of other sectors across the economy, being transparent and carefully managing citizen expectations, and adequately distributing benefits both between extractives and non-extractives communities and between current and future generations.

In light of these challenges, the African Development Bank (AfDB) and the Bill and Melinda Gates Foundation (BMGF) came together to produce a joint Flagship Report: *'Delivering on the promise: Leveraging natural resources to accelerate human development in Africa'*.

This paper is one of a series of eight in-depth technical background papers which supported the development of the flagship publication. While each background paper can stand alone, they also build on each other. Paper 1 sets out a framework for understanding four key channels through which natural resources can translate into improved human development: 1# public spending on health, education, and social protection; 2# public spending aimed at fostering growth and economic diversification; 3# industry spending on infrastructure, procurement, skills, and employment; and 4# companies' spending on social investments. Paper 2 estimates the likely timing and magnitude of revenue from new discoveries of oil, gas or minerals in six African countries: Ghana, Liberia, Mozambique, Sierra Leone, Tanzania, and Uganda.

The next three papers examine the public spending channels described in the first paper. Paper 3 discusses the macroeconomic risks and policy choices associated with an influx of new revenues from natural resources. Paper 4 explores the potential of new revenues to improve health and education services, comparing the expected scale of revenues to financing needs in the six featured African countries and introducing a diagnostic framework for policy choices. Paper 5 looks at the case for using new revenues to fund basic social protection programs, including the potential to boost demand for health and education services.

The final three papers examine the industry activity channels described in Paper 1. Paper 6 looks at how policies on local content can leverage spending on extractives industry projects to create more broad-based economic growth. Relatedly, Paper 7 explores the policy choices involved in leveraging extractives projects to build skills and human capital. Finally, Paper 8 asks how governments and industry can maximize the human development impact of companies' social investment, a relatively small but potentially important part of company spending in extractives industry projects.

To access the Flagship Report and the other seven background papers presenting complementary in-depth discussions of the policy choices described in this paper, readers are encouraged to consult the dedicated website at: www.NaturalResourcesForHumanDev.org.

Paper 1 – A framework: Human development and the links to natural resources

Paper 2 – Timing and magnitude of new natural resource revenues in Africa

Paper 3 – Natural resource revenues and macroeconomic policy choices

Paper 4 – How to use natural resource revenues to improve health and education in Africa

Paper 5 – How to use natural resource revenues to enhance demand for public services through social protection

Paper 6 – Creating local content for human development in Africa's new natural resource-rich countries

Paper 7 – Leveraging extractive industries for skills development to maximize sustainable growth and employment

Paper 8 – Extractive industries and social investments: Principles for sustainability and options for support

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Disclaimer

This series of papers focuses on one part of the extractives debate and reflects research gaps identified by the contributors within their areas of expertise. The contributors are not held responsible for the views expressed in this report. This paper is based on research, analytics, and expert consultations completed during the writing of the eight background papers. However, this paper should not be considered as an alternative to in-depth technical expertise. Any mention of

specific entities, individuals, source materials, trade names, or commercial processes in this publication does not constitute endorsement by the AfDB or the BMGF.

Key messages

- **Extractive industries projects have the potential to contribute to human development, but this is not guaranteed.** It requires strategic planning and policy choices based around individual country contexts to translate natural resources into individuals living longer and healthier lives, gaining a good education, and having a decent standard of living.
- **The scale of natural resources to be exploited in our sample countries is significant enough to boost the economy.** However, revenues from these natural resources will not be permanent or sustain high incomes on their own. To make the most of the opportunities offered by recent natural resource discoveries, a primary focus for successful development will be the choice and quality of policies made by governments before and during production.
- **Extractive industries can impact human development outcomes through both public spending and industry activities.** While most attention is focused on government spending of the revenues generated by the sector, the spending of extractives companies themselves can also be harnessed for human development through the right public policy choices.
- **Public spending of government revenues from extractives projects can enhance human development either directly or indirectly.** Direct routes include spending on health, education or social protection, while indirect routes include spending on infrastructure or economic growth. Both channels are important and the balance of expenditure between the two depends on the country context and the expected time profile of natural resource revenues.
- **The finite nature of natural resources means some revenues need to be channeled toward generating long-term, broad-based growth.** Direct spending (e.g. on schools and hospitals) can provide a quicker boost to human development in the short term. However, the recurrent costs of such investments mean they can be sustained in the long term only by an economy strong enough to survive the exhaustion of natural resources.
- **Two kinds of spending by extractives companies can enhance human development – on project activities themselves and on social investment.** Industry spending on capital and operations typically accounts for around 50–65 per cent of total expenditure in mining and 40–50 per cent in oil and gas – more than the revenues that accrue to governments. Social investment by extractives companies in local areas accounts for only around 1 per cent of overall project spend, but tends to directly target human development.
- **Impact can be amplified by government policies and practices.** Policies facilitating access to new infrastructure, sourcing from local companies, and employment of local people can harness industry spending on capital and operations for human development. Alignment of public policy with industry social investment (e.g. building of schools and hospitals or and business development initiatives) can maximize its impact.

- **The channels linking extractives projects to human development vary in relative importance at different project phases.** Public spending channels become important during a project's operations phase, when it starts to generate revenue for government. Before this, during the planning and construction phases, the government will need to consider how to enhance the human development potential of industry activities.
- **Governments in our sample countries need to consider their policy choices broadly and carefully.** Decisions will depend on the priorities and objectives at the individual country level, and on the degree to which the preferences and aspirations of the population are accurately reflected in the national planning process.

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List of abbreviations

AfDB	African Development Bank
BMGF	Bill and Melinda Gates Foundation
CIREP	Inter-ministerial Commission for TVET Reform (Mozambique)
COREP	National Public-Private Commission for TVET Reform (Mozambique)
CTA	Confederação das Associações Económicas de Moçambique
DRC	Democratic Republic of the Congo
GIZ	Gesellschaft für Internationale Zusammenarbeit (Germany)
HDI	Human Development Index
ICMM	International Council on Mining and Metals
ISO	International Organization for Standardization
OPHI	Oxford Poverty and Human Development Initiative
OPM	Oxford Policy Management
R&D	Research and Development
TFM	Tenke Fungurume Mining
TVET	Technical and Vocational Education and Training
UNDP	United Nations Development Programme
ZCCM	Zambia Consolidated Copper Mines Ltd.

1 Introduction

Success or failure in managing prospective natural resources will depend on a series of decisions made by government: not just in terms of policy choices on how to spend revenues, but the rate at which spending is managed and how the broader potential benefits from extractive industry investments are harnessed.

To support human development we consider two key opportunities resulting from extractive industry activity. Improvements to human development can be achieved through:

- **Public spending channels:** improvements result from increased public spending financed through government revenues received from extractive industries. Public spending can target human development directly (through social spending) or indirectly (through spending to enhance economic development).
- **Industry activity channels:** improvements result from the activities undertaken by extractives companies themselves. These include core commercial activities (e.g. employment, procurement, and infrastructure investments) and social investment activities.

The objective of this paper is to provide a framework for understanding the potential links from natural resource wealth to improvements in human development outcomes.

The paper is structured as follows:

- Section 2 provides a framework for understanding the various channels through which improvements in human development can be achieved, either through public expenditure directly on social services and indirectly on growth-enhancing infrastructure or through coordination of the broader impacts of extractive industry operations.
- Section 3 discusses specific case studies that illustrate the lessons learned from both failed and successful attempts to harness natural resource wealth for human development.
- Section 4 draws on the lessons learned from other natural resource-producing countries to provide a set of recommendations that can guide our sample countries in their pursuit of improved human development outcomes.

2 Improving human development in the context of natural resource wealth: A framework

The presence of an extractives industry can have a major impact on human development in natural resource-rich developing countries. However, this contribution is not guaranteed. The existence and size of these impacts depend to a large extent on the actions of the private sector and, critically, of the government.

There are a number of channels through which extractive industries impact on human development. The channel that has received the most attention relates to public spending of the revenue derived from natural resources by government. While this is undoubtedly an important channel, the framework outlined in this section goes beyond it to outline opportunities that arise from other areas of spending made by private companies that can be enhanced by appropriate public policy.

We start by providing a definition for human development that is broadly accepted by international consensus and incorporates the notion of human wellbeing in addition to economic prosperity. This is followed by a framework for considering how natural resource wealth can be used to improve human development.

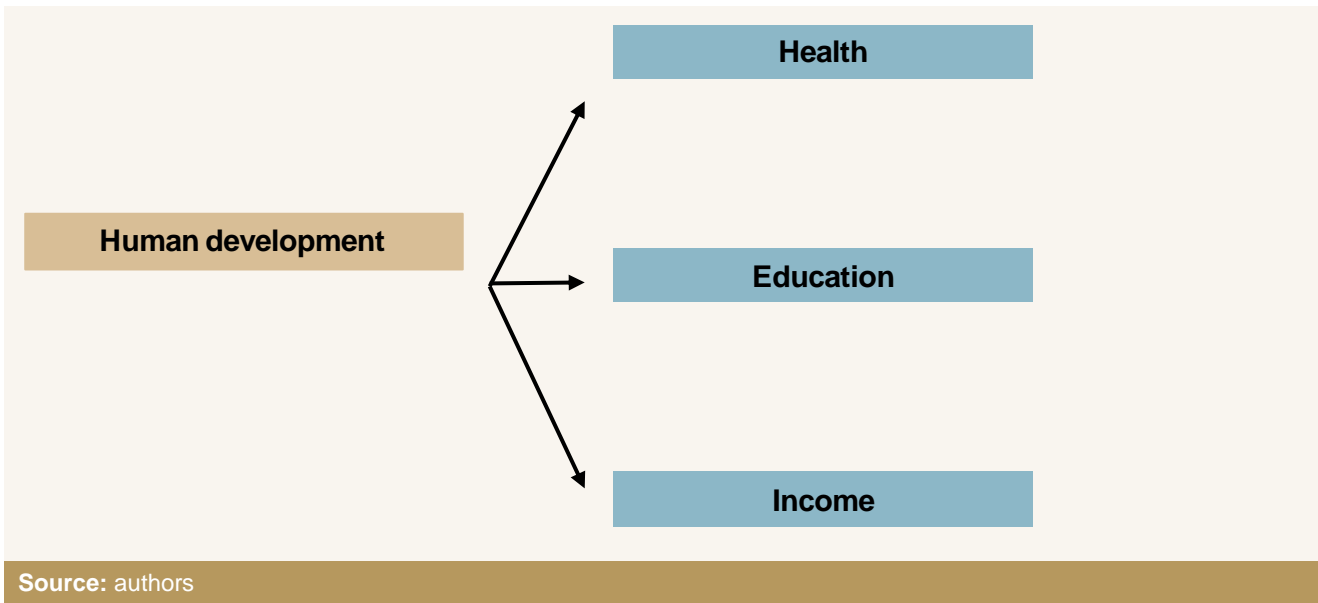
2.1 Defining human development

Many definitions of human development have been proposed and used by theorists and organizations to compare countries' progress across time and with each other. The Oxford Poverty and Human Development Initiative (OPHI) states that, 'Human development is a process of enlarging people's choices. The most critical ones are to lead a long and healthy life, to be educated and to enjoy a decent standard of living.' (OPHI, nd) Another commonly cited measure is the United Nation's Human Development Index (HDI), which combines national income per capita with simple proxy measures for health (life expectancy) and education (years of schooling) – three dimensions depicted in Figure 1.

OPHI's Multidimensional Poverty Index combines a series of different human development metrics such as the proportion of households with a child of school age who is not in school, an under-five child who is lagging behind on weight-for-age, and access to electricity and improved sanitation and drinking water.

Despite their differences, what all of these definitions have in common is that they recognize that monetary measurements – such as national income per capita or the number of people living on a dollar a day – alone do not capture all outcomes worth caring about for societies and individuals. Such is the premise of this series of papers: it asks how can extractives resources be leveraged to fast-track the human development agenda and thus enable broad-based, equitable, and sustained growth?

Figure 1: The three dimensions of human development



The three dimensions identified in Figure 1 indicate that efforts in several areas of public policy are required to bring about improvements in human development. The most obvious include investments in the social sectors of health and education as the most direct means to improve the first two dimensions.¹ Influencing the third dimension and ensuring that individuals have the means to secure a minimum level of income is more complex and requires policies dealing with a variety of areas ranging from social protection interventions to economic policies to enhance growth and promote diversification of the economy.

2.2 Linking extractive industries to improvements in human development

Extractives projects are large. They range from several hundred million to several billion dollars' worth of investment. The human development impact potential from extractive industry projects depends on the size of the investment as well as the location. In a developing country context, extractives investments are often large relative to existing economic activity. While these projects have a large and direct economic impact, they also have the ability to influence human development both directly and indirectly in a number of ways.

Firstly, extractives projects have the potential to generate large amounts of **revenue for government**. This additional revenue is then available for public spending in areas either directly related to human development (such as health and education) or indirectly related (such as social protection, infrastructure, or economic diversification strategies). Both areas of spending have the potential to enhance all three dimensions of human development – by directly targeting health and education or indirectly targeting income.

¹ Recognizing the caveat that the relationship between public spending and health and education outcomes is not a linear one. Firstly, this is because much of the spending is private. Secondly, this is because health (and to a lesser extent education) outcomes are a function of a large number of factors other than personal and public health interventions.

Secondly, the **investments and activities of extractives companies themselves** also have the potential to improve human development outcomes and these can be enhanced by appropriate public policy. Firstly, there are a number of core business activities undertaken by companies that have the potential to indirectly influence human development through the income dimension. These include the **jobs** created directly by projects as well as those created indirectly through the supply chain as companies **procure** goods and services. Critically though, these two areas depend on the availability of local skills the enhancement of which may require intervention from government. Investments in upgrading or building **infrastructure** in remote areas also have the potential to indirectly influence human development through the income dimension by connecting remote areas to the rest of the country. A second area of company spend with the potential to influence human development is that of the **social investment** activities companies carry out in surrounding communities. This community spend often targets all three dimensions of human development – health, education, and income – at a local level.

The first of these areas – government revenue – has traditionally received the most attention in debates about the sector’s ability to influence human development. But, as the next section argues, the non-government expenditure channels of company spend also have the potential to enhance human development.

2.2.1 Channels through which project spend can impact human development

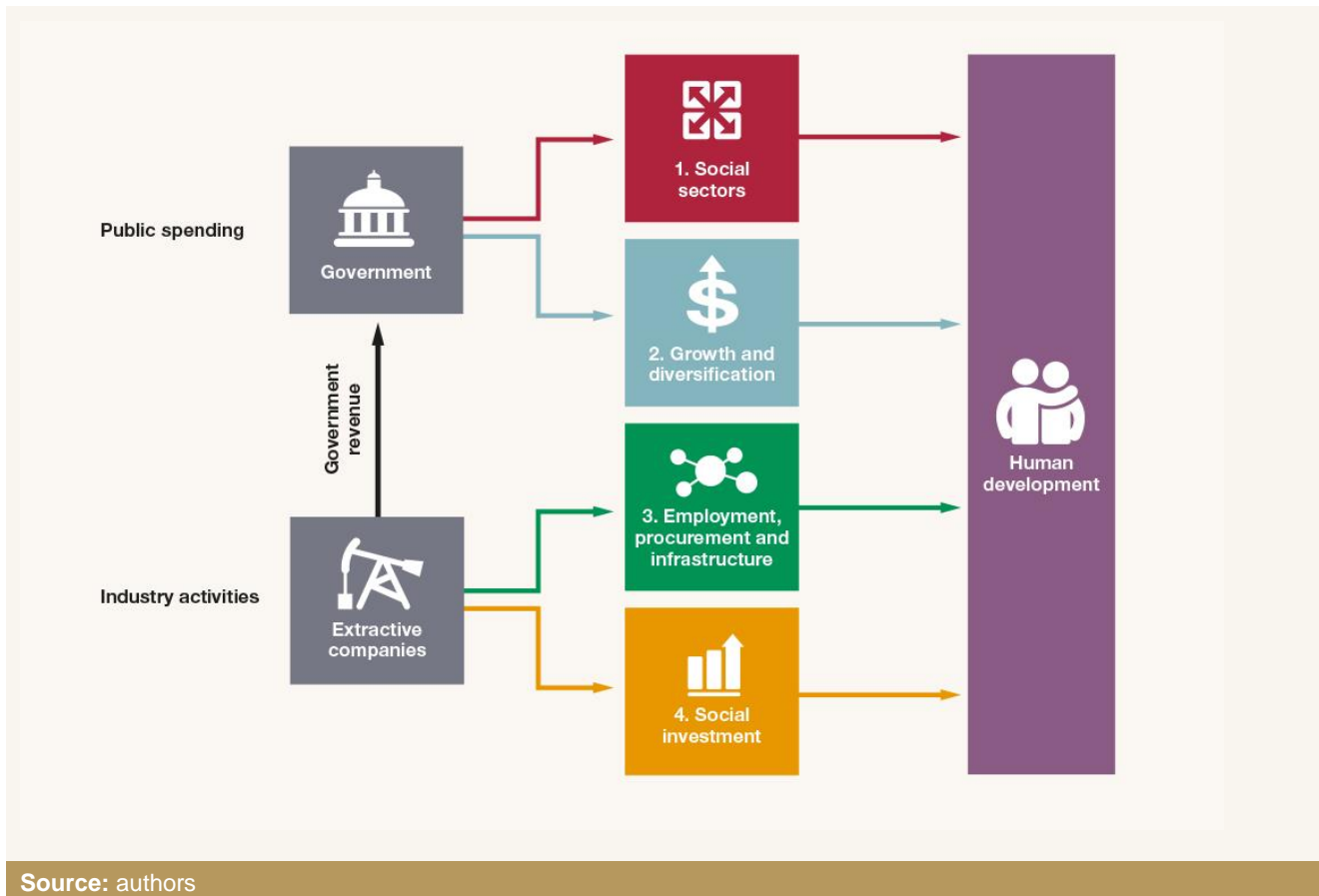
Figure 2 below provides a stylized summary of the main channels through which extractive industries have the potential to influence human development. The starting point for all channels is the ‘extractives companies’ box.

As Section 2.2.2 outlines in more detail, money spent on a large extractives project is allocated across four main categories (government revenue; employment, procurement and infrastructure; social investment; and investor returns). The first three categories have the potential to influence human development and are shown as arrows originating from the ‘extractives companies’ box (and color coded to match the pie chart in Figure 3).

The black arrow from the ‘extractives companies’ box shows the revenue government receives from companies which links to the **‘public spending’ channels** through which human development can be influenced. Public spending can be directed at areas that directly influence human development (i.e. social sectors) or those that indirectly influence human development (i.e. ‘economic development’).

The orange and green arrows do not go through government and therefore make up the **‘industry activity’ channels**. These include spending on employment, procurement, and infrastructure (all of which have the potential to enhance human development), as well as social investment (which can influence human development at a local level). Each of these channels is discussed in more detail in Section 2.3.

Figure 2: Extractive activities and human development: the main channels



Source: authors

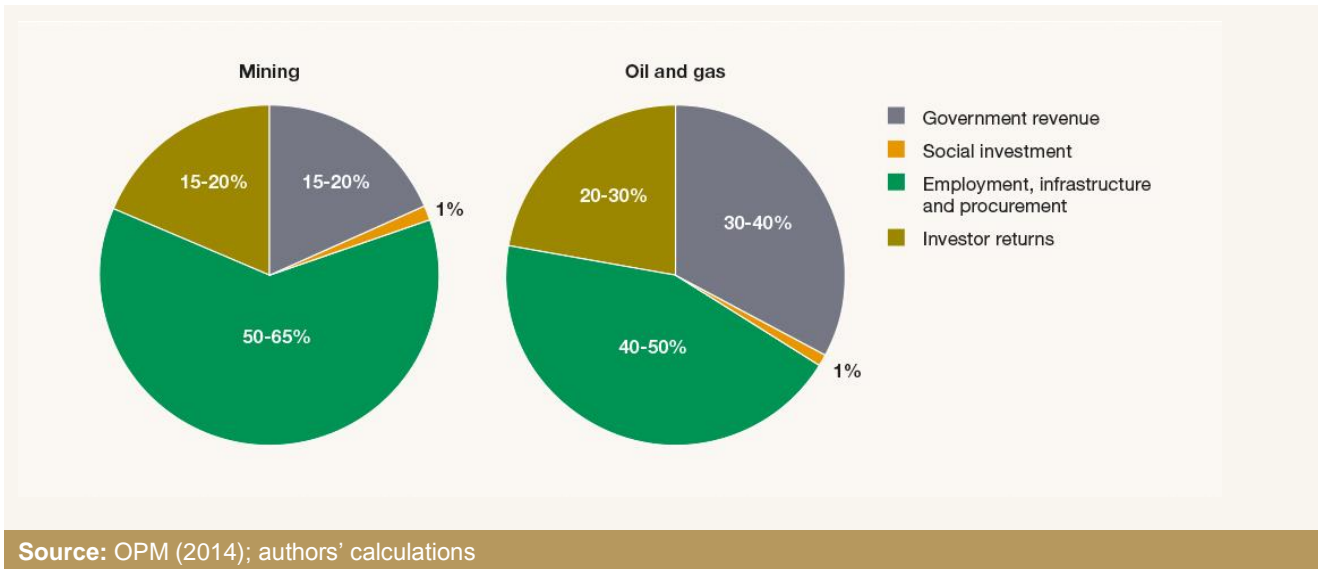
2.2.2 Allocation of project spend

Figure 3 shows the typical allocation of project spend by companies in the mining sector and the oil and gas sector. The money spent by companies on extractives projects is split between four main areas:

- **Government revenue** (money paid to government which forms part of overall government revenue. This includes all taxes paid and any additional government payments in the form of royalties and profit share);
- **Employment, procurement, and infrastructure** (spending on core commercial activities undertaken. This includes all investment in infrastructure, the procurement of goods and services and payment of employees' salaries);
- **Social investment**² (money allocated to social investment activities for the benefit of surrounding communities); and
- **Investor returns** (payments made to investors, interest payments, and amortization of loans).

² This is sometimes referred to as 'CSR' or 'community spend'.

Figure 3: Share of spending in extractive projects



The fourth category (investor returns) has little potential to influence human development but the first three categories all do. Figure 3's depiction of the allocation of company spend in each industry across these three areas of significance illustrates four important points:

Firstly, there are differences in the allocation of project spend between the two industries but these are not dramatic. Government revenue makes up a relatively larger proportion – and employment, procurement, and infrastructure a relatively smaller one – of overall project spend in the oil and gas industry compared to the mining industry.

Secondly, the share of companies' spending allocated to government revenue is large but it is not the largest allocation. The potential for positive human development outcomes from the government spending channel is the most obvious, but the large allocation of project spend in other areas indicates that serious consideration needs to be given to understanding whether these spend areas can be leveraged to enhance human development outcomes.

Thirdly, in both industries the largest proportion (sometimes more than half) of the project money goes toward core commercial activities such as employment, procurement, and infrastructure spending. All offer opportunities for enhanced human development. The large amount of money spent in these areas could translate into improved human development if these investments are harnessed in the right way.

Finally, the smallest component is that allocated to social investment. However, as this tends to target local areas, this spend can be significant at a local level. Companies' social investment expenditure includes spending in areas related to all three dimensions of human development including health, education, and areas related to the income dimension (e.g. livelihoods support, skills development, and enterprise training). At around 1 per cent, the spending in relation to the overall project at a national level is small but the potential for positive human development outcomes at a local level is large.

2.2.3 Timing of project spend

Section 2.2.2 outlined the allocation of project spend by companies across the full life of an extractives project. In order to understand the potential for human development impacts, it is also important to understand the timing of this expenditure across the project lifecycle as the allocation differs at different points in time. Extractives projects follow similar lifecycles and these are shown in Figure 4. Several years are spent on the exploration and planning phases. The construction phase also takes several years (ranging from two to five). The operations phase is usually much longer – spanning several years to several decades. Closure takes between two and five years.

Figure 4: Extractives project lifecycles and relevant policy areas



The most important phases in terms of the potential for positive human development impacts are the construction and operations phases.

During the shorter construction phase, annual company spends on procurement, infrastructure, and direct employment are at their highest levels. No government revenue is generated during this phase.³ Before and during the construction phase, several areas of public policy are important – training and skills development initiatives (to ensure that local employment is maximized), enterprise development and local content (to ensure that local procurement is feasible during the operations phase), and infrastructure planning (to ensure that complementary public investments are made to maximize the benefits of new roads and ports) all become important even before operations begin.

During the longer operations phase the spending allocation shifts. Annual spending on procurement, infrastructure, and direct employment drops but is sustained over long periods of time. Government revenue from taxes, royalties, and profit shares are only generated several years after operations commence. Oil and gas projects tend to generate revenue for government more quickly (in the space of a few years) while mining projects take a longer time to generate government revenue (sometimes up to a decade) once operations commence. This means that public spending decisions are most important a few years into the operations phase of projects but that planning for this spending should take place long before the revenues arrive.

³ Apart from the revenue generated from employees paying income tax.

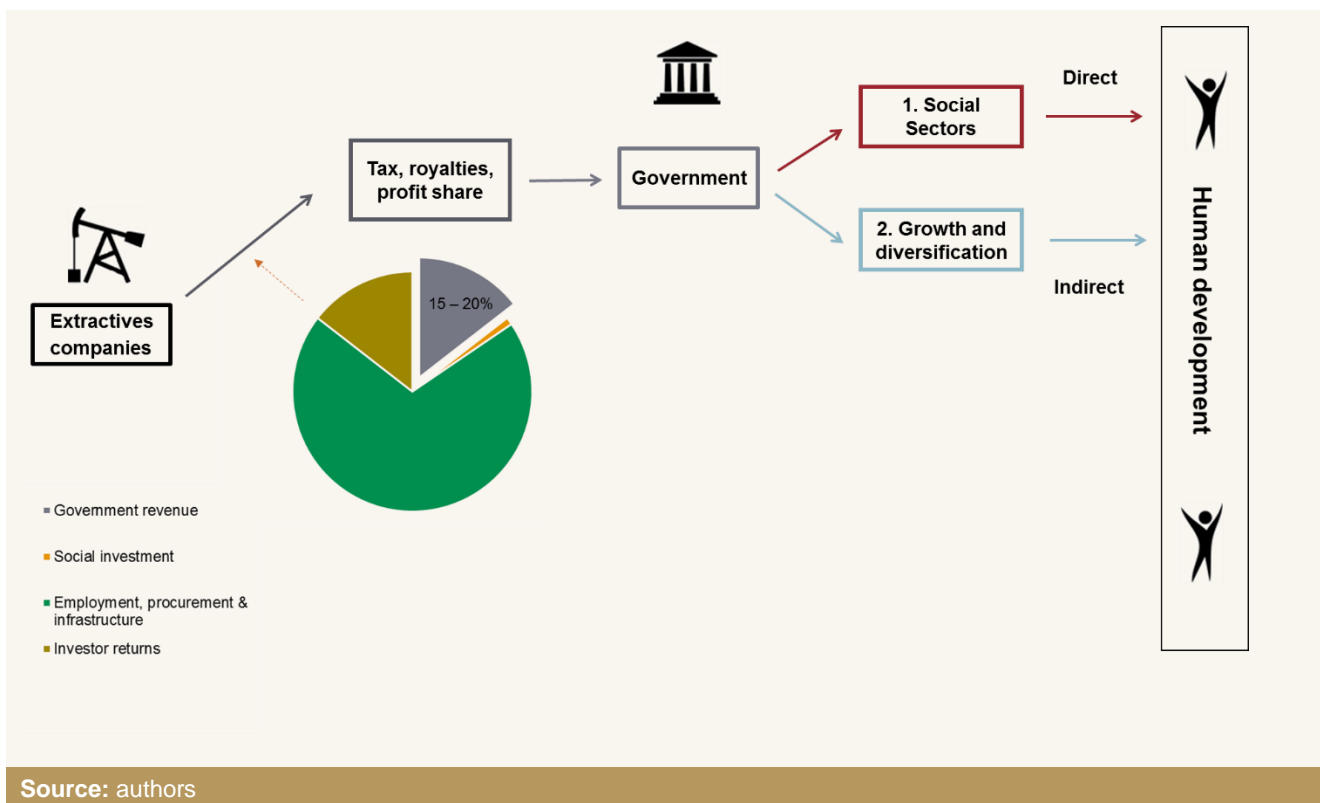
The allocation of social investment spending over time depends on individual company approaches to social investment and comments on the timing cannot be generalized.

2.3 Public spending and industry activity channels

2.3.1 Public spending channels

The public spending channels shown in Figure 3 are replicated in Figure 5. This spending results from revenue payments made by extractives companies to government. This revenue increases the overall resources available to government for public spending. As outlined earlier, the amount of overall project spend that is paid to government ranges from 15 to 20 per cent in mining projects and 30 to 40 per cent in the oil and gas sector. The additional resources made available to government are likely to be spread across a wide variety of sectors, including government administration. To influence human development, though, at least some of this spending needs to go toward areas that either directly or indirectly target human development.

Figure 5: Public spending channels: Social sectors and economic development



As outlined in Paper 3, it is important to note though that the major government revenues are typically only generated several years (in some cases up to a decade) after operations start, that when they arrive they are subject to large fluctuations, and that these resources are finite – when the extractive resource runs out, so do government revenues from the sector.

2.3.2 Social sectors (direct spending)

Public spending in health, education, and social protection can have a more direct, and potentially greater, impact on human development in the short term than the other channels. There are three main arguments for spending a proportion of government revenues on these areas. Firstly, many countries face gaps in financing for achieving their health and education goals outlined in their national development plans. Secondly, a better educated and healthier workforce tends to be more economically productive. Beyond the short-term boost to human development outcomes that can come from investments in health, education, or social protection, such spending can also be seen as contributing toward economic development. Thirdly, provision of adequate health, education, and social protection services helps to address poverty and vulnerability, reduce inequity and inequality, and build more cohesive and politically stable societies.

There is, however, no guarantee that spending on health, education, and social protection will necessarily translate into improved human development outcomes, as the characteristics of existing systems determine their capacity to absorb new funds productively. Spending money effectively will depend on identifying and rectifying systemic weaknesses, and having in place high-quality mechanisms to decide among competing options for specific projects – a subject explored further in Paper 4.

While the human development returns from this spending channel have the potential to be generated more quickly, they are also associated with large recurrent costs that need to be financed over the longer term. A large but potentially short-lived increase from the extractives sector will not be able to finance these recurrent costs over the long term when revenues generated by the sector dry up, so investments will also have to be made in growing the non-natural-resource sectors of the economy.

2.3.3 Growth and diversification (indirect spending)

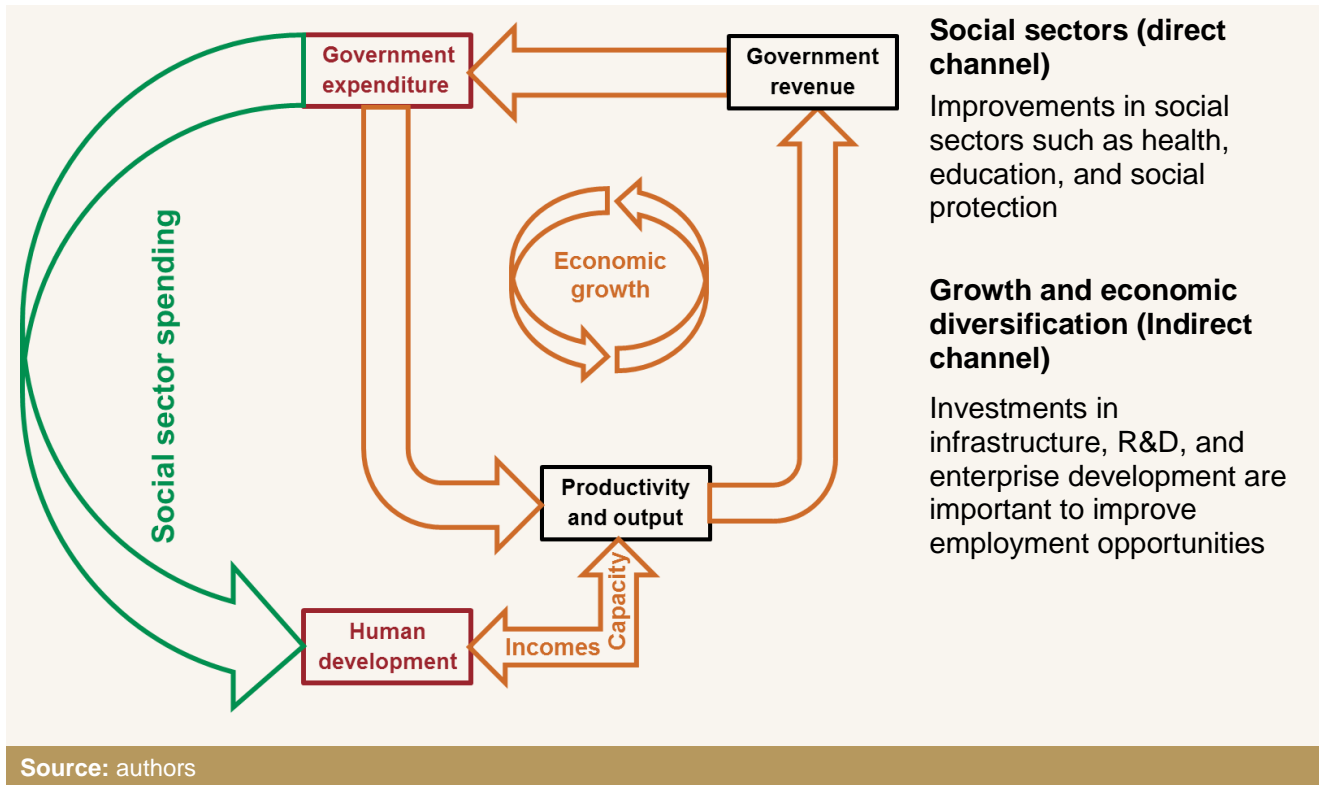
Public spending on growing the non-natural-resource sectors of the economy can also impact on human development more indirectly through the income dimension. For example, improved infrastructure can increase access to markets, which increases income for individuals. Other investments in areas that support economic growth or improve productivity include research and development (R&D) and enterprise development. However, given the finite nature of extractives resources, this avenue of spending also has an important role to play over the longer term. Investments that help develop and diversify the broader economy over the long term are important for ensuring that future government revenue can be generated from the non-extractives sectors of the economy when extractives resources run out. So beyond the current impacts on human development through income generation, indirect investments are important for generating future revenues to be used to finance recurrent expenditure and to make the later new investments in health and education.

2.3.4 Direct and indirect spending allocation decisions

Figure 6 below presents a stylized picture of how direct and indirect spending influence human development. Deciding how to allocate resources between these two avenues is no easy task. Decisions regarding how resources are allocated will be shaped by the relative importance given to

gains in human development now, versus in the future. In addition, the particular characteristics of the extractive resource itself can shape decisions regarding public expenditure.

Figure 6: Direct and indirect spending on human development



In cases where the new natural resource is likely to have only a limited life, the opportunity to achieve a human development transformation is itself a short-lived one – measured perhaps as two to three decades, or one generation. Governments may choose to use today’s resource revenues to invest in both direct spending on human development and indirect benefits for human development from the productive sector. This would also suggest that developing the non-natural-resource parts of the economy would be a priority aspect of a successful economic and human development strategy for the longer term.⁴

On the other hand, if revenue streams from the natural resources sector are certain to be available for the very long term (three or more generations) then the immediate decisions on how to spend will also vary and governments may be less inclined to build diversified productive activities to replace the economy’s dependence on extractive activities.

2.3.5 Industry activity channels

Industry activity channels (i.e. the activities undertaken by extractives companies themselves) have received less attention than the public spending channels but are also important for generating human development. These are divided into two main categories according to areas of project spend. The first relates to spending on areas of core commercial activity such as the employment of people, the procurement of goods and services, and the building of infrastructure for operations.

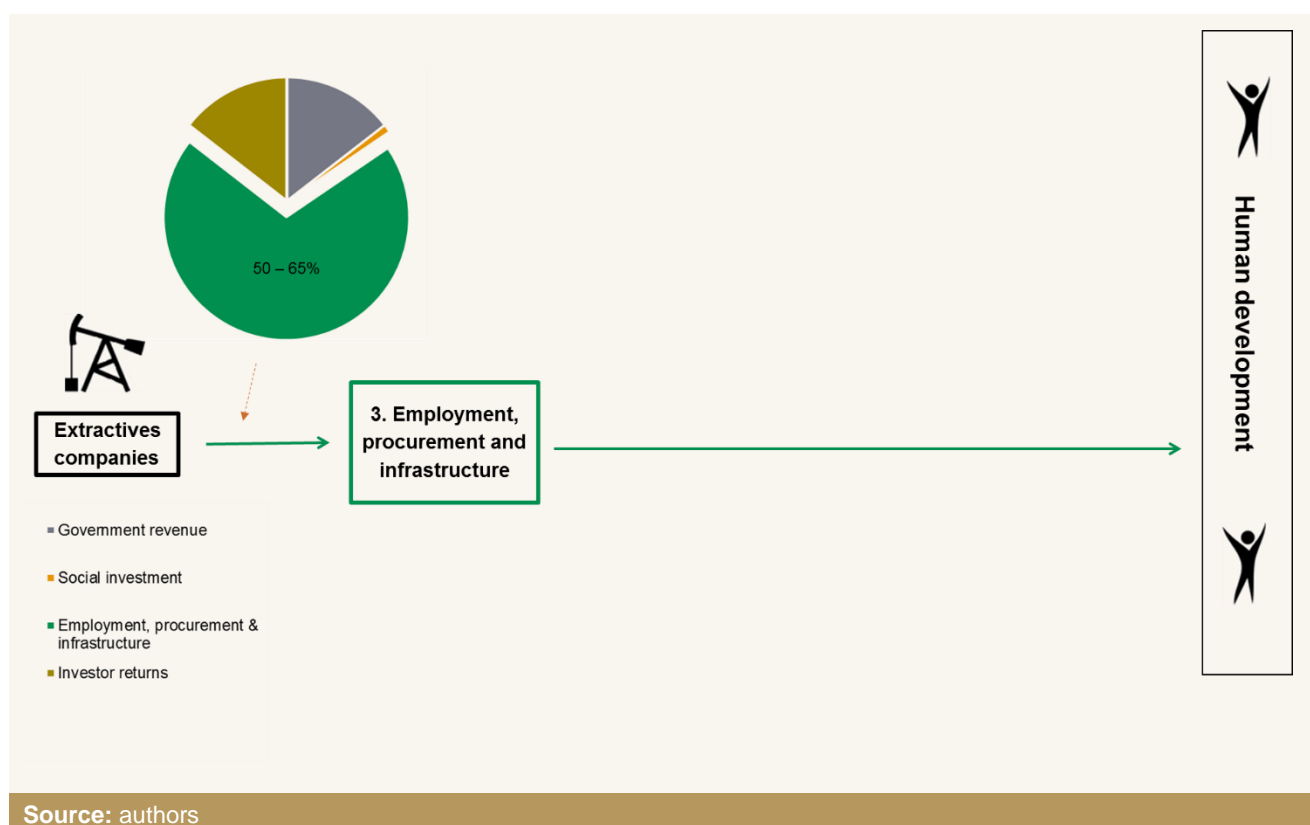
⁴ i.e. industrial and services sectors other than extractive industries.

The second relates to social investments that are made in surrounding communities. An important note to policy-makers is that extractive companies' activities intersect with government policy in important ways. Harnessing and enhancing their human development impact requires well thought-out public policies (see Section 2.4).

2.3.5.1 Employment, procurement, and infrastructure

Figure 7 shows the core commercial activities component of the industry activity channels, which includes spending on employment, procurement, and infrastructure (the color coding is as in Figure 3). As outlined earlier, the amount of overall project spend in this area is large, amounting to 50–60 per cent in mining projects and 40–50 per cent in oil and gas projects. However, human development impacts from this area of spend are not guaranteed as they depend on the level of local participation in employment and procurement, and on public access to newly built infrastructure – areas that public policy can influence.

Figure 7: Industry activity channels: Employment, procurement, and infrastructure



Employment

The additional employment generated by extractives projects has the most directly positive impact on human development for the individuals employed (through the income dimension) and also for their dependents. The human development impacts within a country depend, though, on how many of these new jobs are given to local people, which in turn depends on the skills available in-country. Companies often put in place their own training initiatives but government can play an

important role in ensuring that the skills needed for new extractives projects are available among the local population.

The amount of direct employment generated from extractives projects is limited due to the capital-intensive nature of the industry, but this differs by project phase. The number of *direct jobs* created is largest during the construction phase of projects. The construction phase is typically short term (two to four years for mining and four to five years for oil and gas). During this phase several thousand new jobs will be created (in a typical project) and a process of training and upgrading of local skills will also begin. If managed well, the new skills that are developed can play a significant longer-term role in the national economy (e.g. in house building) once the construction phase of the extractives project is finished. The operations phase is much longer, typically spanning several decades for both oil and gas and for mining. Direct employment during this phase is typically much smaller (ranging from several hundred to several thousand jobs) but the jobs created are more permanent, while longer-term training and skills development can also be expected to be one of the core activities of the extractives companies.

In addition to direct employment and skills the operations phase also has the potential to generate significant further *induced benefits* to the economy and to the human development of local populations. These induced effects arise mainly from the spending of the wages and salaries of local employees of both the extractives companies and their local supplying firms. Given that extractive activities may be concentrated in a limited geographical area, such additional spending has the potential to boost local economic activity by a considerable percentage.

Procurement

Another area of project spend with the potential to influence human development through the income dimension is that of the procurement of goods and services. Similar to employment, the impact from procurement on human development depends partly on how much local procurement takes place, which in turn depends on the skills and businesses available in-country. The pay-off from expanding the amount of local content in procurement can be large, amounting to tens of thousands of jobs (substantially more than the number of direct jobs created). However, local firms need to have the capacity to supply goods and services at international standards. Government intervention is often needed to accelerate the development of the firm capabilities that are needed to increase local content in supply chains.

Spending on local goods and services in the value-chain can be expected to stimulate the emergence and growth of a variety of local suppliers and the additional indirect jobs, skills, and technologies associated with those firms. Even in the early stages of a new extractives project and in economies with only limited industrial capacity (e.g. Tanzania and Uganda), a major part of *services* procurement (e.g. catering, legal services, cleaning) is likely to focus on local firms rather than on imports. By contrast, the enlarged capacity to supply manufactured *goods* to the new extractive companies will typically take some time to displace imports.

Infrastructure

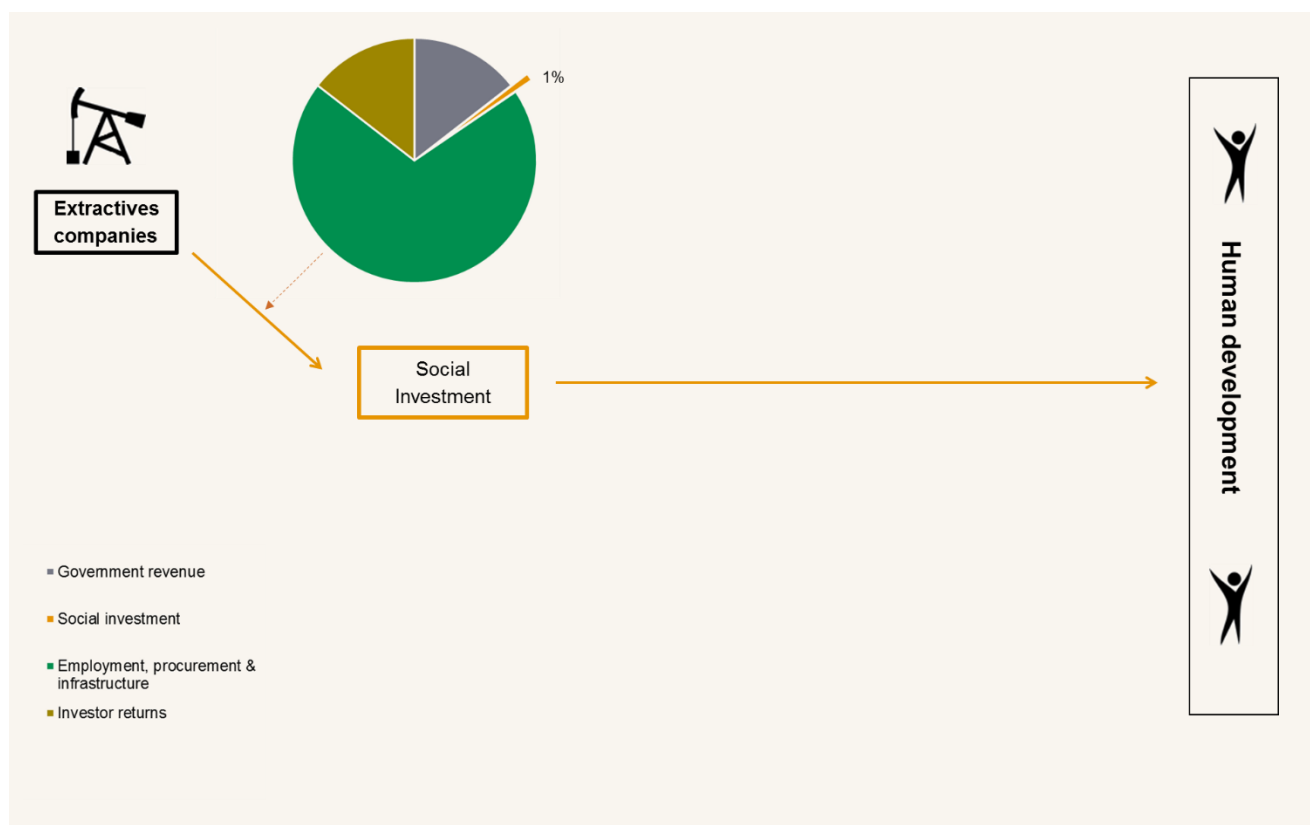
Companies require a basic level of infrastructure to operate. They need roads, railways, and ports to connect extracted resources to markets, electricity to power operations, and social infrastructure (schools, health clinics, etc.) for their employees. Yet they often operate in remote regions that are underdeveloped and have little existing infrastructure. Where this is the case, they themselves invest in the infrastructure that is needed. Where access to this infrastructure is available to the public, these investments can have a positive spill-over impact on human development in these areas.

While some regional benefits result automatically from infrastructure investments, most require complementary investments from the public sector to maximize benefits, particularly for those most in need. Government can take advantage of the basic infrastructure that the private sector funds and can invest in additional infrastructure or other complementary investments. These could include a range of things depending on the circumstances in the region – for example, rural roads, market facilities, local training facilities, or local power and water facilities.

2.3.5.2 Social investment

Figure 8 shows the social investment component of the industry activity channels. In both the mining and the oil and gas industries, this component typically accounts for around 1 per cent of total project spend. This amount is small as a proportion of total project spend but as it tends to be concentrated in quite small local areas, the spending in local communities can be significant.

Figure 8: Industry activity channels: Community spend



Source: authors

Most extractives companies make social investments in the local areas in which they operate. This is not part of their commercial activities. Instead they aim to make a positive contribution to communities living near to mines or near oil and gas operations. Arrangements for this differ by country (some countries specify mandatory investments while others do not) and by company (some companies standardize a particular level of spending while others vary spending according to local needs). The types of investments also vary and can cover a number of different areas. Typical investments include: the building of schools, hospitals, and health clinics; upgrading of roads; investing in malaria and HIV programs; support for alternative livelihoods; business development initiatives; and support for local government to cope with the influx of people into mining or oil and gas regions. Many of these investments make a contribution to human development in local areas through the health, education, and income dimensions.

Research suggests that social investments that are aligned with or carried out in partnership with government are more effective (ICMM, 2014). Government can take advantage of the additional resources that companies invest to complement their own investments in local areas.

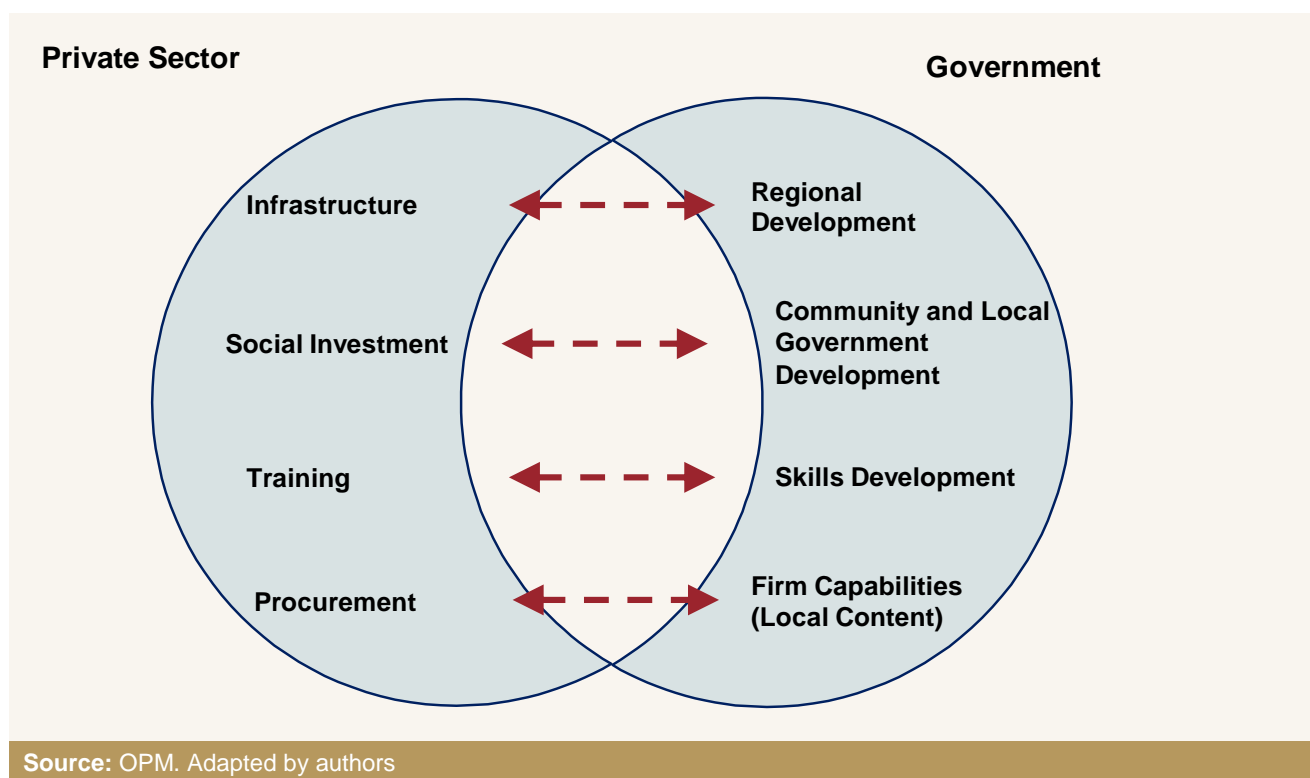
2.4 Linking the public spending and industry activity channels: A collaborative approach between the public and private sectors

Many of the debates about the contributions that the extractives sector can make to human development focus centrally on how the public revenues from the sector are spent. However, Figure 2 and the percentages shown in Figure 3 suggest that this is a much too narrow approach to take. In particular, such an approach ignores the potential for contributions from the private sector beyond the revenues directly generated for, and spent by, the government.

The non-governmental part of spending will in any case always be relatively large – irrespective of government policies. The additional point to be made here is that the effectiveness of that spending and above all the pay-off from corporate spending to human development outcomes can potentially be increased where the policies of government and the activities of the corporates are working together.

Figure 9 shows some of the main areas where government and corporate activities and also incentives can be expected to intersect at least in part.

Figure 9: The channels – areas of aligned incentives for the private sector and government



All of the areas listed on the left are those in which companies make investments and are routinely engaged as part of their standard commercial operations. For example, investments have to be made in infrastructure, social investments are made in local areas, investments are made in training and skills development for employees, and goods and services are procured.

Regardless of how they are done all the corporate activities on the left involve some intersection with various policy areas of direct concern to governments. For example, the extractives companies' local infrastructure investments are likely to be an important part of government's regional development activities, their social investments will certainly interact with the levels of development in local communities and the capacities of local government, and their own training programs will contribute to government objectives and actions in relation to skills development.

The key point for policy here is for governments and companies to look jointly for areas of common interest and concern. Companies should be expected to be aware of local policies in areas of relevance to them and be willing to adapt and extend their own expenditure activities to ensure that these are working in a complementary manner to any parallel activities of government. Government for its part ought to be open to the idea of adapting some of its own policies and practices so as to ensure a bigger pay-off from any related activities in which extractives companies choose to engage. New training initiatives are one obvious example: a narrowly focused corporate program to train in-house engineers might easily be expanded with support from government to train a larger number for employment in other non-extractives companies.

3 Policy lessons from existing natural resource-rich countries

This section provides case studies of policy choices that have been carried out by governments with natural resource wealth in the past. In some cases these have been successful and in others less so. The objective is to provide a summary of lessons learned that may be adapted by the sample countries depending on their strategy for improving human development.

As Section 2 suggested, human development improvements are likely to come about not only as a result of government expenditure but also as a result of the direct activities of extractive industry projects. However, these impacts will not occur on their own and close collaboration between government and the private sector is often key.

Based on the framework introduced in Section 2, we divide our case study analysis into two broad but interlinked areas:

- **Public spending channels:** Improvements to human development as a result of increased public spending made possible by government revenues from production in the extractive industries. These could include direct spending on core areas of human development as well as spending on policies that stimulate economic growth and diversification.
- **Industry activity channels:** Improvements to human development that result from the activities undertaken by extractives companies. These include areas related to core activities (employment, procurement, and infrastructure investments) and those related to social investment.

3.1 Public spending channels

Neither direct nor indirect support to human development alone can provide a government with the full answer about the most appropriate way to improve human development. There have, however, been examples where governments have placed a heavy focus on direct spending on social services – with mixed results.

3.1.1 Direct spending: Spending on social services

The examples of Zambia and Botswana are useful reference points. In the case of Zambia, as described in Box 1, a focus on social spending gradually led to loading more and more social obligations on the state-owned company ZCCM. A combination of volatile mineral prices and excessive spending led to the eventual financial collapse of ZCCM and serves as a stark cautionary tale against an over-dependence of social provision on natural resource wealth.

Botswana, on the other hand, used a more balanced approach to building up long-term human development outcomes through government cooperation with a private mining entity. In some respects this approach was successful, although progress needs to be seen against the limited diversification away from diamonds that has been achieved by that economy. Boxes 1 and 2 give some selected insights into the approaches taken in the two countries.

Box 1: Zambia: Unbalanced investment of natural resource wealth

Copper mining by private companies was already well established in Zambia at the time of its independence in 1964, and there were hopes that Zambia would be able to use the revenues from the high copper prices for industrialization and poverty reduction. Following independence, Zambia nationalized its mining sector in the early 1970s and this led to the creation of Zambia Consolidated Copper Mines (ZCCM), the state-owned mining company. ZCCM was tasked with running the sector and was also responsible for the provision of social services and public goods for mineworkers and their communities. ZCCM effectively operated as the local government in the Copperbelt Province.

However, the nationalization of the sector was unfortunately timed: copper prices entered a protracted slump in the 1970s and 1980s. Higher oil prices during the 1970s made imported equipment more expensive. The combination of higher costs and lower prices, together with the many social responsibilities that ZCCM had been tasked with, led to it making large losses. Lack of capital to invest in maintaining the mines led to falling production: during the period of nationalization production fell by over 60 per cent. The government needed to borrow heavily to compensate for the shortfalls in revenue, and by the late 1990s Zambia was one of the most heavily indebted countries in the world. ZCCM had fewer and fewer resources to provide public goods and services in the Copperbelt and the delivery of these services came under strain, highlighting the problems of linking government service delivery directly to a volatile sector.

The result was the gradual financial collapse of the company, leaving no option but to privatize it in the 1990s. This left a gap in local service delivery which has still not been adequately filled by local government many years later. Human development decreased from 1980 to 1990 (from a HDI score of 0.422 to 0.407). By 2000 it had increased again but had only reached the same levels of human development it had achieved in 1980.

Source: ICMM (2014)

Box 2: Botswana: A focus on human development

Botswana's investment philosophy since independence has been based on the principle that diamond revenues should be re-invested into human and economic capacity – including education, health, and infrastructure. Economic development was seen as vital to creating job opportunities, and the investment strategy has combined direct and indirect contributions to human development.

The bulk of diamond revenue since 1983 has been used for investments in human or physical assets. Approximately 42 per cent of the revenues have gone into education, 14 per cent on health (much of which might be regarded as recurrent spending), and the remaining 44 per cent on investments in physical or financial assets – the largest of which have been electricity and water (8 per cent), housing, urban and regional development (7 per cent), and roads (6 per cent). Government surpluses (a further 5 per cent of revenues) have also been accumulated as government balances at the central bank or as foreign reserves (World Bank, 2013).

Much of the success might be attributed to the stability of the world diamond market, and the degree to which the diamond revenues have been captured by government and used to the benefit of the population. Management of the diamond resource has been founded on the partnership between the government and De Beers, the company that made the initial prospecting investments, reinforced by further De Beers investments in public health and infrastructure in Botswana (Krawitz, 2010).

Botswana's score on the HDI has increased steadily from a low base in 1980, indicating its success in translating natural resource revenues into human development benefits and a degree of economic prosperity.

Source: CGD and Mogae (2006); Krawitz (2010); World Bank (2013)

While some government revenue should be channeled into direct spending on human development for immediate gains, the spending approach needs to take into account the nature of the sector. The volatility of prices can lead to large fluctuations in the amount of revenue government receives each year. Also, the finite nature of natural resources in some countries means that the revenues for direct spending may not be sustainable over the longer term. Both

factors imply that direct government spending on social service should not rely too heavily on the extractives sector.

3.1.2 Indirect spending

3.1.2.1 Investing in infrastructure

Improvement in infrastructure is a compelling spending area in African countries with large infrastructure deficits. Funding from natural resource revenues can improve the capacity to invest in infrastructure; however, there is no assurance that such investment will have a positive impact on the overall economy.

There are various pitfalls. Public procurement of infrastructure, i.e. construction projects, has frequently led to sharp increases in prices, created by bottlenecks (i.e. inelastic supply responses) or by poorly managed procurement procedures leading to corrupt practice. The speed with which construction can be expanded without severely driving up prices determines the pace at which public investment can be increased (Henstridge and Page, 2012). A similar vigilance is required to ensure that all investment projects are adequately supported by an ongoing provision for the supporting recurrent expenditures (e.g. teachers' salaries in any new schools).

Botswana is an example where a country used a feedback mechanism to improve the quality of public investments. The country implemented a high-quality project appraisal system, combined with systematic feedback used to monitor and sustain the quality of its public investment program (see Box 3). Even well-prepared project appraisals cannot reflect network and other externalities across the economy, particularly for major infrastructure investments. However, the failure to reflect broad network-type externalities is not a reason for not carrying out a sound investment appraisal; it simply means that such exercises have to be put into a broader strategic context. Feedback on outcomes is invariably helpful.

Box 3: Botswana: Successful project appraisal strategy

One of the major contributors to Botswana's success in translating diamond revenues into rapid economic growth (and ultimately human development, as outlined in Box 2) was a firm insistence on good-quality appraisal of each public investment project. The writing of sound appraisals, and the recognition and rejection of weak or inadequate appraisals, was a required capability for officials to advance their careers in the Ministry of Finance.

In addition, the public investment program in Botswana was careful to provide for the recurrent costs of maintenance of new public assets. There was a rule of thumb that 18 per cent of the capital cost needed to be budgeted to operate any asset—whether a school, medical facility, road, or bridge. When they went and checked later, planners found that the actual ratio was a bit higher and cut back the investment program as a result.

Source: Henstridge and Page (2012)

3.1.2.2 Investing in economic diversification and structural transformation

Policies to maximize the benefits from the sector are beneficial in the short to medium term. However, over-dependence on the extractives sector can be problematic and governments will typically seek to avoid this in one way or another. For most countries where the mineral or

hydrocarbon resource has a limited life, the economic growth and government expenditure needed to sustain human development advances over the long term must come in large measure from other parts of the economy. Therefore, diversification should be a longer-term goal for natural resource-rich countries.⁵

However, diversification is very difficult in practice. There are numerous examples of mineral-rich countries that adopt the rhetoric of diversification over many years but fail to achieve it. This tells us that the process of transforming the structure of an economy requires more than effective management of natural resource revenues: this was certainly present in Botswana but not in Zambia. There are, however, several counter examples of natural resource-rich countries that *have* managed to successfully diversify. Some of these countries have actively used their extractives sector as a catalyst for growth in non-natural-resource sectors. Malaysia, Indonesia, and Chile all used public policy and effective spending to diversify their economic base but did so in slightly different ways. These cases are illustrated in boxes 4 to 6.

The presence of natural resources commonly creates a risk of Dutch disease, which could undermine economic diversification. However, this is not inevitable – as is discussed in greater detail in Paper 3, Dutch disease can be effectively managed through appropriate monetary and fiscal policy. Once macroeconomic fundamentals are sound, the extractives sector has a neutral impact on diversification. For example, the presence of oil in Malaysia had no impact on that country's industrialization efforts (see Box 4). An extractives industry can even be used as a catalyst for diversification efforts – Indonesia managed to use petroleum revenue to stimulate agricultural development (see Box 5).

Box 4: Malaysia: Successful targeting of the manufacturing sector

Malaysia created a successful manufacturing sector by investing in technology and infrastructure within specific target sectors – so-called 'vertical' industrial policy. In the 1970s Malaysia promoted the export of cheap manufactured goods. Once basic capabilities were developed, policy in the 1980s shifted to skills upgrading combined with support to the manufacturing of higher technology products. Foreign investment and skilled immigration were encouraged, enrolment in polytechnics expanded, skills development programs were sponsored, and exchange programs with foreign universities were put in place.

In the 1990s industrial clusters (export process zones) – specific geographic areas for the establishment of manufacturing activities – were developed. Within these zones, customs procedures were simplified and economic and social infrastructure was put in place. This attracted a number of large high-tech producers and skilled workers. A strong manufacturing base in high-value products was established and local supplier firms grew as a result of the agglomeration of leading firms. Human development in Malaysia has improved significantly since 1980 (when it scored 0.577 on the HDI). With a score of 0.773 it is now classified as a country with 'high human development'.

Source: Page (2008)

There are two main approaches to actively encourage diversification. Overall production costs in an economy can be decreased by adopting various policies to help the non-natural-resource sectors in general ('horizontal industrial policy') or specific sectors can be targeted and supported

⁵ Diversification to avoid natural resource dependence is important for a number of reasons. More diversified economies perform better in the long run, experiencing higher growth than countries with concentrated economic activity (Gelb, 2010). Expansions in the non-natural-resource sector can generate employment (important for the livelihoods of individuals) and expand tax revenue for government (important for sustaining future spending in social sectors). Expansion also makes economies more robust and stable, insulating them from the boom and bust cycles of extractives sectors.

(‘vertical industrial policy’). Successful industrializers have generally adopted a combination of such approaches while simultaneously investing in building institutional and human capital – see for example Malaysia’s experience outlined in Box 4 of reducing the costs of production in the economy in general while also targeting manufacturing (and even particular sorts of manufacturing) as an area for growth. But additional avenues are also open to natural resource-rich countries and the focus does not necessarily have to be on the manufacturing sector alone. Indeed, in the new natural resource-rich economies of low-income Africa this may not be appropriate. Indonesia, for example, used some of the revenues from the oil sector to successfully invest in agriculture (see Box 5).

Box 5: Indonesia: Using petroleum revenues for agricultural development

Indonesia and Nigeria experienced oil booms at more or less the same time and were similar in their economic structure at that time. The paths they followed after their natural resource booms are instructive. Nigeria became increasingly dependent on the oil sector. By contrast, Indonesia was able to use the oil sector first to expand into the gas sector and then to increase agricultural output. Nigeria’s non-oil agricultural industries suffered badly because of Dutch disease problems.

In the 1970s and 1980s oil revenues in Indonesia were used to finance large investments in natural gas resources. Gas was exported and also used as an input to fertilizer production. Revenues from oil and gas were then used to subsidize the price of fertilizers and to make investments in infrastructure (schools, roads, irrigation, etc.) in rural areas. This boosted productivity and also generated numerous jobs in the agriculture sector. By 2008, Nigeria had reached similar HDI levels to those achieved by Indonesia in 1980. While HDI levels have improved in Nigeria over time, progress has been slow and Nigeria is still classified as a ‘low human development’ country while Indonesia is a ‘medium human development’ country.

Source: Page (2008); Gelb (2010)

Chile chose instead to move into knowledge-intensive natural resource-based exports by investing in knowledge and putting a public–private partnership in place to identify and coordinate dissemination of best practices (see Box 6).

Box 6: Chile: The move into knowledge-intensive natural resource-based exports

Chile successfully diversified into high-end agriculture and agro-industrial products, insulating government spending from fluctuations in the copper market through the use of stabilization funds. From a stable base, the government was able to focus on improving the business environment and improving the capabilities of firms in targeted industries. Chile reduced production costs for all producers by improving the general business climate. Today Chile remains the highest ranked Latin American country on the World Bank’s Ease of Doing Business ranking. However, efforts were also made to target particular industries. Fundacion Chile, a public–private partnership, was set up to support the acquisition and diffusion of production knowledge between firms. It led the effort to identify global best practice, encouraged technical development, shared information on standards, and coordinated small producers. Chile also successfully diversified into knowledge-intensive natural resource-based exports in salmon, horticulture, and wine. Chile has experienced sustained improvements in human development. Today Chile is classified as a country with ‘very high human development’ with a score of 0.822 on the HDI.

Source: Page (2008); Gelb (2010); UNDP (2011)

These various country examples together show that there is no single route to diversification. They also show that industrial policy and public spending can work well together when they are consistent with a country’s endowments of natural, human, physical, and institutional capital. Countries that have successfully diversified have also been successful at improving human development over time.

3.2 Industry activity channels

3.2.1 Employment, procurement, and infrastructure

The potential to leverage commercial activities to boost economic and human development is greater in the mining sector, where a proportionally greater amount tends to be spent on employment and procuring goods and services that could be supplied locally, than in oil and gas projects. In the latter, commercial spending tends to skew more toward the purchase of highly specialized machinery.

3.2.1.1 Employment: Training and skills development

The number of local people employed in extractives projects varies. This depends to a large extent on the skills available in-country. Countries with better education systems and a history of mining or oil and gas extraction have higher levels of local employment within the industry. As mentioned in Section 2.3.5.1, companies invest substantial resources in training for their direct employees. Moreover, governments can complement skills development initiatives undertaken by extractives companies to enhance skills more broadly. In particular, training in sector-specific skills undertaken at the national level (e.g. through technical and vocational education and training (TVET) systems) increases locally available skills. However, collective action and cooperation with industry is essential if the educational and skills investments made by government are to translate into increased employment opportunities for nationals both in the extractives sector and beyond. This is not easy to get right and many countries have struggled to match the skills produced in-country with those demanded. Box 7 outlines the case of Mozambique, which has attempted to address the skills gaps through reforming the TVET system. Companies indicate, however, that skills gaps still exist several years after the reform.

Box 7: Mozambique: Attempts to address skills gaps

Mozambique is endowed with a range of mineral deposits, including fuel and non-fuel minerals. The rapid economic growth in general, and in the mineral sectors in particular, has resulted in high demand for skills at higher education and TVET levels.

Training provision has thus far failed to meet demand. TVET represents a key area of skills shortages according to industry: mining company Rio Tinto estimates it will need around 700 skilled professionals and 9,300 semi-skilled and un-skilled workers (SDSG, 2012). However, the education system is skewed toward tertiary education: in 2010 there were 81,250 students enrolled in higher education, compared to 38,000 enrolled across all TVET institutions.

To enhance TVET provision the Ministers of Education, Labor and Higher Education and the *Confederação das Associações Económicas de Moçambique (CTA)* agreed in 2004 to incorporate TVET initiatives into an integrated TVET reform program. An Inter-Ministerial Commission for TVET Reform (CIREP) and a National Public–Private Commission for TVET Reform (COREP) were created through a government decree of 2005. These efforts are being supported by donors including the World Bank and GIZ, including through the establishment of a competency-based curriculum (in consultation with industry), the standardization of certificates between institutions, and a competitive fund to finance training initiatives managed by COREP. The impacts on human development of such initiatives are not yet known.

Source: OPM (2013)

3.2.1.2 Procurement: Local content

Extractive companies need to procure a large number of goods and services in order to operate. Expanding the amount of goods and services procured locally can have a dramatic impact on the lives of individuals in natural resource-rich countries, generating a large number of jobs and income. However, local firms need to have the capacity to supply goods and services at international standards. Government intervention – again supported by the mining or oil and gas companies – will normally be needed to help develop the firm capabilities that are needed to significantly increase local content in supply chains.

Approaches to increased local content can be government⁶ or industry⁷ initiated or carried out in various types of partnership. Government policies need to be sensitive to the fact that much of the supply chain requires highly specialized equipment that tends to be produced in only one or two locations in the world. Countries that have existing capacity in related industries can build on this to develop specialized skills (see Box 8, which outlines how Norway successfully developed local supply capacity). There are good examples (e.g. Nigeria and India) where one or more supplier firms have built global-standard capacity in a few specialist areas that can even export as well as supply domestic natural resources companies. But most countries will have to focus on building supplier capacity in non-specialist areas. Even in non-specialist areas, building supplier capacity takes time and typically requires partnerships with the natural resource industries and maybe others.⁸

Box 8: Backward linkages: Norway's development of local supply capacity

Norway developed local supply capacity through a series of targeted policies in the 1970s. At this time, Norway had some industrial capability in related industries (such as ship equipment and mining) but almost none in the oil and gas industry.

Foreign operators were encouraged to contribute toward domestic supplier capacity. As part of the licensing process, foreign operators had to establish plans outlining how they would develop local suppliers. These costs were subsidized by government through tax deductions. New contracts in future licensing rounds were awarded to companies that had successfully implemented these plans. They were also encouraged to form R&D partnerships with Norwegian research institutions. The government actively promoted centers of excellence in offshore technologies.

Norway has since developed state-of-the-art technologies and many international companies have chosen to move parts of their R&D activities permanently to Norway.

Source: Hatakenaka et al. (2006); Domjan (2004)

In countries without existing capacity in related industries, government and industry need to work together to increase local content. Legislation that forces a fixed percentage of local content on industry without understanding industry needs can have unintended consequences and actually reduce local content. Successful examples of improved supplier capacity and increased local content have been found where industry has initiated supplier development programs or where

⁶ Legislative approaches range from legislation with specified mandated requirements for local employment and procurement, to those that apply increasing requirements over time to those that simply express a general preference for local suppliers to those that require industry to submit their own plans for increasing local content. Mineral development agreements also display a similar range.

⁷ For example, the Anglo-Zimele initiative in South Africa.

⁸ The example of Vale in SE Para state is one where a variety of non-mineral firms also associated themselves with the mining companies in order to promote and build capacity in supplying firms of interest to some or all of them.

government and industry have worked together to develop supplier capacity (see Box 9 for the example of Chile).

Box 9: Partnerships between government and industry to develop supplier capacity in Chile

A joint program aimed at developing a mining cluster and improving supplier capacity in Chile's Region II (Antofagasta) was initiated by government regional representatives. Industry (through a regional industry association and individual companies) and national government regional representatives participated in the program. Industry and government both spent US\$ 15 million over a five-year period to fund a variety of initiatives. The most important initiative was assisting local companies to obtain International Organization for Standardization (ISO) 9000 and 14000 certification. The number of certified companies grew from eight in 2002 to 122 at the end of 2004. The cost of certification was shared between the government, mining companies and the participating enterprises. Certification made companies more competitive, particularly in export markets.

Source: ICMM (2007)

3.2.1.3 Infrastructure

Companies require infrastructure to carry out their commercial operations. Roads, railways, and ports are needed to connect to markets, power is needed for operations, and social infrastructure (schools, health clinics, etc.) is needed for employees. Where this infrastructure does not exist, companies will invest in developing it. These investments can have a positive impact on development, particularly in remote areas with little existing infrastructure. Although built for the use of the natural resources sector they can often provide shared use for local businesses and populations that would otherwise not have access to such facilities. For example, the investment that Tenke Fungurume Mining (TFM) made in road infrastructure in the DRC (see Box 10) helped link remote towns and villages to markets in cities in the rest of the country. The increased trade between regions made a positive contribution to the nutritional status of the population (from inward trade) and to local incomes (from outward trade), both of which have made a positive contribution to human development in the region.

Box 10: Improved livelihoods and nutrition from road investment in Katanga, DRC

TFM began operations at its mine in Katanga in 2009. The town (Fungurume) and surrounding villages survived off subsistence farming and artisanal mining at the time. Since then, Fungurume's population has tripled and the local economy has grown to include a large number of diverse commercial establishments, providing jobs to about 2,000 people.

Much of this development is due to induced employment but two actions by TFM were crucial. First, the company improved the road between Fungurume and Lubumbashi (the provincial capital), cutting the driving time from two days to four hours. Second, it built a new market. The improved road made it possible for traders from other parts of the province to reach Fungurume, increasing local supplies of consumer goods. It also provided local farmers with an outlet for their produce, allowing them to earn cash income (in contrast to the non-monetary economy that existed before the mine). As a result, local incomes and the nutritional status of the population have improved.

Source: International Labour Organization (2014)

While some regional benefits result automatically from the corporate infrastructure investments, most will require complementary investments from the public sector to maximize benefits, particularly for those most in need. Government can take advantage of the basic infrastructure that the private companies fund, and invest in additional infrastructure or other complementary investments. These could include a range of things depending on the circumstances in the region –

for example, rural roads, market facilities, skills development initiatives, or access to finance. The experience of Port Ehoala in Madagascar is instructive (see Box 11) – while some people were able to benefit from a newly constructed port, others were excluded due to a lack of skills and equipment. Complementary investments will be needed to ensure that those with the fewest resources are able to benefit.

These are good and positive examples of the complementarity between corporate infrastructure investments and the human development needs of local populations. Unfortunately it is quite rare for governments in natural resource-rich countries to recognize fully the potential of such arrangements and to commit enough time and political capital to encourage and develop them. The potential is also impeded in some cases by inappropriate arrangements for fiscal decentralization. Resource companies too are often slow to appreciate the wider benefits for their social license to operate by opening up their own commercial infrastructure for wider shared use by local populations. For the new natural resource-rich economies in Africa there are important lessons to be taken from these experiences.

Box 11: Port of Ehoala construction in Madagascar

Rio Tinto has been operating in south eastern Madagascar since the 1980s. At that time, only rudimentary infrastructure in the form of a basic but degraded road network and a run-down port facility existed. The company sponsored a regional development plan which was co-funded by the World Bank. A new road network and multi-user port facility were built (ownership of which will eventually be passed on to national government).

Apart from mineral exports from Rio Tinto's operations, the port now handles most of the region's major exports and is used as a dock for cruise ships. This has increased economic activity in the region – those in surrounding areas are able to benefit from access to international markets through modern ports facilities and income-generating activities from tourism. However, challenges remain. Although some have benefitted, others are restricted by a lack of skills, equipment, and enabling infrastructure, highlighting the importance of additional complementary infrastructure and skills investments by government.

Source: ICMM (2010)

3.2.2 Social investment: Community and local government development

While most extractives companies make social investments in the local areas in which they operate, research suggests that social investments that are aligned with or carried out in partnership with government are more effective (ICMM, 2014). Government can take advantage of the additional resources that companies invest to complement their own investments in local areas. Box 12 outlines an example of a successful malaria initiative carried out jointly by government and two of the mines operating in the Copperbelt in Zambia. This has contributed directly to human development in the Copperbelt through improved health in the region.

Box 12: Improved health through social investments in malaria initiatives in the Copperbelt in Zambia

The two oldest mines in the Copperbelt region that are now back in private ownership – Mopani and Konkola Copper Mines (KCM) – implemented successful malaria control programs that substantially reduced the incidence of malaria in areas surrounding the mines, with the prevalence of malaria in some of the main mining areas decreasing by 80 per cent over a ten-year period. As a result of this, the government used these programs as the basis for developing the National Malaria Control Program (NMCP). All mining companies now implement malaria initiatives as part of their social investments and ensure that they are aligned with the NMCP. Similar programs can be found in other countries, such as Ghana

Source: ICMM (2014)

The potential pitfall of such arrangements is that the often superior spending power of the mining companies can swamp what is possible from the normal delivery of similar services by local governments. In some cases, this can undermine the authority of the local governments and convert the mining companies into quasi-governmental agencies, a role that most private companies try hard to avoid. In the most extreme cases, as illustrated by Zambia in the period when mining was nationalized (see Box 1 above), the social spend from the company can in effect eliminate the need for most local government services in the mining region.

Social investments can also make a slightly more indirect contribution to development in local communities through capacity-building initiatives for local governments (which are ultimately responsible for development in local areas). Box 13 outlines a successful example of capacity building for local government in mining regions in Brazil.

Box 13: Local government capacity building by mining companies in Brazil

Vale is the dominant mining company in Southeast Pará in Brazil. Local municipalities in Brazil have significant responsibilities for delivering public services at the local level but are often faced with capacity constraints. The region is relatively new to mining and at the time when Vale began to invest the local administrations were extremely small and embryonic, with almost no capacity. Part of Vale's social investments includes significant technical assistance for capacity building in the municipalities themselves, e.g. in budgeting and the ability to prepare projects for federal funding programs. Through Vale's Public–Private Social Partnership initiative, municipalities have received technical assistance in mapping demand for public investments, applying for funding sources, and in the design and monitoring of projects.

Source: ICMM (2013)

4 Policy implications

Governments in countries with newly discovered natural resources have the opportunity to transform these resources into improved human development outcomes – using them as a catalyst to improve health, education, and living standards for their populations. This is not entirely straightforward. Policy-makers will need to be aware of the many areas of public policy that intersect with and influence the human development outcomes of extractives activities.

We outlined four main channels through which natural resource extraction can translate into improved human development outcomes. These include two public spending channels through which the government revenue generated by the sector can be used for public spending directly on human development through social sectors and indirectly through spending on economic development. Two industry activity channels also exist – industry activities can impact on human development outcomes through commercial activities (such as employment, procurement, and infrastructure spending) and through social investments. Both government and industry activity channels are vitally important.

Public spending of government revenue to directly and indirectly generate human development will be significant. However, revenues of the size projected for most of our sample countries (see Paper 3 for details on this) are not large enough to be transformative and cannot cover all funding gaps. Instead, they can be used for incremental improvements in health, education, and living standards, which will involve difficult policy choices. The revenues cannot sustain high incomes alone nor are they expected to be a permanent source of income. To make the most of the potential that new natural resources offer, well thought-out policies to enhance the positive impacts from industry activities are also needed. This means that serious consideration needs to be given to policy areas such as skills development, local content, infrastructure planning, regional development, local government capacity building, and economic diversification.

The timing of impacts through public spending and industry activity channels varies over the course of the life of an extractives project and this has implications for when particular policy areas gain prominence.

- The earliest of policy considerations relates to **training and skills development** to enhance the employment prospects of the local population during the short-term boost that occurs during the construction phase. This early skills development can be used as an opportunity to generate transferable skills to increase local employment, which can then be used in other areas of the economy after the project-related employment boom.⁹
- Capacity building and policy changes to enable **local content** in procured goods and services should start as early as possible as enterprise development can take many years. However, the level of urgency is lower as there is no one-off boost during construction as there is for employment.¹⁰
- Complementary public investments to the **infrastructure** investments made by companies (such as ports or roads) can be carried out during the construction and operations phases.

⁹ The issue of skills development is discussed further in Paper 7.

¹⁰ Local content is discussed further in Paper 6.

However, planning around shared-use infrastructure needs to take place before investments are made.

- **Public spending** only becomes possible at a later stage as the bulk of government revenue is generated years or decades after production starts. However, planning in advance for these expenditures is vital. These revenues can be used to finance a short-lived boost to human development and/or grow other areas to support human development in the longer term.¹¹
- In general, policies related to **social investment** do not have prominence at any particular time during the project lifecycle as companies' plans depend on the country and project context and approach.¹²

4.1 Lessons learned from the case studies

The case studies presented in Section 3 showed that countries have formulated policies and spending choices based on their unique situations, but results have differed sharply.

Government spending and investment of natural resource revenues on social sectors. The difficulty in obtaining information regarding the opportunity costs of spending decisions emphasizes the importance of due diligence in the allocation decision. The example of Botswana shows how a thorough and responsive approach to spending can improve the quality of outcomes. In particular, a robust project appraisal of the cost structure and the balance between investment and recurrent spending can ensure that the funding matches the spending profile.

Government spending on policies aimed at economic reform and diversification. The successful efforts of countries such as Chile, Indonesia, and Malaysia to transform natural resource riches into more broadly based economic growth were based on a wide strategic view. While the strategies adopted were diverse, and were adapted to each country's natural resource endowments and capabilities, they had a common element: each country focused coordinated actions on a small number of strategic objectives designed to diversify the economy.

Policies to enhance economic and human returns from industry activities. It is important to look beyond government revenues, as indirect impacts on human development from extractive industries are documented to be larger than direct ones (e.g. the creation of thousands of jobs in service supplier firms). In this respect, working with industry becomes important. Government needs to understand the industry to build on the opportunities that extractive industry investments and commercial activities generate. Government and industry have several complementary areas of interest.

This illustrates how broadly, but also carefully, governments in our sample countries need to consider their policy choices, including the balance between direct and indirect creation of human development. Decisions will depend on the priorities and objectives at the individual country level, and on the degree to which the preferences and aspirations of the population are accurately reflected in the national planning process.

¹¹ Public spending is considered further in papers 2, 4, and 5.

¹² Community spend is considered further in Paper 8.

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