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Background Note

Extractive Industries and Sustainable Job Creation

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17th Africa OilGasMine: Extractive Industries and Sustainable Job Creation

Background Note

1. Introduction

The year 2015 is a watershed for global development, with the international community adopting the 17 Sustainable Development Goals (SDGs) to end poverty, fight inequality and injustice, and tackle climate change by 2030. Particularly, Goal 8 and its targets have set job creation as an important global development priority, "to achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value by 2030".¹

Achieving Goal 8 in Africa will require the creation of millions of stable, wage-paying jobs. According to McKinsey (2012), if the positive trend in job creation witnessed during the last decade continues, then "Africa will create 54 million new, stable wage-paying jobs over the next ten years—but this will not be enough to absorb the 122 million expected new entrants into the labor force over the same period". The manufacturing sector is expected to create most of these jobs, but it is imperative to explore all avenues of job creation in the different sectors of the economy. The extractive industries can, and have to, make a fair contribution to this objective.

The African continent holds 8 per cent of world oil reserves and gas reserves.² The United States Geological Society (USGS) also ranks the continent first or second in its share of world reserves of a long list of metals and minerals.³ The extractive industries could bring many benefits to natural resource owners in developing countries. These potential benefits include significant revenues for host countries through production sharing arrangements, royalties and income taxes, as well as in field services. The development of the extractive industries could also generate wider economic benefits and promote inclusive growth and sustainable development through the creation of productive employment opportunities. However, even though the extractive industries that have grown from these abundant resources in Africa contribute significantly to government revenues, export earnings and economic growth, they employ less than 1 per cent of Africa's workforce in 2010 (McKinsey 2012).

This background note aims to set the scene for UNCTAD's 17th OilGasMine Conference, *The Extractive Industries and Sustainable Job Creation*, by taking stock of the daunting challenge faced by resource-rich developing countries: how to develop their resources in a way that maximizes value addition and job creation

¹ <https://sustainabledevelopment.un.org/>

² <http://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy.html>

³ These metals and minerals include bauxite, chromite, cobalt, ilmenite, industrial diamond, manganese, phosphate rock, platinum-group metals, rutile, soda ash, vermiculite, and zirconium (USGS 2014).

The rest of the note is structured as follows. In section 2, we attempt to conceptualize sustainable job creation through a review of definitions for jobs. In section 3 we examine the three channels through which jobs can be created in the extractive industries - the direct, indirect and induced channels. Section 4 examines factors and policies contributing to sustainable job creation, and Section 5 concludes.

2. Concept: Sustainable job creation

There are no universal definitions on jobs, job creation, or sustainable job creation.

The World Bank (2012) defines jobs as "all activities that generate actual or imputed income, monetary or in kind including salaried activities". The ILO and its constituents (i.e. representatives of governments, employers, and workers) pioneered the concept of *decent work* to promote work as "a source of personal dignity, family stability, peace in the community, democracies that deliver for people, and economic growth that expands opportunities for productive jobs and enterprise development".⁴ According to the ILO, the overall goal of decent work is to effect positive changes in people's lives through job creation and employment.

During the Millennium Development Goals (MDGs) era, a significant amount of evidence found that jobs were the most important determinant of living standards around the world, and that earnings from employment are the most important driver of poverty reduction (World Bank 2012). Job creation boosts living standards, raises productivity, and fosters social cohesion. In our view, going forward, jobs will remain a crucial channel of eradicating poverty and raising living standards in the SDGs era.

What has changed is that policymakers nowadays have a better understanding of the relationship between jobs, growth and development. For example, while the quantity of jobs that are created is still an overwhelming priority for many governments, the quality of jobs is also widely regarded as an important factor. The world wants more jobs, better-paid jobs with rights, decency and safety. In addition, it is important to look at how jobs are created, what types of jobs are created, which could have a big impact on inclusive growth and sustainable development.

The discussion we would like to inspire at our conference goes beyond sustainable jobs.⁵ In this context, "sustainable job creation" refers to the process of generating jobs that contribute to sustainable development goals. In other words, we conceptualize "sustainable job creation" as the job creation *process* that promotes economic growth, social inclusion and environmental protection.

⁴ <http://www.ilo.org/global/about-the-ilo/decent-work-agenda/lang--en/>

⁵ Sustainable jobs, opposite of temporary jobs, often refer to those jobs that are long term in nature.

Skill profiles of jobs in the extractive industries range from low to highly specialized. Additional jobs could also be created through linkages with other sectors of the economy. However, tackling sustainable job creation in the extractive industries is more complicated than counting the new jobs created by the industry. As new jobs are created in the extractive industries, others are destroyed. Although some jobs created in the extractive sector provide poverty-reduction opportunities, the absence of a well-developed institutional framework can mean that the environmental and social costs of extraction may outweigh its economic benefits (UNCTAD 2007).

For example, activities that take place during exploration, development and production of oil, gas or minerals could have negative impacts on the environment, such as destruction of community lands, degradation of rivers and ecosystems, contamination of water systems, destruction of rainforests, removal of topsoil to make way for vast open pit mines, and acid rain (Sibaud 2012). In addition, communities close to extractive sites can be exposed to acute and chronic health risks as they are exposed to chemicals and particles.

Artisanal and small-scale mining⁶ (ASM), as a labour intensive mining process widely conducted on an informal basis, is known to generate more direct and indirect jobs than large-scale mining. The potential of job creation by artisanal miners is big. It is estimated that there are at least 25 million artisanal miners worldwide, with 150 to 170 million people indirectly reliant on ASM for their livelihood, a number that is expected to grow to 200 million by 2020. In Africa, ASM creates about 8 million direct jobs which support over 45 million dependents.⁷

However, the poor management of ASM, the absence of closure procedures or land reclamation, and improper use of chemicals also contributes to environmental degradations, such as deforestation, river and dam siltation, mercury pollution and land degradation, which could outweigh or reverse the economic benefits of mining. A lasting environmental degradation caused by ASM can adversely affect not only the safety and health of miners at their workplaces, but also the entire mining community, including the life and well-being of miners and their families.

Environmental and health concerns about the extractive activities are challenges but also present some opportunities. These concerns could stimulate green jobs created in technical fields such as environmental engineering and risk management. The creation of these green jobs is vital for the sustainability of extractive industries as well as for the benefit of the broader economy.

⁶ Informal mining activities carried out using low technology or with minimal machinery - See more at: <http://www.miningfacts.org/communities/what-is-artisanal-and-small-scale-mining/#sthash.vAPfFzUg.dpuf>

⁷ http://www.africaminingvision.org/amv_resources/ISGbulletin4.pdf

In addition to the environmental dimension, "sustainable job creation" in the extractive industries also has a social dimension. The jobs created in the extractive industries do not always contribute to reducing income and gender inequality or promoting social inclusion. According to Efitime, Heller and Strongman (2009), the disparity in opportunities for men and women and youth in the extractive industries appears to be growing; the job opportunities created in the extractive industries and the associated earning potential are likely to be more available to men while women and their families are vulnerable to the risks created by such industries.

Actually, women entrepreneurs have great potential as job creators. The Global Entrepreneurship Monitor estimated that 126 million women were either starting or running new businesses, and another 98 million running established businesses in 2012 (Kelly and others 2013).

Unfortunately, women entrepreneurs' participation in the extractive industries meets obstacles and is often influenced by negative perceptions, attitudes, and discrimination related to gender stereotypes. In some countries, these stereotypes stray into downright superstition. For example, some communities believe that having women present at mine sites has a negative impact on productivity, by causing explosions in the mine or driving veins of ore deeper into the earth (Efitime, Heller and Strongman 2009). Women also face more tangible obstacles in buying land, opening bank accounts or obtaining loans. In some cases where they have been able to receive loans, they are subject to unfavorable terms, including high interest rates and short repayment periods (Kelly and others 2013). All of these obstacles result in fewer women working in the extractive industries, running their own companies or scaling up their business to create jobs (Michelitsch 2014). In Zambia, 40 per cent of women are engaged in entrepreneurial activities (Kelly and others 2013), yet estimates show that only one per cent of approximately 763 large-scale mining licenses are held by women.⁸

In contrast, women in developing countries, tend to be overrepresented in the informal sector and in self-employment where jobs are lower-paying and less secure (United Nations 2007). If the jobs created in extractive industries are not inclusive, it could result in risks to social stability, inclusive growth and even conflicts. Sustainable job creation, in our view, could contribute to meeting social goals such as creating more equal opportunities for women and youth.

3. Channels of job creation in the extractive industries

There are three main channels through which jobs are created in the extractive industries – direct, indirect and induced. In the literature, for each channel the economic dimension of job creation process has been adequately discussed while the environment and social dimension are often omitted in the analysis, a gap which we hope our conference could contribute to fill.

⁸ <http://www.yourcommonwealth.org/economic-development/economy-trade/women-entrepreneurs-in-zambias-mining/#sthash.rrUUdxPy.dpuf>

The direct channel refers to jobs directly related to the activities in the value chain of the extractive industries. At the beginning of the life cycle of oil, gas, or mine fields, i.e. exploration and appraisal phase, few jobs are created due to the nature of work conducted. The exploration phase is characterized by high levels of technology used for detailed geological and geophysical surveys and in evaluating the data to determine promising areas to mine or drill.

Most of the direct jobs created in the extractive industries take place at the development or construction phase (Table 1), where local workers may find jobs in various activities which involve labor-intensive construction methods.⁹ But this momentum for job creation fades when extraction begins, due to the capital intensive nature of the process. Other direct employment opportunities include specialist vocations such as geologists, petroleum or mining engineers, metallurgists, quarry and mine workers, heavy truck or tanker drivers. A number of studies suggest that extractive industries generate little direct employment, particularly after the fields and mines begin operations (World Bank 2012, Wise and Shtylla 2007).

In addition to the direct channel, extractive industries generate economic activity that can create interconnected linkages with the broader economy. These linkages occur in the form of backward production linkages (i.e. connecting the industry with the suppliers of inputs), forward linkages (i.e. connecting the processing of commodities into added value products) or consumption linkages (i.e. creating demand for locally produced goods as a result of incomes earned from employment in extractive industries). There are also horizontal linkages that can be gained (i.e. creating new industries using skills and capabilities acquired in the extractive sector).

The linkages created by extractive industries with the broader economy provide an important channel for generating additional jobs across different sectors of the economy through the indirect channel and the induced channel.

The indirect channel refers to jobs created by distributors and suppliers within the value chain. These are mostly jobs generated through the procurement of goods and services at every stage of the exploration, development, production and value addition of extractive commodities. They include services provided in connection with the transportation and distribution of goods needed in the extractive industries or those destined to the end user. Indirect job creation will reflect the extent of the local content and the degree of local SMEs are integrated into the value chains of extractive industries.

⁹ Such methods include construction of terminal utilities to support the running of the mine/oil and gas field such as power generation, waste treatment plants, potable water and water for firefighting and drainage; construction of roads, clearing of property sites; excavating for foundations; building and setting foundation forms; mixing, pouring, and finishing concrete foundations for buildings and plant equipment on foundations; fabricating and installing piping; installing electrical equipment, insulation, and instruments; erecting buildings; installing storage tanks; and dismantling equipment and reinstalling elsewhere, and rehabilitating infrastructure.

Table 1: Direct employment during construction phase of extractive industries

<i>Country</i>	<i>Project (sector or resource)</i>	<i>Investment, % of 2010 GDP</i>	<i>Direct employment number (during construction, unless noted otherwise)</i>
Papua New Guinea	LNG Project (natural gas)	237.0	9300 during construction; 1000 afterward*
Mongolia	Oyu Tolgoi (copper, gold)	742	14800 during construction; 3000-4000 afterward
Botswana	Jwareng Out 8 Project (diamonds)	20.2	1000
Papua New Guinea	Ramu Mine (nickel)	19.0	5000 during construction; 2000 afterward
Mozambique	Benga Mining (coal)	13.6	Currently 150; 4500 afterward
Tanzania	Mchuchuma (coal)	12.2	5000
Namibia	Husab Mine (uranium)	11.9	5200 during construction; 1200 afterward
Zambia	Lumwana Mine (copper)	9.3	4700 during construction
Pakistan	Reko Diq Mining (copper, gold)	4.0	2500 during construction; 200 afterward
Peru	Conga Mine (gold)	2.6	6000 during construction; 1700 afterward

Source: World Bank 2012, p.200, table 6.1.

*Note: *This figure indicates the number of direct jobs created in the longer term. Compared to the number of direct jobs created during construction, the figure is very small which indicates that most of the direct jobs created during the construction phase disappear once construction is finished and the mines and fields enter operation.*

The induced channel refers to jobs created by the consumer spending of income earned either directly or indirectly from extractive industries. The earned income from direct and indirect channels could be spent on goods and services (e.g. consumer goods, education, and health services) which create business opportunities, additional employment, earnings and spending multiplied throughout the economy. The magnitude of the induced effect depends on earnings from direct and indirect employment. Higher earnings tend to generate more spending and hence more induced employment (Bacon and Kojima 2011).

Extractive job multipliers describe the total number of jobs in an economy created per one direct job created in the extractive industries.¹⁰ If the multipliers are small, it implies that extractive industries have few linkages to the local economy; if the multipliers are large, it implies that extractive industries have strong linkages to the local economy.

The number of indirect and induced jobs created in the extractive industries can be significant. An International Finance Corporation (IFC) study on Peru’s Yanacocha mine finds that, between 2005 and 2006, the mine generated over 10,000 direct jobs and additional 90,000 indirect and induced jobs. The new jobs generated represented 0.4 per cent of Peru’s total formal employment, almost 19 per cent of formal employment in the mining sector, and 13 per cent of formal employment in the Cajamarca region.¹¹ In a review of global multiplier calculations done by IFC (2013), the creation of one direct job in the Ghanaian mining sector was found to generate 28 jobs - the total number of direct, indirect and induced jobs - in the economy (Table 2). This is an example of an extractive sector with strong linkages within the national economy.

Table 2: Job multiplier in the extractive industries

<i>Country</i>	<i>Mining</i>	<i>Oil & Gas</i>
Scotland	2.5	7.5
US	5.0	13.4
Chile	7.0	
Ghana	28	

Source: Adapted from IFC (2013), p.29, Table 3.1.

4. Policy implications

The potential of the extractive industries to create jobs is often not deeply explored in developing countries. Even though it is a challenging task, policy makers do have a repository of policy tools to incentivize sustainable job creation. We summarize these policies into three categories.

The first category includes those prudent macroeconomic policies, such as fiscal, monetary and exchange rate policies, that help maintain macroeconomic stability, promote steady economic

¹⁰ Several factors could influence the size of the employment multiplier, including the level of advancement of the economy (wealthier countries tend to have lower multipliers), the capital intensity of the sector (capital intensive sectors tend to have larger multipliers), and the extent to which firms outsource operations (those that outsource more will have large multipliers). Employment multipliers can vary dramatically. In practice, multipliers are difficult to estimate and dependent upon the quality of the data used to construct them. Where available information is unreliable, calculated employment multipliers will be questionable. Moreover, multipliers are often calculated based on liner models assuming past relationships between variables will hold true in the future.

¹¹ <http://www.ifc.org/wps/wcm/connect/3853268048f9cc368651ee28c8cbc78b/Yanacocha-Peru.pdf?MOD=AJPERES>

growth, and attract foreign and domestic investment, all of which are necessary conditions for sustainable job creation.

The second category of tools are local content policies which aim to stimulate broad-based economic development and help economic gains from the extractive industries trickle down to local businesses and communities.

The third category, going beyond the extractive sectoral policies, includes policies to foster diversification and structural transformation. Without diversification and structural transformation, resource rich developing countries will achieve neither sustainable growth nor sustainable job creation.

In this section, we focus our review of the literature and country case studies on the category of local content policies. It has been increasingly recognized that a transparent policy framework, including conditions for the participation of local businesses and workers in a resource project, can stimulate sustainable job creation. It is important to distinguish this from “domestic content,” which refers to requirements to use local inputs in the production of a good: domestic content requirements are prohibited under the WTO Trade Related Investment Measures (TRIMs) Agreement.¹² By contrast, local content policies require investors to buy goods and services from local suppliers and employ local workers in their projects. In terms of employment, these policies can provide for the recruitment, training, career progression of local workforce. Local content provisions have become widely accepted among transnational corporations (TNCs) – within their understanding of corporate social responsibility (CSR) or the so-called “license to operate,” for example – meaning developing country governments can directly negotiate with TNCs on the inclusion of such provisions in investment contracts. Furthermore, developing countries should enable domestic businesses to respond to local content provisions in investment agreements by making available to them fiscal incentives and subsidized financing.¹³

As an example of local content policies fostering the development of local businesses and boosting local job creation, the Brazilian government took advantage of huge oil and gas discoveries made in the 1990s to introduce minimum requirements for the use of local goods and services by extractive projects. Brazilian suppliers were hired whenever their bids include price, quality and other terms that were competitive with foreign bids, thus increasing the domestic industry's share in oil and natural gas exploration and development projects on a competitive basis.¹⁴

¹² https://www.wto.org/english/docs_e/legal_e/18-trims.pdf

¹³ Fiscal incentives and subsidized financing should be mainly for start-ups, and should be gradually phased out.

¹⁴ http://www.prominp.com.br/prominp/en_us/content/local-content-1.htm

Botswana's De Beers beneficiation strategy was another example. The strategy was designed to ensure a portion of diamonds mined stay in the country longer, so that value can be added through local business activities related to the diamond industry in sorting, valuing, cutting, polishing and retailing. The programme has generated thousands of skilled jobs in Botswana, Namibia and South Africa through the establishment of joint venture operations. By 2007, Botswana had created 3,200 manufacturing jobs as a result of this strategy, and businesses have adopted the latest diamond-related technologies (Grynberg 2013). The beneficiation policy has also generated additional jobs in other business sectors such as banking, security and information technology.

But local content policies are not always successful. In fact, they have had mixed outcomes, often because conditions on the ground preclude their effective implementation. These conditions include, for example, a lack of basic infrastructure, a scarcity of workers with the skills needed by the industry, barriers for local firms to start business, and limited access to credit. Therefore, local content policies shall be accompanied by a list of support programmes, such as investment in basic infrastructure, access to credit, education and capacity training, and a business friendly environment, to provide necessary elements for achieving local content goals.

Business environment: The private sector, in particular small and medium enterprises (SMEs), is central in sustainable job creation in extractive industries. Governments must create a business environment in which the private sector can grow and thrive. For example, governments could encourage the development of a solid financial system which offers financial products and services meeting SMEs' needs, and encourage the banking sector to increase lending to businesses associated with the risky activities in the extractive industries.

Governments can also help job creation by reducing red tape involved in registering new businesses. According to IFC (2013), making entry easier for firms in Mexico could potentially add three percent to annual job growth, and when it is combined with other regulatory reforms, the impact could be even greater.

Countries in resource rich developing countries can also orient their investment policies to attract FDI into extractive industries to promote growth and development through infrastructure development and job creation. For example, in the 1990s, the government of Peru passed several legislative measures to reduce obstacles to foreign capital flows towards the mining industry. Between 1996 and 2009, annual mining investments increased from US\$ 387 million to US\$ 2,771 million, and in 2009 more than 2.5 million people were directly or indirectly dependent on mining (Ticci and Escobal 2015).

Resource-rich developing countries should also emphasize technology transfer in their investment agreements. In general, this requires a corresponding commitment on their part to

minimum standards of enforcement for intellectual property rights, according to the relevant WTO Agreements.¹⁵

Investments in basic infrastructure: Extractive industries often require substantial infrastructure development to access remote areas, support extraction and transport products to market. Investing in infrastructure¹⁶ is known to have a high potential to create jobs and boost employment. For example a US\$1 billion spent on road construction in the United States is estimated to generate about 6,000 direct jobs, 7,790 indirect jobs and 14,000 induced jobs.¹⁷ But more importantly, providing access to infrastructure services can add significantly to job growth by allowing businesses and households to increase their output and productivity, and lower barriers to entry for start-ups.

Unstable supply of electricity is another infrastructure bottleneck faced by extractive industries in the developing world. The power deficits, according to a World Bank enterprise survey of more than 45,000 companies in 106 countries on perceptions of business environment based on experiences, is considered by more than one fifth of these companies surveyed as the biggest obstacle to their operations; annual job growth in low-income countries could increase by 4 to 5 percent if enterprises have access to a reliable supply of electricity (IFC 2013).

Access to credit: Access to credit is a major challenge confronting businesses in low-income countries (LICs), in particular to SMEs. In least developed countries (LDCs), 41 per cent of SMEs cite a lack of access to credit as a major constraint to their growth and development, as compared to 30 per cent of SMEs in middle-income countries (MICs) and only 15 per cent of them in high-income countries (HICs).¹⁸ In Africa, 32 per cent of African businesses cite access to credit as a major constraint on their growth (McKinsey 2012).

In the extractive industries, most activities in the value chain are capital-intensive and profitability is based on economies of scale (Tordo and others 2013). Despite their potential as important job creators, SME participation in the extractive industries is restricted by challenges in securing capital loans and, in some cases, working capital lines of credit as well. The particular challenge facing SMEs is that the depth of the bank credit market is much shallower

¹⁵ Several WTO Agreements include technology transfer clauses, including the Agreement on the Application of Sanitary and Phytosanitary Measures and the Agreement on Technical Barriers to Trade. But the issue is covered most comprehensively in the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS). Through its various Articles, TRIPS “promotes technology transfer as part of the bargain in which [developing countries] have agreed to protect intellectual property rights” and “requires developed countries’ governments to provide incentives for their companies to transfer technology to least-developed countries.” Source: WTO. “TRIPS Issues: Technology Transfer.” Available at: <https://www.wto.org> [Accessed 17 November 2015].

¹⁶ Basic infrastructure include transport links, new roads and upgrades, rail, airstrip, power supply, telecommunication, pipelines, water supply, waste water treatment, and others.

¹⁷ The direct impacts of infrastructure development on job creation may differ among countries based on their level of development as the construction techniques employed differ.

¹⁸ <http://www.worldbank.org/en/results/2013/04/05/msme-finance-expanding-opportunities-and-creating-jobs>

than in developed economies. The few banks that are able to offer financing often demand high collateral requirements, high interest rates and tight that makes it almost impossible for SMEs to apply for loans.

Similarly the potential for job creation by ASM is not fully achieved because of obstacles including, inter alia, limited access to credit. The shortfall in working capital precludes miners' ability to undertake exploration activities, and often forces miners to adopt less efficient, labour-intensive production methods. ASM also become more reliant on credit offered by middlemen and on quick sales to sustain their cash flow.¹⁹

The positive impact of facilitating access to credit on job creation is evident in Brazil's extractive industries where the state owned entity Brazil Development Bank, BNDES, provided subsidized, below-market interest rates on long-term loans to job creators such as large firms operating in the oil and gas industry as well as to new oil and gas service companies. According to BNDES (2005), the firms supported by the programmes have shown a higher growth of formal job creation, 20-30 per cent more job growth, than those firms with similar profiles but not supported by the programmes; the effect was larger for small firms.

Training and capacity building: The level of expertise required in the extractive industries varies in technical complexity and experience, from ordinary laborers to skilled professionals at different stages of the value chain. An economy that is short of skilled workers or with very limited technical capabilities will struggle to fill job openings, supply services to the industry and create linkages with the broader economy.

This could be due to lack of educational, vocational facilities or simply a mismatch between the training programmes that are offered by educational institutions and the skills needed in the industry. Attempts therefore arise to bridge the skills gap which has led to the establishment of specialized training centers. Partnerships with international companies have proven to be another crucial factor in the success of developing skills, training and building a competitive local industry.

For example, in 2003, the Brazilian national oil company Petrobras, in partnership with the federal government and educational institutions, launched a national mobilization programme Prominp to ensure the oil and gas industry is well supplied with the skills it needs over the long term. As part of the programme, 25 sectors were mapped to see where training was most needed and courses were designed to train the 185 categories of professionals that sector required.²⁰ Since its launch, Prominp has created 80 educational institutions in 17 states that trained over 78,000 workers in 2011, and overall, it contributed to the creation of 875,000 new jobs (Kayizzi-

¹⁹ http://www.africaminingvision.org/amv_resources/ISGbulletin4.pdf

²⁰ <http://www.progressivege.com/news-and-features/news-articles/can-brazil-fulfil-its-potential>

Mugerwa and Anyanwu 2015). In addition, the national agency of petroleum ANP also conducts human capital development programmes, funded by royalties and from a clause in contracts that requires companies to invest in research, development and innovation programmes.

Another example of improving capacity and competitiveness in the oil industry is provided by an international NGO, CDC Development Solutions (CDS) in Angola on linking global supply chains and local enterprise development. In 2005, CDS formed a partnership among the national oil company Sonangol, and international oil companies (IOCs) BP, Chevron, Total and Exxon Mobil to establish an enterprise development center called the Centro de Apoio Empresarial (CAE). The IOCs provided the investment capital for the centre, as well as jobs for the eventual graduates. The centre improved the capacity of Angolan SMEs to prepare bids and serve as contractors in the oil sector. From its inception until its rebranding in 2013, the CAE provided training and technical assistance to over 1,500 Angolan businesses; certified 124 companies as suppliers for the oil industry; and granted approximately 300 contracts or contract extensions to SMEs participating in the scheme, and supported the creation of more than 2,700 jobs for Angolans (Kayizzi-Mugerwa and Anyanwu 2015).

Similar capacity-building experiences have taken place in the mining sector. In Chile, the shortage of skills needed in the mining sector and varying degrees of quality graduates produced in over 3,000 training centers prompted the big mining companies to set up a mining skills council (CCM) overseen by the Mining Council.²¹ The CCM undertook a skills gap analysis of the industry and, armed with the findings, designed career paths and training packages in collaboration with training institutions and potential workers. This approach has enabled CCM to provide a means of meeting the quality and training standards required by the industry and to build skills required to pursue different opportunities in the mining sector.²²

5. Conclusion

In this note, we propose a new concept of sustainable job creation as the job creation *process* that promotes economic growth, social inclusion and environmental protection. We have reviewed the economic dimension of the job creation process in the extractive industries, the three channels through which jobs are created and policy lessons to stimulate job creation in the extractive industries. The environment and social dimension of the job creation process has not been adequately addressed in the note due to the limitation of the current literature. One possibility is to complement the desk review with country case studies to explore the environmental and social dimension of the job creation challenge.

²¹ The Mining Council is an organization that unites the large mining companies in Chile.

²² <https://sharedvalue.org/groups/mining-skills-council-creates-common-framework-address-industry-skills-gap>

At the 17th Africa OilGasMine, over its three-day programme, participants will explore the various facets of the theme: legal and regulatory frameworks for developing a sustainable industry; challenges and opportunities for job creation in artisanal and small-scale mining; training and capacity-building needed to generate better jobs in the extractive industries; innovations and technology transfer; partnerships in the mining and petroleum sectors; the participation of women in the extractive industries, and last but not least, the role of renewable energy as an engine for green job creation.

The discussions at the conference shall further enhance the participants' understanding, including ours, on how to ensure that the job creation process in the extractive industries promotes sustainable development.

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