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EXTRACTIVE INDUSTRIES SECTOR FRAMEWORK DOCUMENT

FISCAL MANAGEMENT DIVISION

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ABBREVIATIONS

API	American Petroleum Institute
CIMA	Centro de Información Minera Argentina [Argentine Mining Information Center]
CIT	Corporate income tax
DDPLAC	Deep Decarbonization Pathways in Latin America
ECA	Economic Commission for Africa
ECLAC	Economic Commission for Latin America and the Caribbean
EITI	Extractive Industries Transparency Initiative
ESIA	Environmental and Social Impact Assessment
FATF	Financial Action Task Force
GT	Government take
GtCO ₂	Gigatonnes of CO ₂
ICJ	International Commission of Jurists
IEA	International Energy Agency
IFC	International Financial Corporation
IISD	International Institute for Sustainable Development
ILO	International Labor Organization
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
JETA	Joint Education and Training Authority
LAC	Latin America and the Caribbean
NRC	Natural resource company
NRGI	Natural Resource Governance Institute
OECD	Organisation for Economic Development and Cooperation
OGP	Open Government Partnership
PSC	Production sharing contract
RGI	Resource Governance Index
SDG	Sustainable Development Goal
SFD	Sector Framework Document
UNDP	United Nations Development Programme
USGS	U.S. Geological Survey

EXECUTIVE SUMMARY

The extractive industries, which encompass the production of fossil fuels (oil, gas, coal) and mining, play a strategic role in countries' social, environmental, and economic development. Latin America and the Caribbean is the main international source of metals and the fourth most important source of hydrocarbons in the world; their coal reserves also account for 1.4% of the world total. This natural wealth is a source of opportunity for the countries, but it is not a guarantee of sustainable development. To transform this nonrenewable capital into environmentally sustainable and socially inclusive wealth, institutional frameworks and coordination mechanisms are needed to align the incentives of multiple stakeholders in the extractive industries across the entire value chain, so that extractive projects are implemented responsibly and create shared value. To leverage the resources and opportunities created by the extractive industries, this Sector Framework Document (SFD) presents five challenges that have been identified in countries in the region that are intensive in resource extraction.

The first challenge is to design an institutional and governance framework that promotes economically, environmentally, and socially sustainable development based on principles of economic efficiency and productivity in the extractive industries. In the case of Latin America and the Caribbean, the full implementation of institutional frameworks for extractive industries based on the experience of developed countries is challenging. Firstly, the development of an integrated institutional framework for the extractive industries remains a work in progress. Secondly, institutional capacities need to be further strengthened if contracts in the extractive industries are to be negotiated and monitored effectively. Lastly, there is a need to improve institutional arrangements that enhance the ability of natural resource companies to improve their efficiency.

The second challenge is to promote socioenvironmental sustainability, shared value generation, integration, and economic diversification. Promoting inclusive policies with a long-term vision for the sector will be key in order to improve socioenvironmental sustainability and opportunities for all. In particular, multi-stakeholder initiatives and mechanisms must be established that integrate efforts by government, industry, and civil society, as well as strengthen spaces for local community engagement in sector governance, encompassing all stages of the life cycle of extractive projects. Moreover, communities' human rights must be safeguarded and impacts on ecosystem services managed in an integrated fashion, taking into account the water-energy-land nexus. In addition, there is a need to facilitate the implementation of policies that are gender focused and based on the participation of all groups, with particular attention to indigenous peoples, Afro-descendant communities, and vulnerable segments of the population. At the same time, to increase benefits from the sector and reduce countries' dependence on the extractive industries, production chains and alternative economic activities should be strengthened. To this end, priority should be placed on the use of resources from extractive activities for human capital, health, public infrastructure, and research and development. Key to this is ensuring that resources generated by the extractive industries are adequately shared and efficiently executed by central and subnational governments and that institutional capacities are strengthened at the local level. Lastly, against the backdrop of the economic crisis caused by COVID-19, it is important to redirect sector investments to activities that promote a green recovery.

The third challenge is to manage the risks arising from the transition to low-carbon economies. The energy transition process, associated with implementation of the Paris Agreement, affects demand for fossil fuels produced in Latin America and the Caribbean

and constitutes a vulnerability for extractive industries in the region. Moreover, the crisis sparked by COVID-19 could have the effect of either accelerating or slowing the economies' decarbonization processes, a source of uncertainty for the region that will have to be managed. Of particular importance is the risk of stranded assets—which include resources left in the ground or physical assets that are devalued or retired before the end of their expected useful life due to the energy transition—as well as the possible effects on social groups, such as sector workers. To mitigate these risks, it is critical that energy, climate, and fiscal plans be aligned in support of an orderly transition that is consistent with green growth agendas. Abandoning the cost and distortions of fossil fuel production subsidies must also be a priority. Lastly, the region should prepare to tap the economic growth and job creation opportunities provided by the energy transition, particularly in the mining sector.

The fourth challenge is to efficiently manage the public finances in a context of volatile commodity prices and the depletion of resources. In economies in the region with large extractive industries, government revenue is volatile and highly dependent on the sector. Accordingly, there is need to implement and strengthen fiscal institutions that help to manage this risk. Fiscal rules have been a key institution in this sense; these have been only partially successful due to problems in design and implementation. Firstly, only some countries with large extractive industries have established fiscal committees and/or councils, and this remains a challenge for improving fiscal rule effectiveness and compliance. Secondly, weaknesses in the design of some sovereign funds limit their effectiveness, while the use of financial hedging tools is limited in the region. Lastly, Latin America and the Caribbean faces the challenge of implementing fiscal regimes to improve revenue collection and the distribution of risks between private parties and governments in the extractive industries.

The fifth challenge is to strengthen transparency and integrity in management of the extractive industries. There are gaps in Latin America and the Caribbean in terms of the prevention of corruption in extractive industries. More than half of the countries in the region have transparency laws, but only some of them include sections specifically relating to the sector, and there are barriers that hinder compliance. In addition, further progress needs to be made in strengthening beneficial ownership transparency. In terms of exploitation rights, there are information gaps in the processes for granting rights and licenses. Fiscal information on revenues from the extractive industries is deficient, and tax confidentiality is a legal barrier to transparency in the sector. There is also still work to do in terms of deepening the auditing of sovereign funds and transfers to subnational governments. Lastly, good governance principles in natural resource companies need to be strengthened.

This sector framework document provides a guide to ensuring that the extractive industries contribute to environmentally sustainable and socially inclusive economic development in Latin America and the Caribbean. To that end, and in light of the identified challenges, five lines of action are proposed, based on both international best practices in managing the extractive industries and lessons learned by the IDB Group: (i) strengthen the design and implementation of institutional frameworks for the extractive industries in the region; (ii) promote the development of sustainable and inclusive institutions and policies that mitigate socioenvironmental risks, generate opportunities for all, and promote economic diversification; (iii) strengthen institutions to facilitate the transition to low-carbon economies, including managing the risk of stranded assets and identifying new opportunities in the sector; (iv) advance the development of

fiscal institutions to manage revenue volatility and increase the progressivity of fiscal instruments; and (v) promote transparency and integrity in the extractive industries.

I. THE EXTRACTIVE INDUSTRIES SECTOR FRAMEWORK DOCUMENT IN THE CONTEXT OF EXISTING REGULATIONS, THE INSTITUTIONAL STRATEGY, AND INTERNATIONAL AGREEMENTS

- 1.1 The Extractive Industries Sector Framework Document has been prepared based on the document “Strategies, Policies, Sector Frameworks and Guidelines at the IDB” (document GN-2670-5), which provides guidelines for the preparation of sector framework documents (SFDs).** These are knowledge documents that provide guidance in responding to the diversity of challenges and institutional contexts to which the IDB Group's borrowing member countries are exposed, as well as significant orientation for IDB Group specialists and a clear idea of the challenges that the IDB Group seeks to address in the sector.
- 1.2 This Sector Framework Document on the Extractive Industries is consistent with the Second Update to the Institutional Strategy 2020-2023 (document AB-3190-2).** It is also consistent with the Sustainable Infrastructure Strategy for Competitiveness and Inclusive Growth (document GN-2710-5), the Integrated Strategy for Climate Change Adaptation and Mitigation and Sustainable and Renewable Energy (document GN-2609-1), the Sector Strategy on Institutions for Growth and Social Welfare (document GN-2587-2), the Sector Strategy to Support Competitive Global and Regional Integration (document GN-2565-4), the Fiscal Policy and Management Sector Framework Document (document GN-2831-3), the Decentralization and Subnational Governments Sector Framework Document (document GN-2813-8), the Energy Sector Framework Document (document GN-2830-7), the Urban Development and Housing Sector Framework Document (document GN-2732-6), the Citizen Security and Justice Sector Framework Document (document GN-2771-7), the Water and Sanitation Sector Framework Document (document GN-2781-8), the Transparency and Integrity Sector Framework Document (document GN-2981-2), the Integration and Trade Sector Framework Document (document GN-2715-11), and the IDB Group-Civil Society Engagement Strategy (document GN-2232-6).
- 1.3 This SFD complies with the IDB Environmental and Social Exclusion List established in the Environmental and Social Policy Framework (document GN-2965-23).** The focus of this SFD is on strengthening the institutional, legal, and regulatory framework for the extractive industries, as well as on improving the local policy frameworks associated with the sector and its management instruments. It does not focus in any way on direct investments in mining projects for oil, gas, and coal exploration and development. Furthermore, this SFD seeks to strengthen socioenvironmental aspects of the extractive industries, including improvements in the implementation, monitoring, and supervision of environmental and social performance.
- 1.4 This SFD is aligned with the following Sustainable Development Goals (SDGs):** SDG 5: Achieve gender equality and empower all women and girls, given that there tends to be gender violence and a primarily male workforce in areas in which the extractive industries operate; SDG 6, Ensure availability and sustainable management of water and sanitation for all, inasmuch as efforts should be made to reduce the environmental risks posed by the extractive industries; SDG 8, Promote inclusive and sustainable economic growth, employment, and decent work for all, such that the resources obtained by the extractive industries are distributed equitably among the various actors in the economy and extractive

operations are carried out under proper labor conditions; SDG 12, Ensure sustainable consumption and production patterns, given that the activities of the extractive industries can result in irremediable environmental damage; SDG13, Take urgent action to combat climate change and its impacts, whereby the resources produced by the extractive industries can support the low-carbon transition; and SDG 16, Promote fair, peaceful, and inclusive societies, in accordance with which the activities of the extractive industries are carried out in consensus with the region's communities in order to prevent conflict and reduce the risks of corruption.

- 1.5 This SFD focuses on the sectors of fossil fuels (oil, gas, and coal) and mining, which account for a large percentage of the value added of GDP in Latin America and the Caribbean. In total, the extractive industries account for one quarter of world GDP. Economic rents in Latin American and Caribbean countries with extractive industries account for around 10% of regional GDP and 1.2% of total worldwide rents ([Figure 1](#)).
- 1.6 **The region accounts for a significant share of worldwide mineral reserves.** Argentina and Chile possess 61% of world lithium reserves¹ (essential for battery production), while 39% of copper reserves (essential for electricity conduction) are found in Peru, Chile, and Mexico. A full 37% of global silver reserves are found in Peru, Chile, Mexico, Bolivia, and Brazil, while 15% of gold reserves are located in Argentina, Brazil, Mexico, and Peru. Brazil has 17% of world reserves of iron ore and 8.7% of bauxite (used to produce aluminum). The region also has substantial reserves of tin (key for electronics soldering), molybdenum (essential in steel alloys), zinc, boron (common in the manufacture of glass and ceramics), antimony (used in fire retardants and batteries), niobium (critical for steel production), coal, nickel, manganese (also key for steel and aluminum alloys), lead, and other minerals critical to the world economy (USGS, 2020).
- 1.7 **Latin America and the Caribbean contribute significantly to mineral production.** The region accounts for one fifth of world production of gold, tin, bauxite, and zinc, 13% of iron, and around one tenth of lead and nickel (USGS, 2020). Chile and Peru represent 43% of world copper production. With respect to lithium, Chile and Argentina are the second and third largest producers in the world, respectively. Mexico and Peru lead silver production, with 50% of the total. Brazil is the second largest producer of iron in the world and the fourth largest producer of bauxite (USGS, 2020).
- 1.8 **Latin America and the Caribbean is the second most important region in the world in terms of proven hydrocarbon reserves.**² In 2019, the region had 19% of proven world oil reserves, putting it in second place after the Middle East. Venezuela, Brazil, Ecuador, and Mexico rank among the top 20 countries in the

¹ Bolivia has some of the largest lithium deposits, but these have not yet been quantified as reserves. According to figures from the U.S. Geological Survey ([USGS, 2020](#)), the three top countries in the world in terms of lithium deposits are, in descending order, Bolivia (21 million tons), Argentina (17 million tons), and Chile (9 million tons). The rich confluence of lithium reserves and resources in these three countries is known globally as the Lithium Triangle ([BNAmericas, 2020](#)).

² Proven reserves are those which have the highest probability of being extracted in light of the technology, economic conditions, and available information at the time they are valued. In the case of hydrocarbons, reserves are considered proven if this probability is equal to or above 90%.

world in terms of oil reserves, while 14 of the Bank's 26 borrowing member countries have significant oil reserves, including Guyana, which has recently made major discoveries in the Stabroek Block. The region has 4.3% of global proven gas reserves, with Venezuela alone accounting for 2.9%. Eight of the world's 50 largest natural gas reserves are in Latin America and the Caribbean: Venezuela, Peru, Trinidad and Tobago, Brazil, Argentina, Bolivia, Mexico, and Colombia. Eleven borrowing member countries have natural gas reserves, including Chile, Ecuador, and Barbados (British Petroleum, 2020).

- 1.9 **The extractive industries are the main source of exports for many countries in the region.** On average, the extractive sector represents more than 25% of the region's goods exports. Metals and minerals alone accounted for 12% in the period 2013-2017, and 55% and 50% in Chile and Peru, respectively. Fuel exports accounted for 12% over the same period. In Venezuela, Colombia, and Trinidad and Tobago, the figures were 98%, 60%, and 57%, respectively. The numbers are lower in other countries but top 10% of goods exports in Bolivia, Ecuador, Paraguay, Jamaica, Suriname, Peru, and Belize. Even in more diversified economies such as Mexico and Brazil, hydrocarbons represent over 7% of total goods exports.
- 1.10 **The revenue generated by the extractive industries represents a large percentage of GDP in the region.** For example, in Suriname, Chile, Guyana, and Peru, mining revenue averages between 8.3% and 10% of GDP. Revenue generated by the hydrocarbon sector accounts for nearly 20% of Venezuela's economy (2011) and contributes over 5% of GDP in Trinidad and Tobago, Ecuador, Bolivia, and Suriname. Mexico and Colombia follow closely, with revenue in both cases near 4% of GDP between 2016 and 2020 (Cuadro 1).
- 1.11 **The energy transition presents an opportunity for the region's extractive industries to better leverage benefits as an offset against negative externalities.** To this end, the region should pursue transformative change in the extractive industries, including efforts as follows: (a) establish a more dynamic, flexible, and innovative institutional framework to make the industry more efficient and productive (Challenge 1); (b) achieve inclusive growth that advances the process of economic diversification and encompasses territorial development in the regions affected by the transition and their communities (Challenge 2); (c) manage the risks arising from decarbonization and the challenges involved in achieving sustainable growth, including, in the post-pandemic period, diversifying sector investments towards activities that promote a green recovery (Challenge 3); (d) efficiently manage the volatility accompanying mineral prices and the changes in demand (Challenge 4); and (e) consolidate a framework of transparency and access to information that promotes accountability (Challenge 5). Effective implementation of this transformation will require a detailed plan in the short and medium term that includes: (a) well-defined stages for implementation of the plan; (b) steps for dismantling obsolete infrastructure and the associated costs; and (c) a multiyear budget for implementing the transition. With the exception of Chile, the region does not presently have such a plan, a situation that could lead to delays, disruptions, and cost overruns for the countries (Chen, 2019; Campagnol et al., 2018).
- 1.12 **Yet many countries are net fuel importers.** The Central American and Caribbean countries are generally net importers of fuel for transportation and

power generation. With the exceptions of Mexico, Colombia, Panama, and Venezuela, fuels account for at least 10% of goods imports for all other countries in the region. In the Dominican Republic, the Bahamas, Barbados, Guyana, Jamaica, and Trinidad and Tobago, fuel imports have averaged more than 20% of imported goods over the last five years.

- 1.13 **The demand for minerals in the region will be driven by the boom in nonconventional renewable energies and the increased focus on green growth agendas.** The transition to low-carbon economies will require more minerals by 2050 than have been produced in the last 100 years. For example, more minerals and elements (common and rare earth alike) will be needed, including cobalt, lithium, nickel, and tellurium for batteries and electric vehicles,³ neodymium for wind turbines, copper for nearly all equipment, and terbium for end uses such as LED lights (Månberger, A. and Stenqvist, B.; Campagnol et al., 2018), as well as a number of minerals used to make mobile devices (Table 2). To reach the final consumer, the value chains for these elements, from mine to market, will have to be optimized. In particular, the expansion of electric mobility in Latin America and the Caribbean and technological innovations in the mining industry present a significant opportunity for growth and job creation in the region's mining sector (Hund and Reed, 2019; Arrobas et al., 2017). Meanwhile, urbanization will push world raw materials consumption up from 40 billion tons in 2010 to around 90 billion tons in 2050 (United Nations Environment Programme, 2018).
- 1.14 **The demand for hydrocarbons will continue to increase in the short term but in the long term will depend on climate policies and the development of more efficient power generation methods.** Estimates for oil demand in 2040 point to an increase of 10% (11.5 million barrels per day), while in the case of natural gas global demand is set to grow by 43%. Scenarios based on limiting the rise in global temperatures to less than 2°C point to a reduction of 26% in the size of the global oil market and growth of only 7% in natural gas (IEA, 2018). Other scenarios consistent with global temperature increases of less than 1.5°C show reductions of between 39% and 77% in oil demand and 13% and 62% in natural gas demand between 2020 and 2050 (IPCC, 2018). A challenge for the region, therefore, is to find a balance between making use of production in the short term and minimizing the risk of investing in infrastructure that could rapidly become obsolete if, for instance, demand were to fall drastically with implementation of the Paris Agreement or the combination of storage and renewable technologies were to make these fuels less competitive economically.
- 1.15 **Institutional failures make it difficult for countries to transform extractive resource wealth into sustainable, inclusive economic development.** The uncontrolled exploitation of extractive resources can damage the environment while neglecting climate change and the global energy transition, with adverse social effects. It is very common for the exploitation of extractive resources to become a source of conflict, creating poverty, corruption, and government mismanagement (World Bank, 2020). Extractive industries in countries with strong institutions tend to have greater spillover effects into society and other economic

³ Campagnol et al. (2018) estimate that between 2018 and 2030, rapid growth in the electric vehicle industry will translate into production of 340 million units of automobiles, buses, and cargo vehicles.

sectors (Lederman and Maloney, 2007; Balza and Manzano, 2013; Manzano, 2014). Strong institutions translate into fiscal instruments or legislation that help companies internalize aspects of social and environmental responsibility, including actions that promote employment, local content, commitments to communities in the areas of impact, and value-added in subsequent operations (downstream processing) (Addison and Roe, 2018). Likewise, institutions are a decisive factor in attenuating the negative effects of the extractive industries and commodity price volatility on economic growth (Rentschler, 2013; Difiglio, 2014; van de Ven, 2017). Moreover, institutions are key in strengthening the mechanisms for distributing resources obtained from the extractive industries. In countries with weak institutional frameworks, the results can be low economic diversification, poverty, inequality, marginalization, social conflict, and harmful environmental effects (Myers, 2005; Bazilian et al., 2013; Manzano et al., 2017; Kesler and Simon, 2015). Few countries have adopted policies and action plans to mainstream gender issues and analyze the impact of projects on women, children, indigenous peoples, and vulnerable populations (Oxfam, 2017).

- 1.16 **Sustainable and inclusive development in the extractive industries will require collaborative efforts across government, industry, and civil society.** If the extractive sector is to successfully navigate the challenges of the energy transition and become an engine of sustainable and inclusive development, governance of the extractive industries must be strengthened. Support will be needed for multi-stakeholder mechanisms and initiatives that integrate efforts by the government, industry, and civil society throughout all stages of the life cycle of extractive projects. At the local level, improving sector governance should encompass actions to strengthen institutions and build capacity leading to the creation of benefits that can be shared with the communities.
- 1.17 In the current context of the pandemic, the impact of COVID-19 on the future of markets for the extractive industries is uncertain. On one hand, hydrocarbon use could remain higher than expected: declining oil prices could increase fuel demand and delay the transition to low-carbon sources of energy. There will also be a short-term deceleration in the development of renewable energies (Hosseini, 2020). On the other hand, the social distancing imposed to combat transmission of the virus appears to be having a positive impact on the environment and air quality, raising awareness about the effects of human activity. Moreover, the use of low-carbon modes of transportation could persist after the pandemic ends, reducing demand for fuel and supporting the transition (Kanda and Kivimaa, 2020).⁴ It is not clear what the impact will be on the demand for fuel in the air transportation industry, as this will depend on the pace of economic recovery. In the case of mining, increased prices for metals such as gold may lead to improvements in profitability and pressure on production sites. However, the overall impact of price volatility is a slowing of investment decisions regarding the exploitation and development of other minerals, with effects across the entire value chain. In addition, logistical difficulties and challenges in implementing biosafety protocols have created serious difficulties for mineral extraction in the region. There will also be large losses in the oil sector, despite the expected recovery in prices at the end of 2020

⁴ However, many cities have also imposed limits on the use of public transportation in order to contain transmission of the virus, potentially increasing the use of motorcycles and private vehicles ([World Bank, 2020](#)).

and the beginning of 2021 (Jefferson, 2020). To contain this uncertainty, it is paramount that the institutional framework for extractive industries be strengthened in the value chain so that the region can effectively leverage any potential increase in commodity prices to support the post-pandemic recovery (Natural Resource Governance Institute, 2020).

- 1.18 Supporting development of the extractive industries and the implementation of good practices in producer countries involves solving a variety of challenges. This includes (i) closing gaps in terms of good policy, governance, and institutional capacity in the extractive industries in Latin America and the Caribbean; (ii) designing government institutions and policies that support socioenvironmental sustainability, integration, and economic diversification; (iii) preparing decarbonization plans and strategies to manage the transition to low-carbon economies; (iv) supporting efforts to strengthen fiscal institutions in order to manage volatility; and (v) improving transparency and integrity in the extractive industries.
- 1.19 By strengthening institutions, providing resources for investment, and generating activity at the local level, the sector can make a significant contribution to the IDB Group's objectives of overcoming social exclusion and inequality, improving productivity and innovation, and fostering competitiveness.
- 1.20 **This document is divided into five sections.** Section I describes the general guidelines governing this SFD. Section II presents the main challenges relating to the extractive industries in Latin America and the Caribbean. Section III presents the international evidence and good practices in the sector. Section IV summarizes lessons learned that are relevant to the challenges identified in Section II, based on the IDB Group's operational experience. Section V, lastly, summarizes the lines of action that will serve as a reference point for the IDB Group in supporting the region's efforts to tackle the challenges identified in Section II.

II. MAIN CHALLENGES FOR THE REGION IN THE EXTRACTIVE INDUSTRIES

- 2.1 **The exploitation of extractive resources has not always translated into higher levels of development for countries in the region.** Countries rich in hydrocarbons and mineral resources often demonstrate poor economic performance and high poverty levels, despite the income flows from extractive operations. The most well-known explanations for this paradox include the “resource curse” and/or “Dutch disease” (Sachs and Warner, 2001; Tornell and Lane, 1999).
- 2.2 **As a result, transforming underground wealth into economic prosperity requires improvements to institutional capacity and the management of resources.** Good governance⁵ reduces the possible negative effects of the extractive industries (Sala-i-Martin and Subramanian, 2003; World Bank, 2004; International Monetary Fund, 2007). Accountability, trust between stakeholders, the prevention of corruption, and the quality of the institutions that manage the extractive industries are all essential for good governance and inclusive, sustainable development in countries rich in extractive resources (Florini, 2007;

⁵ Governance refers to the rules, institutions, and processes that determine how nonrenewable natural resources are used and how their benefits are distributed.

Kaufmann et al., 2009; Søreide, 2012; Revenue Watch Institute, 2013; Vieyra and Masson, 2014). To achieve this, there is a need to build competitive business environments, attract investment, allocate exploration and exploitation rights efficiently, establish fiscal regimes that balance government and private sector interests and risks, develop effective environmental and social policies, and ensure transparency in the sector (Addison and Roe, 2018; Annex III).

2.3 This section addresses the challenges of the extractive industries in Latin America and the Caribbean across the entire value chain (Table 3). First, it analyzes the challenges of the institutional and governance framework for the sector. Secondly, it studies the gaps that the region faces in achieving socially and environmentally sustainable growth and economic diversification through the use of extractive resources. Thirdly, development of the sector is analyzed against the backdrop of managing the risks of the transition to low-carbon economies. Fourthly, in light of the substantial fiscal resources generated by extractive industries, the section discusses approaches to efficiently managing volatile prices for raw materials and the depletion of those resources. Lastly, the transparency and integrity of the extractive industries needs to be strengthened if the sector is to generate spillover effects.

A. Challenge 1. Design an institutional and governance framework that promotes economically, environmentally, and socially sustainable development based on principles of economic efficiency and productivity in the extractive industries

2.4 Output from the region's extractive industries has stagnated over the last decade. Although proven reserves rose by 39% in the region between 2009 and 2019, production of hydrocarbons fell by 22%, with sharper declines in countries such as Mexico and Venezuela (36% and 70%, respectively).⁶ Moreover, the ratio of proven reserves to production was 143 in 2019, the highest in the world, representing high potential production for the region that is not being utilized. Mining production has also stagnated, reflected in a drop in the region's share of global mineral production from 7.2% to 6.2% between 2008 and 2019.⁷ This low growth is associated with high production costs and low levels of investment.

2.5 Weaknesses in institutional arrangements and capacities have curtailed the efficiency of sector. The cycle of high metal and mineral prices in the 2000s led to rising profitability in the extractive industries. Increasing production volumes became a priority, at the expense of improved efficiency (Altomonte and Sánchez, 2016). High prices also encouraged the development of low-productivity deposits (Göbel and Ulloa, 2014). There was also a generalized decline in sector productivity, which lasted until the end of the cycle of high prices between 2013 and 2015. In Chile, for example, labor productivity fell by 15% between 2000 and 2014, while total factor productivity in mining declined by 14% ([National Productivity Commission, 2017](#)).⁸ The subsequent drop in prices highlighted the absence in the region of adequate monitoring of productivity and institutional

⁶ See [Statistical Review of World Energy](#).

⁷ See [World Mining Data](#).

⁸ A 19% increase in copper production from 2000 to 2014 required 79% more energy, 157% more labor, and 178% more capital. Operators had to extract and process 40% more mineral due to a reduction in ore quality and the effects of mine aging.

conditions aimed at ensuring greater efficiency. The prevailing institutional framework, regulation, and policies affect production costs by establishing the standards for developing projects; they also affect production conditions in each sector (oil, gas, and mining) depending on its specific characteristics (Table 4). In addition, they affect monitoring and compliance costs and establish risk management mechanisms (Jara, 2017; [Asia-Pacific Economic Cooperation, 2017](#)).

- 2.6 **Institutional frameworks for the extractive industries in Latin America and the Caribbean have undergone substantial changes in the last 50 years that have created challenges for their stability and management.** Different policies in the areas of private investment liberalization, contract models, and State control have produced a high degree of heterogeneity in legal frameworks across the countries of the region. Brazil, Colombia, and Peru further liberalized their sectors while improving regulation and the clarity of operating rules in the hydrocarbons sector, leading to increased investment and production levels during the commodities boom (2010 to 2014). Argentina, Bolivia, and Ecuador introduced reforms in 2005, 2010, and 2012, respectively, that saw them return to a model based on extensive State participation. These changes have led to low levels of investment in their extractive industries and hindered their management and administration (Balza and Espinasa, 2015). This has meant the development of hybrid models (contracts and concessions) that still persist in some countries in the region, which complicates the task of managing these sectors (Table 5).
- 2.7 **Development of an integrated institutional framework for extractive industries remains a work in progress.** The region needs to move forward with the introduction and harmonization of institutional frameworks applicable to the entire value chain, as well as mechanisms to ensure that these are complied with. This includes environmental and health and safety standards, employment and tax regimes, and international treaties—areas that are not always included in hydrocarbon and mining laws. The lack of integration limits coordination of the sector, affects its legal stability, increases the institutional burden, and hinders the management of its effects on the environment and communities (Cameron and Stanley, 2017; Fraser Institute, 2019). Moreover, given the importance of extractive industries in the region and the wide range of actors that participate in the value chain, the strengthening of these frameworks, accompanied by improvements in governance, will be vital for insulating the industry from phenomena such as institutional capture, in which private interests attempt to intervene in the design of laws, policies, regulations, and contracts to promote their own interests (Hellman and Kaufmann, 2000). The lack of integration of the regulatory frameworks is a barrier to formalization and supervision in particular of artisanal and small-scale mining. Although some countries in the region (i.e. Bolivia, Chile, Guyana, and Suriname) have moved ahead in establishing mechanisms for the acquisition of specific rights for artisanal and small-scale mining as a way to promote formalization, there are still gaps in the design process that make compliance and supervision difficult ([Box 2](#)).
- 2.8 **Greater capacity is needed for the coordination of central and subnational government bodies.** Gaps in specialized technical knowledge, the operational capacity of the institutions implementing these frameworks, and coordination among those institutions all need to be overcome (de Sa and Espinasa 2018; Crespi et al., 2014; Vieyra and Masson, 2014; Vieyra et al., 2019; Vio Gorget and

Walter, 2017). In government bodies involved in the extractive industries in Latin America and the Caribbean, there is usually a lack of clarity regarding the institutional roles, mandates, and responsibilities that underpin effective management, leading to overlapping or ambiguous functions and responsibilities, as well as unassigned tasks. In some countries, for example, regulatory agencies perform multiple functions that are shared between the agency and the sector ministry. These coordination problems are much more pronounced between the different levels of government. In many countries, it is usual for central government directives to exceed the capacity of subnational governments to fulfill and administer them (Addison and Roe, 2018). This is a particularly critical issue where the ownership and control of resources belongs to decentralized regional entities.

- 2.9 **Given the variety of contractual arrangements in the region, there is a need to build institutional capacities for effective contract negotiation and monitoring.** The extractive industries require updated, clear, and robust regulatory frameworks that support and regulate contractual agreements and establish monitoring mechanisms for these (Vio Gorget and Walter, 2016). In Latin America and the Caribbean, contracts have been an integral part of the institutional framework, laying down the specific arrangements between the government and the companies. The agreed conditions influence productivity in the sector and economic activity through operating and investment plans. Multinational companies tend to be in a stronger position given their superior knowledge of the market, costs, and prices (Cotula, 2010). In addition, some countries have negotiated special contractual terms not envisaged in the legislation, resulting in ad hoc agreements that do not follow international best practices. In light of this, it is important that the officials responsible for negotiating contracts possess specialized technical knowledge that ensures that they are able to negotiate successfully and benefit from the transfer of knowledge from the private sector (Reyes-Tagle, 2018).⁹ This specialized knowledge should include the specific characteristics of the oil, gas, and mining sectors (Table 4), with the aim of ensuring that the necessary contract provisions are successfully incorporated (Cameron and Stanley, 2017).
- 2.10 **The extractive industries in Latin America and the Caribbean have been characterized by the strong presence of natural resource companies (NRCs), the management of which has affected their efficiency.** The presence of NRCs in Latin America and the Caribbean has been extensive in the area of hydrocarbons (i.e. Bolivia, Ecuador, Mexico, and Venezuela) and, in some cases, in mining (i.e. Chile and Brazil). Some NRCs have opened up to private investment or market competition, altering their commercial roles (Campodónico, 2004).¹⁰ Noteworthy cases include CODELCO in Chile and ECOPETROL in Colombia (88% government participation). Inefficient management, governance problems,

⁹ In Mexico in the 1990s, the model of Investment Projects with Deferred Recording of Expenditure (PIDIREGAS) was used to attract private investment and financing for energy, oil, and gas infrastructure. This model required agreements that demanded strong institutional arrangements and capacities for project monitoring.

¹⁰ Some NRCs in the region were established with noncommercial roles (regulators, fiscal agents, contributing to national oil security, creating jobs, selling fuel at subsidized prices, or financing social and infrastructure spending), and these have often undermined integrated fiscal management and efficient, transparent policy (Musacchio and Pineda, 2019).

and weak supervision of NRCs can generate significant economic and fiscal costs (McPherson, 2010; Tordo et al., 2010). In addition, the strong presence of unions, a lack of budgetary independence, heavy debt burdens, and a lack of transparency lead to efficiency problems and weak innovation and development in NRCs (Hartley and Medlock, 2013; Musacchio and Pineda, 2019). These problems led Brazil, for example, to implement reforms to its State oil company ([Box 1](#)).

B. Challenge 2. Develop policies and institutions that promote socioenvironmental sustainability, opportunities for all, and economic integration and diversification

2.11 The evidence surrounding the impact of the extractive industries in Latin America and the Caribbean indicates that there are considerable opportunities to optimize their contribution to development in the region.

These include improvements in at least two dimensions: (i) the mitigation of socioenvironmental impacts and greater participation by interested parties, and (ii) the increased efficiency of economic integration and diversification policies in terms of capitalizing on the benefits of the extractive industries and reducing economic dependence on the sector. Institutional strengthening of the extractive industries plays an indispensable role in all these areas and should reflect a long-term, consensus-driven vision of the role of these industries in sustainable development and the creation of shared value. Argentina, Chile, Peru, and Colombia have made efforts to launch multi-stakeholder processes aimed at developing long-term visions for the extractive sector and aligning their sector policies (IDB, 2020).

2.12 Extractive activities can cause negative socioenvironmental effects, and it is therefore important to develop effective tools to mitigate these.

Extractive activities can lead to significant environmental impacts, such as contamination of the land, water, and air, deforestation, and the destruction of biodiversity. They can also place pressure on scarce or vulnerable resources such as surface water and groundwater (Arbeláez and Parra, 2020; Masson et al., 2013). On the social front, negative impacts can include those on health, access to water, and access to means of subsistence for adjacent communities (Masson et al., 2013). There are associated risks to the health of people working in the extractive industries. For example, mining has a poor track record on occupational health owing to miners' regular exposure to carcinogens, dust associated with respiratory illnesses, toxic gas from mercury, and high rates of injury and death (Cartwright, 2016; Elgstrand et al., 2017; Schrecker et al., 2018).¹¹ Extractive industry activities can also generate pollutant gases (Aragón et al., 2015) and release contaminants (Dudka and Adriano, 1997; Salomons, 1995). Oil spills pollute the soil and water and destroy livelihoods made from farming and fishing, exposing people to carcinogenic substances (Schrecker et al., 2018). Lastly, the contamination resulting from extractive industry activities stunts the growth of children and leads to anemia in young women (von der Goltz and Barnwal, 2014).

2.13 Development of the extractive industries in Latin America and the Caribbean has occasionally been associated with socioenvironmental conflict. The

¹¹ Miners face shortened life expectancy and higher rates of cancer, hearing loss, and incidence of disease (Driscoll 2007; Donoghue 2004; Landen et al., 2004).

[Atlas of Environmental Justice](#) indicates that approximately 40% of the 526 cases of conflict recorded in 17 countries in the region are the result of extractive activities.¹² Examples include conflicts due to environmental pollution in Brazil (Garcia et al., 2017) and mining in Peru,¹³ as well as conflicts with indigenous peoples and oil exploitation in Ecuador's Amazon region (Finer et al., 2008) and disputes over water use in several countries in the region (Saade Hazin, 2013). The number of conflicts relating to mineral extraction exceeds that for hydrocarbons (Sánchez et al., 2019). There are 277 reported mining conflicts in Latin America and the Caribbean ([Figure 2](#)). The risk of conflicts and possible lawsuits over extractive activities is intensified in indigenous territories, including violations of individual human rights and the collective rights of indigenous peoples¹⁴ (Schrecker et al., 2018; ICJ, 2016). Conflict prevention and resolution requires fluid, open, and respectful relations between the interested parties, focused on creating shared value, forging long-term visions, and building relationships of mutual trust.

- 2.14 **Communities in the areas in which extractive projects are located often face the risk of human rights violations.** This includes involuntary physical and economic displacement; violent episodes involving the security forces; the suppression of free expression, freedom of movement, and the right to protest; the criminalization of human rights defenders and social leaders; and division in the communities (Vieyra et al., 2019; ICJ, 2016). These problems are exacerbated when the community's position is not considered in decision-making processes (Woods et al., 2017). In cases of informal, artisanal, and illegal mining, there have been incidents involving child labor, labor exploitation, and significant environmental impact (Schrecker et al., 2018). In addition, high levels of migration and a predominantly male workforce in extractive activities increases violence against women and sexual abuse resulting from domestic disputes, alcoholism, drug use, and demand for sexual services (Jenkins, 2014). It is also important to note that there are challenges around land use, illegal activities, and crime associated with the extractive industries, such as deforestation, illegal mining, and drug trafficking¹⁵ (Wagner, 2016).
- 2.15 **In the case of artisanal and small-scale mining, there are incidents involving gender, child labor, labor exploitation, and environmental damages.** Nearly 1.5 million people are employed in artisanal and small-scale mining in Latin America and the Caribbean ([Box 2](#)). In general, the region faces significant challenges when it comes to advancing the formalization of artisanal and small-

¹² An analysis of 200 infrastructure projects affected by conflict in the region—mostly in the areas of natural resources, energy, and waste—explains that the problems are a reflection of the interaction of environmental, social, governmental, and economic factors. Weak planning, limited access to resources, a lack of benefits for the community, and an absence of adequate consultation were the most common reasons for conflict (Serebrisky et al., 2019).

¹³ See [Office of the Ombudsman](#).

¹⁴ These collective rights include physical and cultural survival, the right to land, and the right to preserve their way of life.

¹⁵ For example, illegal gold mining is prevalent in Latin America and the Caribbean. An estimated 28% of the gold mined in Peru, 30% in Bolivia, 77% in Ecuador, 80% in Colombia, and between 80% and 90% in Venezuela is illegal. In Peru and Colombia, the value of exports of illegally mined gold is estimated to top the value of cocaine exports. Furthermore, illegal gold mining has contributed to massive deforestation in the Amazon Basin (Global Initiative Against Transnational Organized Crime, 2016).

scale mining and managing its socioenvironmental impacts (IISD, 2017). In gold mining, for example, episodes of violence and social conflict between miners and adjacent communities, including indigenous communities, are common (Quijano Vallejos et al., 2020). Also prevalent are gender gaps, child labor, and, occasionally, the use of forced labor (Arcos Alonso and Rivera Guzmán, 2018; Hidrón and Koepke, 2014; ILO, 2002). In addition, negative health and environmental impacts include contamination with toxic and hazardous substances (e.g. mercury, acids, and bases); the formation of large pits that fill with stagnant water and cause subsidence; the destruction of vegetative cover, soil, and subsoil layers in mines and adjacent areas; the silting of nearby water sources from the disposal of solid and liquid waste; and contamination from the grease, oil, and fuel used in mining machinery (Pantoja Timarán and Pantoja Barrios, 2016; Molano et al., 2012).

- 2.16 **Management of the extractive industries should take into account the dependence and effects of these industries on natural capital and ecosystem services.**¹⁶ Latin America and the Caribbean harbors 50% of the planet's biodiversity and therefore faces the challenge of preserving its natural capital and ecosystem services in the face of economic development pressures. The extractive sector has direct, indirect, and cumulative effects on natural capital and ecosystem services, yet it also depends on these, either directly (e.g. mining and water) or indirectly, as many ecosystem services help to protect the infrastructure used by the sector (e.g. by preventing erosion or protecting against landslides and flooding) (Convention on Biological Diversity, 2018). Extractive industries also contribute to climate change, which can exacerbate the impact on biodiversity, natural capital, and ecosystem services. To prevent or mitigate these negative impacts, the region needs to strengthen environmental rules, standards, and procedures, including the circular economy,¹⁷ as well as ongoing monitoring of these impacts. In addition, new technologies can help to reduce the risks and impacts of extractive industries on the environment (Guillén, 2017; Corneau, 2019).
- 2.17 **The region has made progress in strengthening its institutional frameworks to mitigate the potential negative socioenvironmental effects of the extractive industries but still faces important challenges in implementing them.** Governments in Latin America and the Caribbean have taken steps to adapt and incorporate environmental protection and regulation standards and tools into national frameworks governing the extractive sector. All of the countries have laws that require environmental and social impact assessments (ESIAs)¹⁸ before any extraction project can take place (ELLA, 2013; Acerbi et al., 2014). However, institutional capacities for the design, evaluation, and implementation of ESIAs

¹⁶ Natural capital refers to the array of resources—including the ground (fertile soils, minerals, etc.), air, water, and all of the living organisms—that can be used to produce goods and services that offer benefits to humans, commonly known as ecosystem services.

¹⁷ For example, the region's countries lag considerably in establishing rules and regulations to promote a circular economy (Schröder et al., 2020). This includes efficient management of waste from extractive industries, as well as opportunities for recycling and reuse of tailings, water, waste rock, etc.

¹⁸ These studies include identification of the possible social, economic, environmental, and health and safety impacts of proposed programs, subsequent to which plans and strategies must be identified to avoid, reduce, mitigate, and compensate for negative socioenvironmental effects.

vary between countries. Chile and Peru¹⁹ have adopted important reforms aimed at optimizing the use of the tool, while in the cases of Colombia and Guatemala there are serious weaknesses ([Figure 3](#)). These weaknesses relate to a lack of appropriate approval criteria in the bidding process and the fact that approvals are not binding upon the responsible entity. Moreover, these evaluations are focused on the local area and do not consider potential regional, strategic, indirect, and cumulative impacts.

- 2.18 **The water-energy-land nexus at the local level represents a challenge that requires an integrated approach in order to ensure sustainability.** Development of the extractive industries is accompanied by increased demand for energy, water, and access to land. Water is used in the extractive industries to both extract and process raw materials.²⁰ In the Andean region, water usage linked to the extractive industries has displaced other uses such as agriculture and livestock (Brain, 2017; Helwege, 2015). Energy is used to extract, transport, and process materials. However, the infrastructure required to provide water, energy, and land-use services has generally been developed separately, without an integrated territorial vision. Accordingly, there is a need to strengthen the integrated planning of infrastructure for industrial and other purposes, as well as the development of regulatory frameworks that harmonize interactions between the three aforementioned sectors. There are examples in the region of extractive activities making a positive contribution in this respect.²¹
- 2.19 **Government institutions and extractive companies often experience difficulties in implementing gender- and diversity-based policies.** These are needed to ensure that women, indigenous peoples, and Afro-descendants have equitable access to the benefits generated by the extractive industries, while also facilitating their inclusion in the labor force and decision-making processes. One of the challenges in the sector is therefore to strengthen policies and programs that promote greater gender equality and diversity in the extractive industries (Stefanović and Saavedra, 2016), as well as approaches to preventing gender-based violence (Oxfam, 2002). Very few ministries responsible for the extractive industries have adopted policies and action plans aimed at mainstreaming gender equality and diversity approaches in the sector, but there are a number of initiatives that seek to reduce this gap.²² Committees established to promote equality and diversity issues in the extractive industries often lack both technical capacity and specialized knowledge of gender issues (Carlier, 2018) or

¹⁹ In Peru, the creation of the Environmental Assessment and Monitoring Agency (OEFA) and the National Environmental Certification Service for Sustainable Investment (Sinefa) has strengthened the government's regulatory capacity and the legitimacy of the ESIA's (ECLAC, OECD, 2016).

²⁰ Water quality and availability has a disproportionate impact on women due to the important role that they play in managing water resources: they are often the ones responsible for collecting, utilizing, and managing water in the household and in rainfed and irrigated agriculture.

²¹ In Arequipa, Peru, development of the Cerro Verde mine helped to finance integrated wastewater treatment for both the city and the mine. In Colombia, the oil industry is one of the least intensive in terms of water use. In addition, for each barrel of oil extracted it obtains five barrels of water, which, when treated, can be used for a variety of purposes.

²² The program "Emerging Women Leaders in the Extractive Sector," supported by the Bank, is one example (Kaufmann et al., 2019). Its objective is to empower and strengthen the leadership abilities of women with high management potential in the extractive industry, while also increasing their visibility (Vallenilla and Hallack, 2018).

do not have the resources needed to adequately fulfill their mandates or ensure their sustainability (Organization of American States, 2012).

- 2.20 **Extractive projects can have a disproportionately negative impact on indigenous populations.** Extractive activities frequently take place in indigenous territories, where adverse impacts are reflected in (i) a loss of territorial integrity and means of subsistence; (ii) disturbances to the cultural uses of land; (iii) changed ways of life; (iv) weakened governance; (v) the threat of diseases in the absence of any immunity; (vi) the erosion of subsistence practices and food security; and (vii) a weakening of social cohesion due to increased immigration and prostitution (ICJ, 2016; Flórez, 2013; Perafán, 2006). Accordingly, it is paramount that permanent mechanisms be created for coordination and consensus-building with a view to achieving agreements before exploration takes place, and that these last throughout the entire extractive project cycle.
- 2.21 **Countries dependent on the extractive industries tend to face challenges in terms of diversifying their economies and converting resource wealth into benefits for the population.** Economic diversification includes diverse destination markets for exports, production of a greater variety of products, and the incorporation of more complex technological processes into production, including in the extractive industries ([Box 3](#)). As a result of increased exports of extractive resources, many countries rich in these resources suffer the effects of “Dutch disease,” the main consequence of which is a loss of competitiveness in the economy's other tradable sectors (World Bank, 2015). This phenomenon leads to lower diversification and is important for two reasons. Firstly, the concentration of exports in the extractive sector produces macroeconomic and fiscal vulnerabilities associated with fluctuations in commodity prices and the depletion of these resources. Secondly, the extractive sector tends to generate few linkages with other sectors and is capital intensive, making little contribution to employment creation (World Bank, 2015; Venables, 2016). Recent evidence from countries rich in extractive resources indicates that greater diversification is correlated with research and development spending, levels of human capital, and the existence of public infrastructure and institutions that facilitate the creation of production linkages (Lashitew et al., 2020; Columbia Center on Sustainable Investment, 2016).
- 2.22 **Latin America and the Caribbean is behind the curve in terms of integrating and diversifying production, thus exacerbating the economic dependence on extractive industries.** The region initiated a process of deindustrialization alongside the boom in commodity prices from 2003 onwards; this increased the extraction of natural resources to the detriment of other sectors (Altamonte and Sánchez, 2016). The extractive sector is relatively weak in terms of production linkages²³ in the region. The extractive sectors in Latin America and the Caribbean have created few linkages and tend to exist in the form of production enclaves. In Latin American and Caribbean countries such as Chile and Peru, in which the

²³ This refers to production linkages between the extractive industries and sectors that either provide goods and services to them (backward linkages) or process their output (forward linkages). Linkages are measured by means of an input-output matrix, and backward linkages from the extractive industries tend to offer greater development potential. Unfortunately, most Latin American and Caribbean countries lack updated input-output matrices that help to understand the strength of the sector's productive linkages and how they have evolved over time.

extractive industries play a significant role, export sophistication indices are declining steadily (Hausmann, 2014). With the exception of Mexico, Latin America and the Caribbean have lower levels of manufactured exports than other countries rich in natural resources, and lower levels of value added (Arbeláez and Parra, 2020). On average, primary exports in Latin America and the Caribbean (excluding Mexico) accounted for 50% of the total in 2016, with natural-resource-based products representing 23%. Less than 5% of total exports were concentrated in high-technology manufactured goods, and only 15% were medium technology ([Figure 4](#)). To a large extent, this is the result of low spending in the region on research and development,²⁴ which is an essential element in innovation, diversification, and economic growth processes (Mewes and Broekel, 2020; Guimón et al., 2018).

- 2.23 **The resources generated by the extractive industries represent an opportunity for financing public investment in education, health, infrastructure, and other public goods essential for inclusive growth and diversification.** The countries of the region took advantage of the boom in commodity prices from 2000 to 2014 to reduce levels of poverty and inequality (IMF, 2018).²⁵ Despite this, there are still significant gaps in terms of investment in human capital. For example, the Latin American and Caribbean countries allocate far fewer resources per student than the OECD countries and perform worse in standardized testing (Izquierdo et al., 2018). Similarly, while the region spends a total of 7% of GDP on health, in the OECD countries the figure is 12% (Izquierdo et al., 2018). Another element that helps to align the use of income from the extractive industries with targets for growth is public investment in long-term projects with a high social return. To eliminate its infrastructure gap, the region needs to increase annual investment from around 3% of GDP to between 4% and 7% of GDP (Serebrisky et al., 2015; Serebrisky et al., 2017; Bhattacharya et al., 2012; Perrotti and Sánchez, 2011).
- 2.24 **Spending effectiveness is indispensable for leveraging income from the extractive industries.** Low human resource productivity and weak institutional systems for managing spending reduce the countries' ability to convert resources from the extractive industries into high-quality spending (Izquierdo et al., 2018). Public investment has been used as a fiscal adjustment variable in times of adversity (Izquierdo et al., 2018). In addition, investment resources tend to be focused in urban areas, limiting regional convergence (Pineda et al., 2018). In terms of public investment management, while some countries exhibit high levels of efficiency (i.e. Bolivia, Chile, Peru, and the Dominican Republic), in others there is a pressing need to strengthen human resources and public investment systems across the entire project cycle (Armendariz et al., 2016).
- 2.25 **Together with the institutional strengthening of local governments, the effective distribution of resources generated by the extractive industries between the central and subnational levels of government is essential for**

²⁴ While Japan, the United States, and the European Union channel a high proportion of resources into this category (3.1%, 2.7%, and 1.6% of GDP, respectively), countries in the region spend on average just 0.5% of GDP ([World Bank](#) and [OECD](#)).

²⁵ Poverty in the region fell from 27% to 12%, while inequality dropped by 11% over the same period (IMF, 2018).

channeling benefits to communities. An inadequate distribution of resources can lead to higher levels of social conflict and corruption, reducing the benefits of the extractive industries (Arbeláez and Parra, 2020; Ardanaz and Maldonado, 2017). Accordingly, one of the challenges for the region is to correct the regressivity of the revenue distribution system that exists in most countries, as well as the absence of regional equalization mechanisms, which increases regional disparities (Muñoz et al., 2017). It is important to bear in mind that institutional limitations are particularly acute at the subnational level of government and where extractive projects are undertaken in remote areas.

C. Challenge 3. Manage the risks arising from the transition to low-carbon economies

- 2.26 **Future demand for fossil fuels will depend on climate policies and the energy transition.** In Latin America and the Caribbean, more than 60% of CO₂ emissions and almost 45% of greenhouse gas emissions are associated with the use of fossil fuels ([Figure 5](#)). To this end, future demand for fossil fuels will be affected by changes in: (i) policies to reduce greenhouse gas emissions; (ii) renewable energy generation technologies and their adoption in the energy sector;²⁶ and (iii) fiscal regimes that respond to the transition to low-carbon economies.
- 2.27 **The demand for fossil fuels from Latin American and Caribbean countries is vulnerable to the energy transition process associated with fulfillment of the Paris Agreement.** The objective of the Paris Agreement is to limit global warming to below 2°C above preindustrial temperatures and pursue efforts to limit it to 1.5°C. To this end, countries have submitted Nationally Determined Contributions (NDCs). Most of these contributions include reductions in emissions from the electricity sector, which will have implications for fossil fuel demand (González-Mahecha et al., 2019; Schaeffer et al., 2019). Significant changes are also expected in the demand for fossil fuels from the transportation sector. In 2018, the Intergovernmental Panel on Climate Change (IPCC) demonstrated the urgency of achieving the more ambitious target of 1.5°C ([IPCC, 2018](#)), which would require deeper global reductions between 2020 and 2050 in the amount of energy supplied by oil of between 32% and 74%, by natural gas of between 13% and 60%, and by coal of between 93% and 99%.²⁷
- 2.28 **Stranded assets created by the energy transition could have serious adverse consequences for the region.** Stranded assets include oil, gas, and coal fields that remain untapped due to the energy transition, as well as exploitation, transportation, processing, and utilization infrastructure (Binsted et al., 2019). In addition to the impact on extractive companies, one of the main risks associated with stranded assets is a drastic decline in government revenue from the extractive sector.²⁸ For example, if the Paris Agreement targets are met, between 66% and 81% of Latin American and Caribbean oil reserves would be left unexploited as of

²⁶ In many parts of the world, renewable energies are already the cheapest technology, and worldwide renewable electricity generation capacity is growing at a faster pace than that based on fossil fuels (REN21, 2019).

²⁷ These figures correspond to the interquartile ranges drawn from an extensive bibliographical review performed by the IPCC (2020).

²⁸ The magnitude of this type of risk has been observed during the current pandemic, which saw oil prices fall by 68% between January and May 2020 due to lower demand.

2035 and tax revenue would decline by between US\$1.3 trillion and US\$2.6 trillion (Figure 6).

- 2.29 **There is currently no consistency between countries' mining and energy, climate, and fiscal objectives, and this represents an obstacle to an orderly process of energy transition in Latin America and the Caribbean.** The region continues to exploit its extractive resources in a manner that is inconsistent with agreed targets for greenhouse gas emissions under the Paris Agreement (González-Mahecha et al., 2019). For example, it is estimated that if all fossil fuel electricity plants planned or announced in the region were built, committed emissions levels from the sector would reach 13.6 gigatonnes of CO₂ (GtCO₂), which is around double the current volume of 6.9 GtCO₂ and far above the target of 5.4 GtCO₂ (IDB and DDPLAC, 2019; González-Mahecha et al., 2019). At the same time, governments in the region face the challenge of developing long-term strategies that anticipate costs, deal with compensation, and ensure a fair transition, being careful to minimize the impact on social groups that might be negatively affected, such as workers in the fossil fuel industries (IDB and DDPLAC, 2019). In Chile, for example, dialogue between the government and other involved sectors has allowed an evaluation of the synchronization of coal plant closures before 2050, as well as the potential use of compensation policies to support the worst affected communities (IDB and DDPLAC, 2019; Inodú, 2018).
- 2.30 **There is also a need to address the costs and distortions created by subsidies for fossil fuel production in the region.** In 2015, the countries of Latin America and the Caribbean provided more than US\$40 billion in subsidies to fossil fuels, approximately 5% of the world total (Coady et al., 2019). The indirect costs associated with these subsidies—air pollution, global warming, congestion, accidents, damage to road infrastructure, and consumption taxes left uncollected—total around US\$156 billion (Coady et al., 2015). Nonetheless, from 2013 to 2016 fossil fuel subsidies fell in 76 countries, including Argentina and Mexico. The level of subsidies in 2017 was 40% of that in 2013 (OECD/IEA, 2019). The experiences of Chile, Mexico, and Ecuador, however, indicate that for changes in this area to be successful, the political, economic, social, and climate consequences must be taken into account (Schaffitzel et al., 2019). There is also space in the region for the implementation of green fiscal reforms, including carbon taxes, an area in which Chile, Colombia, and Mexico have made progress.²⁹
- 2.31 **The energy transition will entail a more intensive use of minerals and metals than in the past, which will represent a challenge for the extractive industries sector while opening up new opportunities for the mining sector in the region.** The stronger focus on green growth agendas and the new technologies in the area of renewable power generation and electrification will increase the demand for minerals (Table 6).³⁰ Much of the demand for energy and investment will be in the developing countries, given their rising demand curve for energy compared with the flat demand curve in more developed countries, such that the

²⁹ In 2014, Chile approved a tax on motor vehicle purchases and in 2017 it introduced a tax on stationary sources of pollution. Mexico implemented a tax on the sale and import of fossil fuels in 2014. Meanwhile, Colombia introduced a carbon tax on fossil fuels in 2016.

³⁰ This includes the manufacture of windmills, solar panels, batteries for storage, electric vehicle engines, and carbon capture and storage systems.

transition will highlight the importance of being prepared for opportunities that produce value added (beyond the extraction of minerals and metals) and earnings in Latin America and the Caribbean (Table 6). To meet this higher world demand, production of minerals such as graphite, lithium, and cobalt could increase by as much as 500% by 2050. More than three billion tons of minerals and metals will be needed to support the transition to renewable energies that is required to keep global warming below 2°C (Hund et al., 2020).³¹ Latin America and the Caribbean, which produce multiple minerals, are in an excellent position to provide the raw materials necessary for this energy transition (Arrobas et al., 2017). This represents a significant opportunity for job creation and economic development in the region. However, it should be noted that this process, together with the impacts of climate change on agriculture, could push more people into artisanal and small-scale mining activities (UN ECA, 2018).

- 2.32 **Lithium is a metal of key importance in the energy transition and one that may represent an opportunity for Latin America and the Caribbean.** This metal is instrumental in the production of batteries, and demand for lithium carbonate is expected to double (from 634,000 tons to 1,000,000 tons) between 2025 and 2027 and climb to nearly 1.8 million tons per year by 2030. Demand for lithium hydroxide will also increase. China is the largest consumer of lithium, but its demand for the mineral has fallen during the COVID-19 pandemic, depressing prices and halting the investments needed to supply future demand.³² Within the Lithium Triangle (Argentina, Bolivia, and Chile), there are differences in the quality of the mineral and in the regulatory framework. In Bolivia, private investment has been limited due to the quality of the lithium brine, which contains significant impurities, as well as to the difficulty of doing business in the country. Argentina has attracted major investments over the past decade, with several projects in various stages of progress. The private sector faces few restrictions in terms of legal and environmental requirements because the exploration and exploitation of lithium is unregulated. However, tariffs have fluctuated, and exchange rate measures that restrict direct investment constitute a short-term investment risk in the sector. Chile has the largest reserves, but its legislation restricts participation to State-owned enterprises, companies in partnership with them, or companies with special contracts. This has curtailed development of the reserves, and as of 2020 only two private greenfield projects are active, with concessions that began in the 1970s.³³ ³⁴ Chile remains in the exploration phase, with research and development initiatives that are also financed through contributions from companies that hold concessions to extract lithium and through agreements with these companies for sales within the country to manufacturers or processing facilities that generate value added ([BNamericas, 2020](#)). Mexico, Peru, and Brazil

³¹ Complementarily, growth in demand is also expected due to the increase in production of mobile and electronic devices (Table 2).

³² The decline in investment and production between 2020 and 2022 could lead to market shortages by 2025.

³³ High taxes are threatening the investment climate and generating uncertainty for the mining sector in Chile. The large mining companies pay a corporate income tax of 27% plus a mining tax of between 5% and 14% on operating earnings depending on production rates. With the new profit-sharing rules under consideration in the legislature, mining companies may end up paying as much as 44% in taxes.

³⁴ Environmental permitting has taken from 15 to 24 months.

have also attracted investor interest, and the authorities are evaluating how this resource is managed.

- 2.33 **Against this backdrop of transition, mining companies face challenges in their efforts to develop value chains.** These challenges include sharp price fluctuations, changing market structures with new participants, stricter regulations, a more demanding market, environmental concerns, and heightened uncertainty from 2020 going forward due to the COVID-19 pandemic. Companies are under unprecedented pressure to become more resilient, flexible, and productive, all while remaining competitive ([McKinsey, 2020](#)).

D. Challenge 4. Efficiently manage the public finances in a context of volatile commodity prices and the depletion of resources

- 2.34 **In economies in the region with large extractive industries, government revenue is highly dependent on the sector.** Fiscal revenue from extractive activities was 4.1% of GDP and 14% of total revenue in Latin America and the Caribbean from 2010 to 2018 ([Figure 7](#)), equivalent to 60% of value-added tax revenue. Countries' levels of dependence vary from high (Trinidad and Tobago, Bolivia, Mexico, Suriname, and Ecuador) to medium (mining in Guyana, Chile, and Peru and oil in Colombia) and low (Argentina and Brazil). Falling commodity prices have negatively affected fiscal revenue from the extractive industries in the region. The drop in prices from 2014 to 2015 led to a decline in fiscal revenue of more than three percentage points of GDP between 2015 and 2018. Adding to this were the marked declines in revenue from March 2020 onwards, owing to the impact of the pandemic and plummeting oil prices.

- 2.35 **One of the barriers to the effective management of volatility in Latin America and Caribbean is the procyclical nature of fiscal policy in countries intensive in extractive industries.** Fiscal policy is critical for attenuating economic cycles in the face of volatile commodity prices. Nonetheless, the procyclical nature of current fiscal policy in commodity-exporting countries exacerbates the transmission of volatility to the economy, associated with the connection between commodity prices and public spending. For example, where oil prices increase, public spending rises to an even greater degree (Frankel et al., 2013; IMF, 2015; Villafuerte, López-Murphy, and Ossowski, 2010). This effect has been even more accentuated in these countries during the recent COVID-19 pandemic, which has required higher public spending to handle the emergency and has also reduced fiscal revenue, partly due to weaker commodity prices. On average, spending has increased by 2.4% of GDP in 2020, while debt is expected to rise by 62%, with deficits of around 7% to 9% of GDP (Pineda, Valencia, and Andrian, 2020).

- 2.36 **Due to problems in their design and implementation, fiscal rules have been only partially successful in countries intensive in extractive industries.** Rules that place ceilings on the overall fiscal outturn are highly procyclical as they allow spending to increase during upswings. Rules based on the government balance adjusted for commodity prices tend to be procyclical due to the difficulty of predicting prices and the consequent overestimation of future revenue generated by the extractive industries ([Figure 8](#)). In Chile, Colombia, and Mexico, for example, revenue from the extractive industries is systematically overestimated despite the existence of structural balance rules with hydrocarbon components. Another factor that complicates the implementation of fiscal rules is a lack of well-defined escape clauses; this affects compliance with the rules in the face of

shocks outside the government's control (IMF, 2018). Out of the countries with extractive industries in Latin America and the Caribbean, only Peru and Ecuador have well-defined escape clauses (Ardanaz et al., 2019).

- 2.37 **Countries intensive in extractive industries have made progress toward creating fiscal councils to improve compliance with fiscal targets and also the transparency of the latter.** Fiscal councils improve compliance with the rules and enhance the precision of macroeconomic projections (Beetsma et al., 2018). In countries intensive in extractive industries, councils and committees have been created to provide independent forecasts for commodity prices and thereby avoid a policy bias in favor of increasing expected revenue. Chile (2014), Colombia (2012), and Peru (2015) all have commodity price subcommittees that make up part of the organizational structure of the fiscal councils or committees.
- 2.38 **Sovereign funds in the region have supported countercyclical fiscal policies and curbed currency appreciation problems, but design weaknesses have limited their effectiveness.** Chile's two sovereign funds were the largest in the region in 2018 in terms of the value of their assets (US\$24 billion, or 8% of GDP), but as a proportion of GDP, Trinidad and Tobago's fund was the largest (27% of GDP) (Table 7). There are weaknesses in the design of some of these funds (Barreix and Corrales, 2019). In Chile, the Economic and Social Stabilization Fund lacks numerical funding and withdrawal rules and may finance deficits at the discretion of the Ministry of Finance (Cerdeira and Larraín, 2019). In Mexico, the Mexican Oil Fund receives oil revenue and makes discretionary transfers to the budget (Revilla, 2019). Other countries, such as Trinidad and Tobago (and Ecuador in the past), have funds with rigid funding and withdrawal rules that force the authorities to accumulate resources in them while the budget is simultaneously financed by debt at higher interest rates (IMF, 2015).
- 2.39 **The use of financial hedging tools is limited in the region.** These serve to reduce the exposure of the fiscal accounts to volatility in commodity prices, but are generally not used due to: (i) a lack of consensus regarding how to handle these types of risks; (ii) limited access and a lack of relationships with potential counterparts in the market; (iii) limited ability to pay the associated costs; and (iv) a lack of internal capacity and access to best practices. In the region, only Mexico has implemented a sovereign oil hedging program and has used it constantly since 2001. Some Latin American and Caribbean countries are seeking similar coverage. Colombia, for example, amended its legal framework to allow the government to execute these types of financial transactions, removing also the liability of public officials when these types of operations are undertaken ([Reuters, 2018](#)). The countries in the region that have been involved in oil hedging at some point are the Dominican Republic, Jamaica, Ecuador, Panama, Colombia, and Uruguay.
- 2.40 **The migration toward more progressive fiscal instruments in the extractive industries is a challenge for Latin American and Caribbean countries.** Progressive taxes (i.e. taxes on income, profits from natural resources, and excess profits) are more effective than royalties in capturing profits from increased prices for natural resources.³⁵ Despite this, the region has made extensive use of

³⁵ For more information on the different taxes, see Annex III.

royalties, which in their most simple forms (ad quantum and ad valorem)³⁶ require little monitoring (Manzano et al., 2017). Royalties account for 16% of tax revenue in the region (2.3% of GDP), compared with 0.9% in the OECD countries (0.2% of GDP).³⁷ The figures for Ecuador and Colombia are 21% and 17% of tax revenue, respectively. Countries have modified royalty arrangements to capture a greater share of earnings in the extractive sector, but this has led to more complex regimes.³⁸ The use of progressive taxes requires specialized knowledge of the sector (IMF, 2012). Accordingly, Latin American and Caribbean countries must develop institutional capacities to overcome gaps in both tax administration and sector operations and knowledge. For instance, more units specializing in the extractive industries are required in the region's tax administrations, and information technologies need to be strengthened to collect, cross-reference, and process information.

E. Challenge 5. Strengthen transparency and integrity and prevent corruption in the management of the extractive industries

2.41 The extractive industries are particularly exposed to acts of corruption. Out of 427 international bribery cases, 19% of sanctioned cases were associated with the extractive industries (OECD, 2015). The hydrocarbons sector is perceived to be one of those most susceptible to corruption (Hardoon and Heinrich, 2011; Ernst & Young, 2014), and the extractive sector is particularly vulnerable as regards the allocation of rights, revenue collection, and the management of State-owned companies (Fiscal Monitor, 2019). The exploitation of extractive resources in developing countries is associated with cases of corruption and State capture by elites, linked to the enormous profits from oil and minerals. Greater transparency and integrity are key to solving this problem, through information dissemination and accountability mechanisms such as audits or control entities (IDB, 2020; Engel et al., 2018; Dassen et al., 2012). This section analyzes the challenges in Latin America and the Caribbean in terms of the transparency and integrity of extractive industries.

2.42 There is a persistent risk of corruption across the entire extractive industry value chain in Latin America and the Caribbean. This risk is characterized by: (i) underestimation of environmental impacts or overestimation of economic benefits, opacity of land ownership, and the impact on community decision-making; (ii) asymmetries in information and technical capacity that affect bids and/or the allocation of licenses; (iii) a lack of supervision and compliance with extraction and production laws; (iv) inefficient, discretionary tax regimes and a lack of government capacity and experience; and (v) government weaknesses in the management of revenue, expenditure, and investments and a lack of coordination between local and central governments (Eisen et al., 2020). Several countries in the region have joined international transparency initiatives (Table 8). Despite this,

³⁶ Ad quantum royalties are levied based on gross production volume, while ad valorem royalties are levied on gross production value (based on benchmark prices).

³⁷ Authors' estimates based on World Bank data.

³⁸ Colombia, Ecuador, Mexico, and Peru have designed royalty systems with sliding scales that vary depending on gross production, the value of production, operating profits, and prices. These types of royalties have improved progressivity but are more complex to administer.

the Resource Governance Index (Natural Resource Governance Institute, 2017)³⁹ indicates that there are still challenges in managing revenue flows and in generating value from extraction (Table 9). There are also persistent perceptions of corruption in the sector. Regional surveys in 2019 showed that citizens consider levels of corruption in government to have increased,⁴⁰ and recent corruption scandals associated with the extractive industries have intensified this perception.⁴¹

- 2.43 **The extractive industries warrant special treatment in transparency laws in Latin American and Caribbean countries.** More than half of the countries in the region have transparency laws based on access to information (Ballón et al., 2017). Obligations have been imposed in the area of access to information by the free trade agreements signed with the United States by Peru (2006-2009) and Colombia (2006-2012), as well as the accession of Chile (2010) and Colombia (2020) to the OECD. Transparency in relation to contracts and the fiscal accounts has improved, and many countries have joined international transparency initiatives such as the Extractive Industries Transparency Initiative (EITI)⁴² and the Open Government Partnership (OGP)⁴³ (Ballón et al., 2017). However, only a few countries in the region have included sections dedicated to the extractive industries in their transparency laws. In Guatemala, the Public Information Access Act stipulates that private extractive companies must provide public information. In Mexico, the Federal Transparency and Public Information Access Act includes additional obligations relating to hydrocarbons and mining. Lastly, in Peru, the Transparency and Access to Public Information Act has led to progress in access to information regarding mining and hydrocarbons production, fiscal revenue, the distribution of extractive revenues, public spending, investments, and social spending (De la Fuente and Olivera, 2017).
- 2.44 **The region also needs to make further progress with respect to improving beneficial ownership transparency.** Beneficial owners are those who obtain the ultimate economic benefit behind the intermediaries used to conceal their real identity. Since 2013, EITI member countries such as Colombia, Honduras, Peru, the Dominican Republic, and Trinidad and Tobago have published work plans for publishing data on final beneficiaries. The EITI has also published information to provide guidance and support to countries in disclosing beneficial owners. However, the definition of a beneficial owner varies internationally and between different national jurisdictions, complicating the harmonization of regulation in the region (Knobel, 2017). For example, there are different definitions of beneficial owners depending on the percentage of a company owned, from 5% in Colombia to 10% in Barbados, the Bahamas, and Belize and 20% in Argentina (de Michele

³⁹ The Resource Governance Index (RGI)—published by the Natural Resource Governance Institute (NRGI) in June 2017—assessed countries with extractive activities. The scores are measurements of legal frameworks and practices in the area of transparency and accountability policies (in both the extraction stage and the subsequent management of revenue from the sale of output).

⁴⁰ Global Corruption Barometer: Latin America and the Caribbean 2019.

⁴¹ Petrobras in Brazil, PEMEX in Mexico, the Southern Gas Pipeline in Peru, and the Panama Papers.

⁴² The EITI is a global standard for promoting transparency in extractive sector payments and revenues through accountability in public life, government operations, and business in the sector.

⁴³ The Open Government Partnership is a multilateral initiative that aims to secure concrete commitments from national and subnational governments to promote open government.

and Barreix, 2019). Understanding national and local legislation and government capacity is critical to ensuring the effective implementation of data openness. For example, in an EITI pilot project in [Honduras](#), exemptions written into the legislation represented a challenge to exhaustive disclosure. Confidentiality provisions in the national legislation in Trinidad and Tobago also impeded the effective information of the EITI standard, though these were remedied with specialized technical support (Vieyra et al., 2019).

- 2.45 **Barriers to access hinder accountability and compliance with the legislation.** Information on the contracts, debt, and finances of the extractive industries is scant, and access is limited. In addition, information is frequently simply not provided, is provided late, and/or is of low quality. The authorities also use legal exemptions to obstruct access to information, and improving the response to citizen requests for information will be challenging (Kaufmann et al., 2019; NRGI, 2017).
- 2.46 **There are information gaps in the processes for granting rights and licenses.** Latin American and Caribbean countries generally publish information on hydrocarbon reserves,⁴⁴ but information on mining is scant. Some countries have made headway in building registers of mining concessions and oil fields, but there are challenges in relation to their availability to the public and information on coordinates and licensees. Before licenses are awarded, there are difficulties in divulging the requirements and the methods for allocating licenses. Thereafter, there is still a need for further disclosure of the financial participation of public officials and extractive companies, as well as more extensive publication of the licenses and contracts signed.⁴⁵
- 2.47 **There are bureaucratic hurdles to accessing concession contracts.** Access to exploration and exploitation contracts in the hydrocarbons and mining sectors involve lengthy and complex administrative processes, and the results of exploration campaigns are not usually available to the public (Sanchez et al., 2017; Toledo and Liberona, 2017). Nonetheless, there are successful cases, such as Peru's Geological and Mining Cadastre System (GEOCATMIN) and the websites for the National Hydrocarbons Agency (ANH) and the National Mining Agency (ANM) in Colombia (Velásquez et al., 2017). Progress has also been made in creating digital platforms such as MapaRegalías in Colombia, the Argentine Mining Information Center (CIMA) in Argentina, and MapaInversiones Perú País Minero in Peru.⁴⁶
- 2.48 **In many countries in the region, fiscal information on revenue from the extractive industries is poor.** In general, governments voluntarily publish information on fiscal revenue from the extractive industries, although in most cases this is only at an aggregate level. In some cases, the information is not published in the budget or in official fiscal reports. In countries where revenues are published, a lack of supporting information makes it difficult to discern the coverage and

⁴⁴ An exception to this is Trinidad and Tobago, which prior to 2018 did not publish any estimates of gas and oil reserves.

⁴⁵ Authors' calculations based on 2017 RGI.

⁴⁶ For more details of these digital platforms, see Section IV.

composition of the aggregate revenue figures published and the methodologies used.

- 2.49 **Tax confidentiality is a legal barrier to greater transparency and integrity in the extractive industries.** In most countries in the region, the tax authorities must preserve confidentiality with respect to mining and oil companies' tax returns. This hinders the accountability process and the monitoring of resources from the extractive industries (de la Fuente, 2014; Velázquez et al., 2017; Sanchez et al., 2017; Toledo and Liberona, 2017).
- 2.50 **The auditing of public funds derived from the extractive industries needs to be improved.** There is a need to improve the auditing of transfers to subnational governments. Up-to-date figures are usually published regularly in five of the seven countries that have subnational transfers, including the amount of revenue transferred by source of income.⁴⁷ Nonetheless, although auditing of these transfers is normally required, said audits are often not performed or are out of date.⁴⁸ There is also a need to strengthen external audits of sovereign funds. Many of the sovereign funds in the region have numerical rules for funding and withdrawals that governments adhere to. These dictate the quantity of deposits and withdrawals, as specified in national budgets.⁴⁹ In most countries, however, there are no laws governing the funds' investment policies.⁵⁰ In addition, greater emphasis should be placed on annual external audits and executive branch supervision of the funds' financial reports.⁵¹ The regular reports and audited financial statements of the sovereign funds in Chile, Mexico, and Trinidad and Tobago are good examples of the provision of public information.
- 2.51 **The separation of functions between NRCs and governments has yielded positive results, but problems of corruption remain.** Significant progress has been made in the disclosure of transfers from NRCs to the government and vice versa, as well as in financial reports, the disclosure of production, joint ventures and subsidiary companies, and the implementation of corporate governance in the NRCs (Vieyra et al., 2019). Nonetheless, some countries in the region still allow their NRCs to engage in noncommercial activities⁵² that pose challenges for efficiency, management, and supervision (Ter-Minassian, 2017; Tordo et al., 2010; Hartley and Medlock, 2013). At the same time, the wave of corruption scandals linked to national oil companies has affected almost all countries in the region ([Box 1](#)). This has revealed failings in corporate controls and problems in sector institutions, including weak rule of law, political interference in State-owned enterprises, and low accountability.⁵³ In response, Brazil, Colombia, and Mexico have created governance systems that include autonomous technical agencies

⁴⁷ In the few countries that do not follow good practices, information is outdated, and the amount of revenue transferred by source is not disclosed.

⁴⁸ Authors' calculations based on the 2017 RGI.

⁴⁹ Chile's Economic and Social Stabilization Fund is an exception.

⁵⁰ Investment strategies should include limits on asset concentration and risk and should ideally be approved by the legislature. Corporate governance should be responsible for investment decisions, and funds should therefore have operational independence in their asset management activities.

⁵¹ Authors' calculations based on the 2017 RGI.

⁵² These include payments for social services, public infrastructure, fuel subsidies, and national debt service.

⁵³ Transparency and Integrity Sector Framework Document (GN-2981-2).

responsible for administering access to hydrocarbon reserves through international auctions based on open competition (Musacchio and Pineda 2019; Vieyra et al., 2019).

- 2.52 **There is significant room for improvement in terms of information on artisanal and small-scale mining.** Artisanal and small-scale mining is largely an informal sector for which there is only limited information available about production, income, operations, and location of activities. This makes it hard to estimate its actual contribution to national economies. The EITI has only recently started to incorporate this sector into its Standard, and of its 10 current member countries from Latin America and the Caribbean, only Colombia has begun to look into the possibility of including information on small-scale artisanal mining in its reports (EITI, 2018).

III. INTERNATIONAL EVIDENCE AND BEST PRACTICES RELATING TO THE EFFECTIVENESS OF PROGRAMS FOR EXTRACTIVE INDUSTRY POLICY AND MANAGEMENT

- 3.1 **There is extensive international evidence regarding best practices in the institutional development of extractive industries.** There is an extensive and detailed literature addressing key aspects of the development of the extractive industries throughout the entire value chain, as well as their effects on the economy (Manzano, 2014). Of particular note is the work by Addison and Roe (2018) and Cameron and Stanley (2017) on political economy, the institutions that regulate the extractive industries, and governance of these sectors, as well as that of Bulte et al. (2005) and Isham et al. (2005), who have studied the impact of income from the extractive industries on economic growth. At the same time, countries such as Norway, the United Kingdom, Canada, and Australia have all successfully developed their extractive industries. This section analyzes international best practices in relation to the extractive industries as a means of addressing the regional challenges described in the previous section.
- A. **Institutional and governance framework that fosters economically, environmentally, and socially sustainable development based on principles of economic efficiency and productivity in the extractive industries**
- 3.2 **Appropriate institutional frameworks are correlated with improved performance by the extractive industries.** In Australia and the United States, the institutional framework, access to human capital, and the development of educational programs were key for the effective development of the extractive industries (Wright and Czelusta, 2002; Maloney, 2002). There is also a positive correlation between the quality of the regulatory framework and mining performance (Djankov et al., 2006). Australia, the United States, and the Scandinavian countries have demonstrated synergies between the extractive industries and other sectors of the economy (Lederman and Maloney, 2007; Balza and Manzano, 2013; Manzano, 2014). Good governance has also reduced the negative impact on the economy, the environment, and communities in Australia, Botswana, Canada, and Norway (Florini, 2007; Kaufmann et al., 2009; Søreide, 2012).
- 3.3 **Institutional frameworks in countries with highly developed extractive industries exhibit a number of key features.** In Norway, the United Kingdom,

Canada, Australia, and South Africa, the ownership of subsurface resources and responsibility for their management is clearly established, either through the Constitution (Australia and Canada) or through oil, gas, or mining legislation (Norway, the United Kingdom, and South Africa). These laws provide a detailed description of (i) the institutional structure and functions of government bodies; (ii) the allocation of rights and titles; (iii) the fiscal regime; (iv) labor, industrial safety, health, environmental, and social standards; and (v) accountability arrangements (Baker McKenzie, 2017; Local Legal Group, 2018; Deloitte, 2014).

- 3.4 **Institutional roles, responsibilities, and mandates should be clearly defined to facilitate coordination.** Coordination between ministries and agencies is key for effective management (Calder, 2014; Lemgruber and Shelton, 2014). Norway is an outstanding example of the coordination of multiple stakeholders. This has been essential for allocating the functions of policy design, the legal framework, ownership of resources, regulation, supervision, and tax collection to different agencies. Its success has also been a result of the technical knowledge, experience, financial resources, and coordination of its government agencies (Cameron and Stanley, 2017; Halland et al., 2014; Al-Kasim, 2006). In Canada and Australia, there is also strong coordination between regulatory frameworks at the central and provincial government levels; this allows subnational governments to exercise sovereignty over the resources in their territory, directly control the effects of extractive activity, and capture revenue directly (Baker Mckensie, 2017).
- 3.5 **Defining clear obligations for artisanal and small-scale mining titles and establishing effective coordination between institutional bodies are key steps taken by countries that have achieved successful regulation of this activity.** The experience of countries like Zambia points up the importance of offering regulatory guarantees to remove barriers to formalization, such as: (i) guarantees of ownership rights for artisanal miners; (ii) specific procedures for awarding artisanal and small-scale mining permits; (iii) a specific regulatory regime for this type of activity; (iv) measures for providing technical and financial support for artisanal miners to apply for titles; and (v) special provisions for the commercialization of products (IGF, 2017; de Sa and Espinasa, 2018). The experience of countries such as Algeria, Zambia, and Mozambique reveals the benefits of establishing a mining cadastral system to improve the efficiency of permitting systems. In addition, countries like Madagascar and Mozambique have set up modern cadastral systems based on technology and use of the Internet and have achieved greater levels of coordination between government agencies, as well as between the central and decentralized offices that administer the mining cadastre (Ortega et al., 2009).
- 3.6 **The OECD countries use a system of concessions to award rights.** Norway, the United Kingdom, Australia, Canada, and South Africa use an easily administered concessions-based model that awards resource exploration, exploitation, and processing rights in the form of licenses and permits (Cameron and Stanley, 2017; Stanley and Mikhaylova, 2011; Duval et al., 2009; Radon, 2005). However, concessions require legal frameworks that safeguard property systems, as well as legal stability and good information about resources (Annex V).
- 3.7 **Many developing countries use production sharing contracts (PSCs) in the hydrocarbons sector.** In these contracts, the State awards the right to participate in the activity and also partial property rights in relation to the resources extracted

(Table 10). In general, the private company assumes all costs and risks associated with the operation and is obliged to pay royalties and taxes (Johnston, 1994). The adoption of PSCs has enabled State control of production in developing countries without discouraging investment (Tordo, 2010). In addition, partnerships between State-owned and private companies facilitate the transfer of knowledge that is usually limited in the case of State-owned companies (Nutavoot, 2004).

- 3.8 **Mine-to-market optimization can generate increased earnings.** Optimization can generate an increase of between 10% and 15% in earnings before interest, taxes, depreciation, and amortization by optimizing returns, product margins, and operating costs. Improving mine-to-market performance is based on two factors: (i) organizational optimization (restructured business units, multifunctional teams, employee training); and (ii) data and technology architecture (capturing, tracking, and cleaning operational data along the entire value chain, information systems, and analytical models to support decision-making) ([McKinsey, 2020](#)).
- 3.9 **There are different approaches to designing legal frameworks that facilitate effective contract negotiations.** Under the integrated approach, the regulations necessary for sector operations are predetermined (i.e. Australia, Canada, Norway, the United States, and some Latin American and Caribbean countries). This institutional framework ensures equal treatment, reduces negotiation processes, limits arbitrary actions, and prevents corruption. In the second approach, legal provisions are covered in individual agreements negotiated by the government with investors, which are then approved by the legislature.⁵⁴ This system offers flexibility in negotiations with investors, although it is vulnerable to corruption and can create a multiplicity of legal and fiscal regimes. The hybrid approach combines elements of the aforementioned approaches and includes a short framework law that covers key concepts but leaves space for additional elements in individual regulations and contracts.
- 3.10 **Norway is an example of a country with competitive natural resource companies (NRCs) that are attractive to investors.** The country has two State-owned companies for gas and oil (Gassco and Petoro AS, which are 100% State-owned) and a mixed-ownership company (Equinor ASA, 67% State-owned). The government participates in sector activity as a licensee on equal footing with others through the State's Direct Financial Interest (managed by Petoro AS), and through joint ventures, in which it shares the same rights and responsibilities as its partner companies. The regulatory framework has thus succeeded in reconciling the presence of numerous State-owned companies with mechanisms to encourage foreign investment and promote competition and improved performance by its State-owned companies (Al-Kasim 2006).
- B. The impact of extractive industries on socioenvironmental sustainability, the creation of opportunities for all, and economic diversification**
- 3.11 **Assessment of the socioenvironmental risks of the extractive industries should involve a strategic, cumulative approach to identifying and managing impacts at the local and regional level.** The Performance Standards developed by the International Finance Corporation (IFC) are an international benchmark for

⁵⁴ To facilitate the negotiation process and strengthen transparency, standard contracts are often used that limit the number of variables that can be negotiated.

identifying and managing socioenvironmental risk and have been adopted by many organizations. The European Union countries have strict laws and regulations aimed at protecting the ground, water, air, critical habitats, biodiversity, and the rights of indigenous and local peoples, as well as requirements for closing and restoring sites. There are also waste management policies for the extractive industries, which incorporate aspects like recycling and reuse of tailings, water, and waste rock generated by extractive processes (European Commission, Joint Research Centre, 2018). The process of social licensing is also key for ensuring socioenvironmentally sustainable activities. It is internationally acknowledged that socioenvironmental impact evaluations based only on a project-by-project approach neglect the strategic, cumulative effects that arise from the existence of several projects in the same territory. Good practices in the sector therefore include the strategic evaluation of development aspects and cumulative effects on the countries' regulatory frameworks as a requirement for obtaining environmental licenses.

- 3.12 **To solve problems of violence against women and human rights defenders and eliminate child labor, a coordinated response will be required that involves the interested parties.** Such efforts should incorporate the good practices that have been identified,⁵⁵ which include the need to create spaces for victims of domestic and gender-based violence to report incidents and receive counseling, support, and shelter; education and awareness building regarding gender-based violence for communities, companies, and local authorities; development of codes of conduct for all employees in the extractive industries, together with mechanisms for their execution and the implementation of sanctions for noncompliance; and education for the police and the judicial branch regarding legislation in the area of gender-based violence.
- 3.13 **In artisanal and small-scale mining, efforts are needed to promote the regularization of miners and strengthen socioenvironmental management mechanisms.** Policies for the formalization of artisanal and small-scale mining should include the simplification of permitting processes and should be complemented by programs giving access to financing and fair trade certification based on compliance with environmental and labor standards (IISD, 2017). It is also important to update mining cadastres and differentiate areas for small- and large-scale operations, as well as for their possible synergies (IISD, 2017). In addition, gender equity measures should be incorporated into sector policies and diagnostic assessments (Arcos Alonso and Rivera Guzmán, 2018). Concerning child labor, the International Programme on the Elimination of Child Labour has undertaken technical cooperation projects to demonstrate how child labor can be eliminated in small-scale mining operations (ILO, 2019), the recommendations of which should be taken into account.
- 3.14 **Early action to build awareness and secure the active and permanent involvement of local stakeholders strengthens extractive projects and reduces conflicts and negative impacts.** The probability of violent conflict increases where local communities have been excluded from decision-making processes, economic benefits are concentrated in a few hands, or project impacts

⁵⁵ See IFC (2018), Tool Suite 4: Addressing gender-based violence in the workforce; Barcia, 2017; Oxfam, 2017.

clash with local social, cultural, religious, and environmental norms or align with existing tensions (United Nations and European Union, 2012). It is therefore crucial that five levels of relationships be considered—information, dialogue, consultation, cooperation, and partnerships—and that time be invested in understanding the reality of vulnerable populations and identifying lessons learned at the local, national, and international levels (Milano, 2018). In the case of indigenous peoples, these mechanisms should include permanent processes of dialogue, consultation, and consensus-building that are culturally adapted to the decision-making processes of these peoples and ensure that standards of free, prior, and informed consent (FPIC) for indigenous peoples are met. It is important that these actions be implemented throughout the entire extractive industry value chain, starting at the pre-exploration stage.

- 3.15 Local institutions and capacities need to be strengthened for the design of social investments that facilitate community participation and generate “shared value” for all interested parties.**⁵⁶ This process requires that the local population be included in extractive industry value chains and receive benefits from these activities.⁵⁷ In addition, the meaningful participation, ownership, and empowerment of communities is important in the projects if investments are to be sustainable in the long term. To improve social investment outcomes, these investments must be strategic, aligned with community priorities and the life plans of indigenous populations, linked to business objectives, and include the participation of a variety of stakeholders; they also need to be sustainable, measurable, and communicable (IFC, 2010; Arbeláez and Parra, 2020). Formal agreements, such as benefit distribution agreements, are one instrument used to establish both expectations among the parties and the accepted terms of participation in a project. These are negotiated between companies, state or provincial governments, local leaders, and indigenous peoples,⁵⁸ and often include cooperation commitments to develop capacities in indigenous communities (World Bank, 2012).⁵⁹ On this point, it is also important to create mechanisms for empowering women to ensure their active participation in projects ([Box 9](#)). As a complement to this, there is a need to strengthen government capacity to integrate gender equality and diversity into sector policies and programming.
- 3.16 Some countries have succeeded in strengthening their institutions to take advantage of resources from extractive industries and foster the development of other sectors.** In Norway, high levels of education, political stability, and sound institutions have helped to multiply the benefits flowing from the country's extractive industries (Havro and Santiso, 2008). In addition, the

⁵⁶ Shared value is understood as the realization of mutual benefits and new value for all stakeholders, with “value” encompassing financial, economic, social, cultural, and environmental dimensions (OECD, 2016).

⁵⁷ In the case of indigenous peoples, ILO Convention 169, Article 15, highlights “the right of these peoples to participate in the use, management and conservation” of natural resources pertaining to their lands, adding that “in cases in which the State retains the ownership of mineral or sub-surface resources [...] the peoples concerned shall wherever possible participate in the benefits of such activities.”

⁵⁸ For example, the benefit distribution agreement between Albemarle and the Atacama Peoples' Council in Chile.

⁵⁹ Efforts should be made to involve groups from all of the interested parties (including women and representatives of vulnerable and marginalized groups). It may be necessary to consult certain groups independently; in some communities, for example, specific consultations may be required for women if they do not feel comfortable speaking up in mixed-gender meetings.

country has focused on developing sectors with existing capacities that can be used in production chains linked to the extractive industry, such as oil platform construction, technical services, and shipping (Halland et al., 2016). Lastly, the macroeconomic and fiscal vulnerabilities created by variations in commodity prices have also been reduced by the Government Pension Fund of Norway, into which surplus wealth from the extractive sector is deposited.

- 3.17 **Local content policies can be a tool for leveraging the benefits of extractive industries, fostering innovation processes and the creation of production chains.** Evidence regarding the effectiveness of these policies is unclear, however, partly because the host countries do not always have the inputs, capacities, skills, and compatible technologies required by these industries (Arbeláez and Parra, 2020, Navas-Aleman and Bazan, 2020). In Latin America and the Caribbean, most countries have measures aimed at improving the participation of national industry and creation of local employment in the extractive industries (Herrera et al., 2016). In some cases, such as Brazil, provisions are included to foster knowledge transfer from the sector through the mandatory provision of resources for research and development in local institutions (OECD, 2017). In the mining sector, spaces for collaboration between universities and suppliers in the sector (especially small ones) are important in driving innovation processes (Navas-Aleman and Bazan, 2020; Marin et al., 2020), while support for collaborative platforms between local companies can help the latter to achieve the scale and capacity necessary to enter international markets (Bamber and Fernandez-Stark, 2020).⁶⁰
- 3.18 **To be effective, actions to improve human capital and public infrastructure at the national and local levels should be accompanied by institutional strengthening measures.** Actions to build human capital frequently include increased spending on education and health, as well as direct transfers to households.⁶¹ In the case of infrastructure investment, this can have a significant multiplier effect (Izquierdo et al., 2018), with the potential to create employment and improve productivity, thus supporting economic growth and diversification.⁶² In addition, the development and implementation of methodologies to achieve greater integration of the sector into the productive fabric has particular requirements in terms of trained human resources and sound local institutions. Efforts to support the strengthening of subnational capacities need to be sustained over time and accompanied by improvements in the quality of institutions and efficiency of public service delivery. Training for professionals and local officials must be accompanied by sustained improvements in institutions (regulatory framework, financing mechanisms, accountability, etc.), as the ability to retain talent is usually limited in local entities.

⁶⁰ One such example is AustMine, an association that has been in operation for more than 30 years and represents more than 500 Australian companies in the mining sector.

⁶¹ An example of this is the Alaska Permanent Fund, but other arrangements can also be used for this purpose, such as conditional cash transfers, which have proven to be effective tools.

⁶² Given that infrastructure gaps and limited State presence in extraction zones have a negative impact on the extractive industries, it is important to have integrated, multisector public investment plans that support development of the sector.

- 3.19 **It is important to have clear and transparent mechanisms for distributing resources from the extractive industries among the central and subnational levels of government.** Poorly designed distribution arrangements exacerbate problems of inequality, corruption, and social conflict. The NRGI and the United Nations Development Programme (UNDP, 2016) provide recommendations for the design of fair and stable revenue distribution systems. Equalization transfers have been a successful policy for reducing regional inequalities and limiting the risk of conflict. Most OECD countries have these types of transfers (averaging 50% of total transfers), and they have a significant impact in terms of reducing subnational fiscal inequality (Muñoz et al., 2017; Blöchliger, 2013). Lastly, it is important that these instruments be integrated into a framework of fiscal responsibility and sustainability for local governments (Muñoz et al., 2017; Pineda et al., 2018).

C. Good practices in managing risks from the transition to low-carbon economies

- 3.20 **Developed countries have begun to take steps to reduce CO₂ emissions from the use of fossil fuels and begin the process of transition to clean energies.** A total of 33 countries and 27 subnational governments have joined the [Powering Past Coal Alliance](#), which aims to phase out the use of coal in power generation.⁶³ One of the members, Germany, has announced plans to eliminate the use of coal by 2038, including the allocation of US\$45 billion to a compensation fund that will assist in the closure of lignite mines and power plants that use this fossil fuel, as well as financing new infrastructure projects in the affected areas and providing training to sector workers so that they can find new employment opportunities.⁶⁴ The United Kingdom, which in 2015 was the first country to announce that it would eliminate the use of coal in power generation, also has an implementation plan that includes financial support for the industry (through a surcharge on electricity bills during the transition period). France, Canada, Ireland, and Denmark have announced similar plans to phase out their use of coal in power generation.
- 3.21 **Awareness has grown in recent years of the need to tackle the risk of stranded assets in the extractive industries at an early stage.** If the targets for emissions reductions in the Paris Agreement are met, the global value of stranded assets associated with projects that have not yet recovered their initial investment is projected to be US\$304 billion in 2035, US\$180 billion of which correspond to the oil and gas industries and US\$4 billion to the coal industry (Fischer and Baron, 2015). State oil and gas companies are likely to be among those most affected (Mitchel et al., 2015). In addition to this, the cost of stranded assets in the power generation industry is projected at US\$50 billion (Climate Policy Initiative, 2014). To avoid a greater number of stranded assets, the extractive industries need to evaluate these risks. Delays in the implementation of decarbonization actions may

⁶³ In Latin America and the Caribbean, only Costa Rica, El Salvador, and Mexico are members of this alliance.

⁶⁴ [World Economic Forum, 2020](#).

increase stranded asset levels, as it will be impossible for the extractive industries to adjust to changes in fossil fuel demand in a timely manner (IRENA, 2017).⁶⁵

- 3.22 **A number of developed countries have prioritized research into low-emission technologies as part of the process of aligning their mining, energy, and climate plans and green growth agendas.** In Norway, consultations have taken place with the private sector and other stakeholders, providing key inputs into the process of finding new diversification opportunities within the framework of a green economy.⁶⁶ Canada plans to develop new clean energy generation technologies with a view to reducing its carbon footprint and helping its industries to leverage growth opportunities in this sector.⁶⁷ The United Kingdom has allocated funds for the development of new hydrogen production and utilization technologies, an area in which the country hopes to gain a comparative advantage.⁶⁸
- 3.23 **The elimination of fossil fuel subsidies will continue to be an important policy for reducing greenhouse gas emissions.** In 2009, the Group of Twenty (G20) announced their commitment to gradually eliminate fossil fuel subsidies (Pittsburgh Summit, 2009, G20 Leaders Statement). Implementation, however, has been difficult (OECD/IEA, 2019). Total worldwide fossil fuel subsidies stood at US\$4.7 trillion in 2015 and were projected at US\$5.2 trillion for 2017. Oil and coal subsidies accounted for 85% of this total (IMF, 2019). In addition, 75% of subsidies stemmed from countries' domestic policies, meaning that streamlining them will reduce greenhouse gas emissions and yield fiscal savings. Reforms to establish efficient prices for fossil fuels are projected to reduce annual carbon emissions by as much as 28%, with government revenue increasing by around 3.8% of GDP (IMF, 2019).
- 3.24 **The opportunities that the energy transition will create for the mining industry must be accompanied by improved social and environmental management of the sector.** The projected increase in demand for minerals represents an opportunity for job creation and stronger growth in the mining sector, but also a challenge in terms of managing the negative socioenvironmental effects of the industry (IISD, 2019; Hund et al., 2020). Initiatives such as the Climate-Smart Mining Initiative seek to assist countries in solving this problem, for example by improving the energy efficiency and waste management in the sector. In the case of artisanal and small-scale mining, socioenvironmental management policies should be supplemented with rural development and agricultural diversification actions in order to reduce the incentives for labor to migrate to the sector (IISD, 2017).

⁶⁵ The IDB Group is working on an active decarbonization agenda to retire stranded assets, such as coal plants, and replace them with renewable energy projects, monetizing the avoided CO₂ emissions as part of the financial plan for this type of investment. The first project that will apply this innovation in financial structuring is with Engie Chile.

⁶⁶ [Green Competitiveness, 2016.](#)

⁶⁷ [Canada's Energy Transition. Getting to Our Energy Future, Together.](#)

⁶⁸ [World Energy Trade, 2020.](#)

D. The role of fiscal policy in management of the extractive industries

- 3.25 Countries intensive in extractive industries have developed fiscal institutions to address the challenges associated with resources from the sector.** Some countries, such as Norway, have converted their wealth of extractable resources into infrastructure, human capital, and financial assets for future generations. In other countries, in contrast, fiscal policy based on revenue from the extractive industries has been procyclical, with harmful effects upon private investment and long-term growth. The procyclical nature of spending is accentuated in economies with weak institutions. The literature suggests that this is a result of competition between interest groups for resources from the extractive industries, which increases inefficient expenditure (Tornell and Lane, 1999). Another theory suggests that voters do not trust corrupt governments with large amounts of resources from the extractive industries and instead demand deficits out of a concern that these resources will be spent inefficiently (Alesina et al., 2008). In this sense, incumbent governments may fail to save so that the amount of funding available to a future bad government is reduced (Collier and Hoeffler, 2009). To address these challenges, countries have designed fiscal rules, fiscal councils, and sovereign funds (Ossowski and Halland, 2016).
- 3.26 The performance of some fiscal rules in countries with extractive industries has been affected by problems in design and government financial administration.** There are challenges in both the design of fiscal rules and their use to manage the uncertainties surrounding commodity-based revenue (Ossowski and Halland, 2016). Political economy and governance frictions also reduce the rules' effectiveness. In Chad, for example, the rule targeted expenditure, yet the country had multiple budgets and specific revenue allocations. In light of this, a new public finance law helped to improve the management of expenditure and financial information (IMF, 2007b; Dabán and Héris, 2010).
- 3.27 Good practices suggest that rules should be adopted that treat the extractive industries as a separate component within the fiscal accounts.** These include rules that target primary balances excluding revenue from the extractive industries, with correction mechanisms that help to anchor the debt. Other options are rules that limit growth in spending or the level of debt. The objective is to decouple the impact of commodity price volatility from fiscal policies and, with the help of the rules, resist pressures to increase spending, particularly during economic upswings (Ossowski and Halland, 2016).
- 3.28 Fiscal councils strengthen compliance with fiscal rules in countries with extractive industries.** These are usually permanent executive or legislative branch agencies with responsibilities such as the impartial scrutiny of fiscal plans and fiscal policy performance (Hemming, 2013a). In the case of countries rich in natural resources, councils should have members with skills and experience in managing natural resource revenues (Hemming, 2013b). International examples include the National Monitoring Committee for Hydrocarbon Revenue in Mauritania, the Petroleum Fund Consultative Council in Timor-Leste, the Oil Revenue Monitoring and Oversight Committee in Chad, and the Oil Supervisory Commission in São Tomé and Príncipe.
- 3.29 The poor design and implementation of sovereign funds can aggravate fiscal problems.** The main failing is a lack of consistency with fiscal plans. In Chad and Papua New Guinea, funds were abandoned due to problems of coordination with

fiscal policies. In Azerbaijan, Kazakhstan, and Libya, funds were ultimately used to finance extrabudgetary expenditure, creating a disconnect with fiscal plans and a loss of control over spending. Ghana's experience led to an accumulation of assets in the fund while public debt simultaneously underwent a substantial increase due to fiscal deficits and the need to finance deposits into the fund, with fiscal costs.

- 3.30 **Financial hedging is important for cushioning the impact of fluctuations in the oil price.** For countries that are net oil exporters, the negative consequences of a reduction in prices are compounded by the increase in sovereign debt costs. Hedging reduces revenue volatility and can potentially reduce risk premiums on sovereign debt if creditors are prepared to offer more favorable loan terms because they see that hedging has transferred part of the oil price risk elsewhere. Accordingly, although initial outlays for hedging contracts make the fiscal costs of mitigating exposure to commodity price risks explicit, a lack of such coverage could be much more costly for countries (Ma and Valencia, 2018).
- 3.31 **Fiscal regimes for the extractive industries should be progressive and should maximize tax collection without discouraging private investment.** The share of extractive industry rents that governments capture is known as the “government take.” The government take should strike a balance between maximizing revenue and minimizing distortions in sector activity.⁶⁹ Except in the developed countries and Central Asia, there is a large dispersion of government take across the Middle East and North Africa regions ([Figure 9](#)). An acceptable range for government take in the mining sector is between 40% and 60% of rents, while in the case of hydrocarbons, it is between 65% and 85% (IMF, 2012). The fiscal regime for the extractive industries should also be progressive (Broadway and Keen, 2010; IMF, 2012; Wen, 2018). Progressivity ensures that the government participates in sector rents and also shares the risk of market shifts. For investors, progressivity provides protection during periods of low earnings and is preferable to unforeseen changes in the regime during periods of high earnings. The level of progressivity is decided based on the level of exposure, taking into account the incentives to invest and which party is best positioned to manage the risks (Daniel et al., 2010).⁷⁰
- 3.32 **Due to their regressive nature, developed countries have reduced or eliminated the use of royalties.** Royalties have evolved away from those based on gross production in favor of ad valorem royalties that yield greater progressivity⁷¹ (Daniel et al., 2010). In Canada, for example, royalties levied on net

⁶⁹ Given that the extractive industries are a primary activity that generates extraordinary economic rents compared with other sectors, a higher tax burden can be imposed without stifling development of the sector. Moreover, with final prices for its output determined on international markets, this tax burden does not necessarily distort the other activities in the economy that use it as an input.

⁷⁰ One method examines the sensitivity of the average effective tax rate to either prices or a project's internal rate of return (IRR): in a progressive fiscal regime, the effective tax rate should increase by more than the price or the IRR. Another method looks at the government's share of a project's “net benefits,” which implies progressivity based on costs (IMF, 2012).

⁷¹ Royalties may be charged per unit produced (ad quantum) or on the value of gross production (ad valorem). Some countries have designed scales for levying royalties that set different rates based on prices, production, the characteristics of deposits and type of minerals in the case of mining, and even profits.

profits—similar to income taxes—are used. Norway and the United Kingdom⁷² dismantled their royalty systems in the hydrocarbons sector, migrating to tax-based systems with cost deduction arrangements that have allowed them to capture a significant share of extractive industry rents while maintaining incentives for private investment (Nakhle, 2010).

E. Governance of the extractive industries within a transparency and integrity framework

- 3.33 Transparency and integrity are necessary to improve governance of the extractive industries.** Transparency helps to reveal weaknesses and dysfunction in the institutional systems governing the extractive industries (IDB, 2020; Vieyra and Masson, 2014; Florini, 2007; Schiavo-Campo and Sundaram, 2000; Bellver and Kaufmann, 2005; Hale, 2008) and allows efficiency gaps in the use and allocation of public resources to be identified (Kahn et al., 2018). It also helps to build trust between stakeholders in the extractive industries, with a view to ensuring the stability and social, environmental, and economic sustainability of governance systems in the sector. This is reflected in better macroeconomic performance (Esanov and Heller, 2011; Andreula et al., 2009; Hameed, 2005; Parry, 2007), lower levels of corruption, and greater benefits from sector activities (Christev and Esanov, 2018; Kolstad et al., 2008, Kolstad and Wiig, 2009; O'Higgins, 2006). However, transparency alone is insufficient. Accountability and citizen participation—taking into account issues of gender equity⁷³ and diversity—are also critical for strengthening governance in the extractive sector (Kaufmann et al., 2019; EITI, 2018). Recent guidelines under the project “Leveraging Transparency to Reduce Corruption” indicate that with effective accountability, generalized transparency, and active civic participation, corruption is likely to be lower than where efforts focus solely on transparency (Eisen et al., 2020).
- 3.34 Legal and institutional transparency frameworks are based on legal, voluntary, and targeted initiatives that allow for monitoring and evaluation.** Binding legal and regulatory frameworks are formal mechanisms in which the State is responsible for ensuring compliance (laws and regulations). The Dodd Frank Act in the United States⁷⁴ and European Union directives⁷⁵ are two examples of this. Countries join voluntary transparency mechanisms due to the reputational benefits of complying with them (international standards such as the [EITI](#), the IMF's Fiscal Transparency Code, the OECD, the International Council on Mining and Metals, and the Kimberly Process).⁷⁶ Targeted transparency and monitoring policies verify information quality and facilitate access to information (audits and dissemination

⁷² The United Kingdom only charges royalties on mature wells with licenses awarded prior to 1982, while Norway levies them only on licenses awarded before 1986.

⁷³ Actions suggested by the EITI initiative include strengthening female leadership in consultation and decision-making processes, incorporating gender equality objectives into work plans, and promoting gender equity through communication and dissemination activities.

⁷⁴ This law requires the disclosure of payments relating to the acquisition of licenses for exploration, production, and other activities in the extractive sector. It also requires mining companies to provide information on the origin of all crude minerals produced.

⁷⁵ These require large oil, gas, and mining companies registered in Europe to publish details of any payments to foreign governments.

⁷⁶ See Annex VII for details of these initiatives.

platforms such as MapaRegalías,⁷⁷ CIMA,⁷⁸ MapaInversiones).⁷⁹ Points of comparison and evaluation systems allow the quality of sector governance to be assessed against that in other countries (such as the [NRGI](#) and the Transparency International index) (Vieyra et al., 2014).

- 3.35 **It has recently been suggested that information be published on beneficial ownership in order to forestall new cases of corruption in the extractive industries.** Beneficial owners are the natural persons who ultimately own or control a customer on whose behalf a transaction is being conducted or who exercise ultimate effective control over a legal person or arrangement (FATF, 2012). Identifying beneficial owners can prevent money laundering, facilitate tax collection, and support transparency in markets (de Michele and Barreix, 2019; IDB and OECD, 2019). In the extractive sector, it is important to identify and publish beneficial owners throughout a project's life cycle (bidding and contract, operating phase, and revenue management) to mitigate the risks created by opacity in the extractive sector (IDB, 2018; FATF, 2014; NRGI, 2015). When implementing measures geared toward greater transparency in the sector, countries should consider legal changes that strengthen the transparency of beneficial owners (Vieyra et al., 2019). The EITI and the IMF recommend that a public register be kept of beneficial owners.
- 3.36 **The disclosure of contracts and licenses is becoming standard practice in many countries with extractive industries.** Transparency in awarding licenses reduces information asymmetries between the government, companies, and society. Governments obtain information from companies with a view to: (i) enhancing their knowledge of sites; (ii) accurately measuring the value of those sites; and (iii) strengthening their negotiating position. Companies are attracted to invest in the sector in light of the estimated financial returns, based on available information on the value of the site. Citizens are mobilized to try and ensure that governments and companies are accountable (Jarquín and Brathwaite, 2014).
- 3.37 **International organizations and initiatives suggest that mechanisms are needed to promote information disclosure by the extractive industries across the entire value chain.** In particular, information should be disclosed regarding reserves, production, exports, and sales. There is also a need for the public availability of comprehensive, frequent, and precise information on fiscal revenue from natural resources. This information should be included in budget documentation and regular fiscal reports.⁸⁰ The IMF has published an international standard to allow officials responsible for compiling fiscal statistics to define and classify fiscal revenues from natural resources (IMF, 2017). This has been adopted by the EITI as an international data standard. Fiscal statistics should be consistent with the IMF-recommended methodology.
- 3.38 **The audit process should be integrated between the different stakeholders in the extractive sector.** This applies to both extractive companies, where audits by the national tax authority are recommended, and the tax authority itself, for

⁷⁷ See [Box 4](#).

⁷⁸ See [Box 5](#).

⁷⁹ See [Box 6](#).

⁸⁰ IMF (2019), principles 3.2.6 and 4.4.1.

which audit by an external body is recommended. Audits should be undertaken on an ongoing basis and their results made publicly available. Transfers to subnational governments should also be subject to audit. In distributing natural resource revenues at the subnational level, rules are required regarding which entities receive subnational transfers, the formula according to which they distributed, and their respective audit.⁸¹

- 3.39 **Where a country has one or more sovereign funds, there is a need to establish rigorous governance and transparency principles.** The [Santiago principles](#), for example, promote transparency, good governance, accountability, and prudent investment practices, while also fostering more open dialogue and a deeper understanding of the activities of sovereign funds. Fund objectives, governance arrangements, and funding and withdrawal mechanisms should be clear and established in the legislation. It is important that any withdrawals be approved through the national budget. Investment policies should be clear, precise, and published (Allen and Caruana, 2008). It is suggested that funds publish annual reports that specify their operations, fund amount, value of deposits and withdrawals, yields obtained, and a list of assets and their allocation. In addition, annual financial statements should be audited by an external body and reviewed by the legislative branch.⁸²
- 3.40 **Transparency and good corporate governance in natural resource companies help to improve efficiency and reduce the risk of corruption.** Natural resources companies (NRCs) face a risk of corruption due to the size of their commercial operations; the inherent technical and geographic nature of the extractive industries; political interests, which can weaken internal control systems; and political interference, which can undermine institutional arrangements (Vieyra et al., 2019). Transparency and corporate governance structures facilitate NRC compliance with regulatory and legal responsibilities. An alternative to direct government intervention in State-owned companies is an institutional structure of governance based on the separation of functions and clear rules. This model has three elements: (i) an openness to competition; (ii) the separation of functions; and (iii) corporate governance rules. Autonomous regulatory agencies are part of this model, providing support for orderly, transparent, and secure market operations and ensuring that rules are implemented (Vieyra et al., 2019). To ensure effective corporate governance, it is recommended that NRCs have a publicly available ethics code and that the majority of members of the board of directors be independent of the government.
- 3.41 **NRCs should provide data on their transfers to and from the government, financial statements, implementation of noncommercial activities, and information on production, sales, and enterprises.** It is suggested that regulations be introduced that determine transfers between the government and the NRCs, and that updated information be published on the value of transfers between these parties (Ter-Minassian, 2017; Mussachio and Pineda, 2019). Companies should provide information on payments to the government by project and revenue instrument, including cash payments. This information should also be cross-checked against government revenues. In addition, NRCs should publish

⁸¹ RGI, 2017; EITI Standard 2016, requirements 2.1, 3.2, 3.3, 4.1, 4.7, 4.8, 4.9, 5.1, 5.2, and 7.1.

⁸² RGI, 2017; EITI Standard 2016, requirements 2.1, 5.1, and 5.3; and IMF (2019), principle 4.3.3.

their budgets and annual reports, including information on finances, operations, and quasi-fiscal activities. Annual audits of their financial statements are recommended. Also of importance are rules that determine the selection of buyers for the NRCs' production, the sales price, transfers of sales revenues, and the disclosure of sales data. In addition, it is advisable for NRCs to publish information regarding their participation in joint ventures and a list of their subsidiaries, including expenditure and revenue from these.⁸³

- 3.42 **Countries adhering to the EITI Standard have recently implemented changes enhancing the transparency of artisanal and small-scale mining.** Addressing the problem of lack of information on artisanal and small-scale mining, several EITI countries have sought to: (i) improve access to reliable data on artisanal mining; (ii) understand the contribution made by artisanal and small-scale mining to national economies; (iii) raise awareness about issues related to artisanal and small-scale mining; and (iv) support capacity-building activities for sector formalization and feasibility studies on how to cover artisanal and small-scale mining in EITI reports. Côte d'Ivoire has included studies in its work plans to explore whether the scope of EITI reports should be extended to include artisanal and small-scale mining. Ghana, Guyana, Mali, the Philippines, Senegal, Suriname, Tanzania, Togo, and Zambia have already taken the decision to include artisanal and small-scale mining in their EITI reports and are conducting studies to document the challenges and design a report process that can be applied to the artisanal and small-scale mining sector. Other countries have started to discuss issues related to artisanal and small-scale mining at forums attended by stakeholders; among them are Afghanistan, Ethiopia, Liberia, Madagascar, Mongolia, Mozambique, Papua New Guinea, the Philippines, Tanzania, and Zambia. In Burkina Faso, Mali, and Guinea, EITI information campaigns have targeted sites occupied by artisanal miners. These efforts have helped to: (i) enhance transparency in the sector; (ii) advance formalization of the sector; and (iii) spark and provide platforms for public debate (EITI, 2018).

⁸³ RGI, 2017; EITI Standard 2016, requirements 2.6, 4.2, 4.5, and 6.2; and IMF (2019), principles 4.4.2 and 4.4.3.

IV. LESSONS LEARNED FROM THE IDB GROUP'S EXPERIENCE IN THE EXTRACTIVE INDUSTRIES

- 4.1 The IDB Group's experience with respect to the extractive industries is limited.^{84,85} An analysis of a sample of operations and technical cooperation projects in Latin America and the Caribbean highlights the following main lessons learned:

A. Thematic lessons

1. Lessons learned from actions to improve the quality of institutions and sector governance

- 4.2 **The complexity of the extractive industries and gaps in financing and institutional capacity require the IDB Group to combine resource facilitation with technical assistance.** The IDB Group has supported strengthening of the institutions responsible for governance of the extractive industries. Established in 2007, the Transparency Trust Fund⁸⁶ has supported strengthening of the sector through tools for supervising mining and energy activity in Colombia, Brazil, Ecuador, Trinidad and Tobago, Guyana, and Panama for a total of US\$490 million. Through a US\$15 million grant, the Canadian Extractive Sector Facility (CANEF) has financed technical assistance to Colombia, Peru, and the Dominican Republic, as well as social relations, fiscal and labor policies, and environmental impact.⁸⁷ The IDB Group has also established partnerships with a number of private companies to support inclusive and sustainable development.⁸⁸ In addition, it is working together with civil society organizations to create knowledge and spaces for interaction, as well as to maximize the positive impact of interventions on their beneficiaries.⁸⁹ The IDB Group offers tools and experience to support Latin American and Caribbean countries in strengthening institutions in the mining and

⁸⁴ This analysis was based on documentation for the following projects: ME-L1051, GY-L1039, GY-L1043, BO-X1001, CO-L1126, and CO-L1140. The regional and national technical cooperation operations were as follows: RG-T2243, RG-X1129, RG-T3049, RG-T12849, CH-T1095, CO-T1482, PE-T1384, BR-M1180, BR-T1337, BR-M1127, and CH-M1059. The documents analyzed include loan proposals and loan contracts, results matrices, risk matrices, institutional capacity assessments, operating regulations, multiyear execution plans and annual work plans, technical cooperation operations that support loans, project monitoring reports, midterm and final evaluations, project completion reports, and evaluations by the Office of Evaluation and Oversight (OVE).

⁸⁵ Thirteen projects were analyzed from the private sector portfolio: (i) Alto Maipo Hydroelectric Power Project (CH-L1067); (ii) Camisea Project (PE0222); (iii) Delba Vessel (Phase 1, BR-L1120, and Phase 2, BR-L1294); (iv) Etileño XXI (ME-L1110); (v) Genser Power Inc. Sucursal Ecuador (EC3874A-02); (vi) Peru LNG Project (PE-L1016); (vii) Pozo Almonte and Calama Solar Photovoltaic Power Project (CH-L1069); (viii) Somin Compañía Minera de Sonora S.A.P.I. de C.V. (ME4047A-01); (ix) Inversiones Hidroeléctricas S.A. ("IHSA") (NI3847A-01); (x) Transmisora Mejillones S.A. (CH3881A-01); (xi) Hidrovías Transport (RG-L1049); (xii) San Jacinto-Tizate Geothermal Power Project (NI-L1057); and (xiii) Cerro Pabellón Geothermal Power (CH-L1102).

⁸⁶ [The IDB's Transparency Trust Fund.](#)

⁸⁷ For further information, see CANEF.

⁸⁸ For example, projects have been implemented with mining companies such as Anglo American (RG-M1300) and Newmont (AR-T1211), aimed at maximizing shared benefits in the projects' area of influence. In particular, it is important to build strategic partnerships with the private sector aimed at supporting the scalability of local development initiatives.

⁸⁹ This includes regional and international forums and organizations such as the Pacific Alliance; EITI Secretariat; Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development; World Economic Forum; and Council of the Americas. See the IDB's Office of Outreach and Partnerships.

energy sectors, including its ability to secure the participation of international experts and other financing entities.⁹⁰

- 4.3 **IDB Group projects in the extractive industries involving stakeholders from government, civil society, and industry have benefited from effective coordination and communication between the interested parties.** To ensure vertical and horizontal coordination within the sector, the IDB Group has promoted alignment between public and private sector stakeholders by means of policy dialogues. In 2014 and 2015, the IDB Group held a series of dialogues that led to a first draft of its strategy for involvement in the extractive sector. From 2017 to 2019, dialogue meetings were held to develop a long-term vision for the extractive industries and related activities in Latin America and the Caribbean (IDB, 2020). Similar processes have been replicated at the national level in Peru and in Buriticá, Colombia.⁹¹ The IDB is also involved with a variety of national public-private platforms aimed at developing consensus and strategic guidelines for sector policy, including Alianza Valor Minero and Corporación Alta Ley in Chile, the Dialogue Group on Mining and Sustainable Development (GDIAM) in Colombia, and the Center for Convergence and Good Mining and Energy Practice (Rimay) in Peru. These platforms have demonstrated the power of multi-stakeholder participation in developing strategic guidelines for preparing and implementing sector policies.⁹²

2. Lessons learned from actions to promote the economic leveraging and sustainability of extractive industries

- 4.4 The Bank has supported the development of a vision for long-term development of the extractive industries, based on the following principles: strengthening of the institutional and governance frameworks for the sector in the region; building inclusion and shared benefits with local communities; transforming the extractive industries into engines of innovation and productivity; and encouraging the extractive industries to adopt practices consistent with sustainability and the environment (IDB, 2020). In line with the principles articulated by the IDB at the regional level, the development vision for the extractive industries should reflect a

⁹⁰ For example, the Bank offers fiscal stability instruments that can be used as a hedging mechanism against oil price volatility; these instruments work by channeling resources into the financial system, helping to reduce transaction costs. In addition, the Bank has carried out an action plan for institutional strengthening of the Dominican Republic's Ministry of Energy and Mines.

⁹¹ In addition, the Bank has developed a conceptual framework aimed at assisting Andean and Amazon basin countries to develop proposals for submission to the IDB in consultation with indigenous organizations, with the following objectives: (i) obtaining financing based on consultations with indigenous peoples; and (ii) undertaking a series of environmental and sociocultural activities before governments initiate bidding processes for oil or gas exploration and/or exploitation blocks (Donahue, 2000).

⁹² In Chile, Alianza Valor Minero [Mining Value Alliance] is a public-private institution that seeks to represent the interests of the multiple stakeholders that coexist in the sector; it promoted the participatory drafting of Chile's National Mining Law in 2019. Corporación Alta Ley is an organization that aims to coordinate existing capabilities in public and private entities in the mining industry, with a view to promoting innovation, technology transfer, and collaboration between all entities in the ecosystem, thereby improving the competitiveness and sustainability of the mining business. Colombia's Dialogue Group on Mining and Sustainable Development (GDIAM) is made up of individuals with diverse visions and interests surrounding the exploitation of mining resources in Colombia; it promotes informed and respectful conversation regarding the different visions represented, with a view to influencing public debate. In Peru, Rimay is a platform for dialogue and technical discussion aimed at creating consensus that allows mining and energy resources to be better leveraged in support of sustainable development.

multi-stakeholder participation process in the countries that is sensitive to the challenges and opportunities faced by each of them and of the territorial areas in which extractive activities take place.⁹³

- 4.5 **Actions to improve human capital must be accompanied by institutional strengthening measures.** To achieve greater integration of the sector into the local productive fabric, human and institutional capital must be built at the local level.⁹⁴ As part of the effort to strengthen subnational capacities, support is needed to improve the quality of institutions and the efficiency of service delivery, as well as training for professionals and local officials. Administrative optimization processes require the strengthening of regulatory frameworks, as well as management monitoring tools that support continuous adjustments and improvements and also guide the strengthening of human resources, with a view to achieving better outcomes and public services. Likewise, the Bank has supported leadership by women in the mining sector through the program “Emerging Women Leaders in the Extractive Sector.” This initiative seeks to empower and increase the visibility of the leadership abilities of women with high potential in the extractive industry, while also opening up areas for collaboration between the public and private sectors to promote issues of gender equality in the sector.⁹⁵
- 4.6 **The IDB Group has provided financing for companies in the extractive industries, but innovative solutions are required.** For example, the IDB Group has developed innovative instruments such as contingent grants that use climate funds to mitigate risk in the event that exploration is unsuccessful.^{96,97} The Aurus Copper, Water & Energy Fund (CH-M1059) has established a financing mechanism with venture capital for startups in the copper value chain. Impact projects have also been executed to mobilize government and private sector grants—for example, through trust funds, project-specific grants, and IDB Lab. At the same time, the IDB has financed guarantee and investment funds to support entrepreneurship among indigenous peoples;⁹⁸ these can be used to promote the creation of companies servicing extractive industries in indigenous territories.⁹⁹ In addition, the Bank has participated as a guarantor of the application of Article 13

⁹³ The Bank has developed a methodology that facilitates the consensus-driven vision on the role of mining in development. It involves working with a high-level group that is representative of the various stakeholders in the sector to prepare concrete proposals on the core areas of consideration (economic, social, environmental, and institutional) in development. The agreements that come out of the process take the form of specific recommendations and a roadmap for implementation.

⁹⁴ CH-M1059, BR-M1180, BR-T1337, BR-M1127, and CO-T1482.

⁹⁵ RG-T3050.

⁹⁶ Under the Program to Promote the Development of SME Suppliers and Contractors for the National Oil Industry (ME-L1051), support was provided to the second-tier banking sector through implementation of the Climate Investment Fund, as a complement to the resources provided by commercial banks.

⁹⁷ The IDB Group also offers arrangements such as fee-for-service and guarantees that have not yet been used in the sector.

⁹⁸ For example, the Indigenous Development and Promotion Program (CH-L1105) and the Social Inclusion Program for Persons with Disabilities in Panama (PN-L1160).

⁹⁹ This is the model for indigenous participation used for oil exploitation in Alberta, Canada.

of ILO Convention 169 regarding indigenous and tribal peoples, with reference to the participation of indigenous peoples in extractive industry profits.¹⁰⁰

- 4.7 **Projects are strengthened by early actions to build awareness and involve stakeholders.** The IDB Group's experience indicates that it is crucial that information, dialogues, consultations,¹⁰¹ cooperation, and partnerships be considered, as well as the investment of substantial time to understand the reality of vulnerable populations and identify positive experiences. Digital platforms and technological solutions such as WiConnect3¹⁰² facilitate these efforts as they allow sector-specific data to be collected. There have also been positive experiences related to the management of environmental liabilities in mining areas.¹⁰³ Another good practice is the hiring of expert staff with backgrounds and language and cultural skills relating to the indigenous communities; this has proven effective in facilitating relations with local communities who are vulnerable to negative project impacts, especially in terms of understanding their concerns, needs, and expectations surrounding the projects.¹⁰⁴ Based on a review of good practices and lessons learned through sector work, numerous guides and manuals have been prepared to facilitate multi-stakeholder engagement and optimize sector impacts.¹⁰⁵
- 4.8 **The IDB Group's Environmental and Social Sustainability Framework helps to manage project risks, strengthen their sustainability, and reassure investors.** Some of the IDB Group's nonsovereign guaranteed transactions associated with the extractive industries have involved large and complex undertakings, with substantial environmental and social implications. Inadequate evaluation and management of these issues could have significant effects over the long term, particularly on vulnerable and indigenous populations, natural resources, and biodiversity. The high quality of the IDB Group's environmental and social safeguards, together with the implementation of integrated environmental, sociocultural, and health and safety management plans and procedures, has been

¹⁰⁰ Cooperation agreement between Rockwood Lithium and the Atacama Peoples' Council, which includes participation of this community in profits from lithium extraction in Chile's Atacama salt flats (2016).

¹⁰¹ The Bank has extensive experience of consulting with indigenous peoples and has developed protocols to ensure the sociocultural viability of projects financed by operations such as CH-L1105 and PN-L1160. The Bank also has a long history of serving as an honest broker in relations between governments, private companies, and indigenous peoples in operations such as social investment funds, the Orígenes Program in Chile, and public and private projects for the Camisea gas pipeline in Peru.

¹⁰² [WiConnect3](#) is an IDB Group geo-referenced platform for sustainable development in Latin America and the Caribbean.

¹⁰³ AR-L1026.

¹⁰⁴ BR-M1180, BR-T1337, BR-M1127, BO-X1001, RG-T2849, RG-X1129, and CO-T1482.

¹⁰⁵ In addition to collecting information on good practices for multi-stakeholder engagement (Milano, 2018), guidelines and manuals have been prepared in areas such as territorial analysis, municipal development, and technological innovation. See, for example, the manual for the strategic analysis of territorial sustainability, which aims to operationalize mechanisms for the early participation of stakeholders in the design and implementation of projects sensitive to territorial sustainability conditions (Alianza Valor Minero, 2020); the guidelines for preparing municipal development plans (applied to cities in Argentina with extractive activities) (IDB, 2016); and the guidelines on public sector tools for promoting best practices in the mining sector through technological innovation (Masson et al., 2013), among others.

essential for mitigating these risks.^{106,107} The IDB Group's strict environmental and social standards and monitoring have provided comfort to co-lenders, (syndicates) B lenders, and other financial partners with respect to environmental and social risks and have played a fundamental role in attracting leading institutional investors with an interest in environmental and social issues. In addition, the ability to use the integrated economic-environmental modeling platform during the preparation stage of operations provides empirical evidence regarding the different trade-offs that can occur between investments, natural capital, and ecosystem services.¹⁰⁸ At the same time, lessons learned from Bank-supported infrastructure projects conclude that positive environmental benefits and outcomes are possible when biodiversity is integrated throughout the entire project cycle. Operations that anticipate and manage the risks presented by the loss of biodiversity, natural capital, and ecosystem services will be successful (IDB, 2012).

- 4.9 **The selection of suitable counterparts is important for promoting sustainability in the extractive industries.** The IDB Group's experience with operations related to the extractive industries illustrates the importance of working with sophisticated strategic counterparts of good repute (including sponsors, contractors, buyers, and lenders) that have a significant track record in sustainable extractive operations and peripheral infrastructure. Project sponsors should participate meaningfully in extractive industry projects from an administrative and financial point of view, contributing not only their internal experience in terms of design, implementation, operation, and management but also their financial support, with significant equity positions. This ensures the transfer of modern technologies, as well as the financial commitment and capacity to raise additional funds to cover possible financing gaps. Lastly, sponsors should also demonstrate that they have sound corporate governance, in order to address the risks associated with management, reputation, and stakeholder relationships, and also to implement best practices in transparency, accountability, and community participation. In some cases, the IDB Group has benefited from the technical know-how and experience of co-lenders and B lenders involved in projects in the extractive industries. The qualified financial investors that have participated in nonsovereign guaranteed operations have included national financial partners with deep knowledge of the local industry, which facilitates the efficient structuring of operations and the mitigation of risks.

3. Lessons learned from actions to tackle climate risk

- 4.10 **A long-term perspective is essential for guiding short-term decisions.** The IDB Group has supported countries in the region in modeling their decarbonization pathways with a long-term perspective, as well as in designing Long Term Strategies (LTSs) (IDB and DDPLAC, 2019; RG-T3028; RG-T375). LTSs will help governments to identify the transformations required for decarbonization, together

¹⁰⁶ Bank-financed studies using the Cultural Land Use Analysis (CLAN) methodology support the implementation of good practice standards in social impact evaluation (Pointet, 2004).

¹⁰⁷ The safeguard policies also include health and safety in the workplace, an aspect of particular importance in the extractive industry (especially in mining projects).

¹⁰⁸ Although this methodology has not been used in extractive sector projects supported by the Bank, it has been used in infrastructure projects such as the Cultural Heritage Tourism Management Program (BO-L1182) and the operation "Towards a Green Economy: Support for Costa Rica's Decarbonization Plan" (CR-L1142).

with the economic benefits from using modern, more efficient technologies and the synergies between decarbonization and economic development. LTSs also help to anticipate and manage the risk of stranded assets and their associated fiscal and financial costs, while also minimizing and compensating for possible social impacts and determining a sequence of policy reforms and public investments that are needed to achieve a carbon neutral future.¹⁰⁹ The IDB Group has prepared knowledge products on the climate transition risk in the region, including the risk of stranded assets in the energy sector due to the insufficient ambition of the current NDCs (RG-T2728; Binsted et al., 2020), the risk of excessive investment in natural gas plants (RG-T3193; Gonzales-Mahecha et al., 2019), the fiscal risk for oil-exporting countries (RG-K1447; Solano-Rodriguez et al., 2019), and management of the distributive impacts of carbon taxes (RG-E1563).

4. Lessons learned from actions to mitigate revenue volatility and the depletion and obsolescence of extractive industry resources.

- 4.11 **IDB Group operations have helped to manage volatility in commodity prices by strengthening fiscal institutions.**¹¹⁰ In mining and hydrocarbons, the IDB Group has supported countries with loans and technical assistance in the area of policies to strengthen fiscal sustainability and improve public financial management. In Mexico, for example, the Program to Support the Consolidation of Fiscal Sustainability (ME-L1090) included measures to strengthen the protection of the public finances against oil price fluctuations,¹¹¹ while experiences in Argentina, Colombia, and Ecuador included measures to strengthen NRC management and efficiency.¹¹²

5. Lessons learned from actions to support greater transparency and integrity

- 4.12 **The IDB Group has supported the development of technology platforms aimed at improving transparency and integrity, yet stronger institutional coordination of these is still required.** Support has been provided to strengthen information management mechanisms and the monitoring of natural resource and investment projects. These mechanisms improve accountability and the traceability of public investment while also allowing the identification of institutional challenges. Specifically, support has been provided for visualization and geo-referencing information tools such as MapaRegalías ([Box 4](#)), CIMA ([Box 5](#)), and MapaInversiones Perú País Minero ([Box 6](#)), which are useful for supervising extractive activities. Nonetheless, operational experience has highlighted the urgent need for improvements in the following areas: (i) standardizing the lexicon of departments and ministries with a view to harmonizing concepts; (ii) coordinating information management strategies so that decisions are made on the basis of reliable, authentic information; and (iii) aligning institutional structures

¹⁰⁹ For example, Costa Rica's National Decarbonization Plan 2018-2050 addresses the institutional requirements and the implications for achieving the proposed transformation. Among other actions, the plan explicitly provides that State revenue will have to be decoupled from gasoline sales prior to large-scale electrification of the fleet of light vehicles.

¹¹⁰ CH-L1069, RG-M1300, and AR-T1211.

¹¹¹ The Bank has implemented more than 40 policy-based loans aimed at improving medium-term fiscal frameworks. See the Fiscal Policy and Management Sector Framework Document (GN-2831-8).

¹¹² ME-L1090, PR-L1151, CR-L1081, EC-L1251, AR-L1283, and CO-L1242.

(ministerial, material, and procedural). This highlights the importance of generating sector information that can serve as a common platform for multi-stakeholder engagement.

B. Crosscutting lessons

- 4.13 The IDB Group has supported countries in mobilizing resources to improve sector governance and develop peripheral infrastructure for extractive projects.** The IDB's private sector window provided valuable support for development of Peru's Camisea gas pipeline project (Corral et al., 2018; Corral et al., 2019), with the transportation of natural gas and construction of the associated liquefaction plant helping to transform the country into a net exporter of natural gas ([Box 7](#)). This experience demonstrates that intervention in the sector can have a catalytic and sustainable impact on projects, particularly where the work of the IDB Group's public and private sector windows is effectively integrated and different intervention and financing mechanisms are combined. The IDB Group's experience of supporting both comprehensive institutional reform and modernization efforts and the design and construction of major energy, water, road, and urban infrastructure projects in Latin America and the Caribbean indicates that many of the related challenges are not exclusive to the extractive sector and require cross-sector approaches. The IDB Group's interventions have sought to virtuously integrate the extractive industries into local economies and global value chains. By providing nonsovereign guaranteed financing to companies on the periphery of the extractive industries, the IDB Group has had significant positive impacts on value chains in the sector, including the expansion of commercial opportunities for local companies, by enabling the transfer of technology and knowledge from large companies and spurring corporate social responsibility initiatives (especially through health and education programs), all of which has attracted additional investment and created jobs. Nevertheless, there are structural problems that restrict linkages with local suppliers and distributors: (i) high barriers to entry that limit the ability of small and medium-sized local actors to compete or offer supply to project developers (especially multinational companies); (ii) lack of reliable data from many of the actors in mining and other extractive segments and information asymmetries that benefit the most sophisticated actors; and (iii) inadequate training and lack of capacity to meet the required quality standards.
- 4.14 The application of IDB Group safeguards can help to ensure the effective management of environmental and social risks in extractive projects.**¹¹³ IDB Group actions have highlighted the need to create a protocol to guide teams in the event of natural disasters or acts of God. This would allow them to mitigate potential risks and foster cooperation and a coordinated, rapid response by the different IDB Group departments involved in a particular project,¹¹⁴ as in the case of the Petroecuador project ([Box 8](#)). In accordance with its Environmental and Social Sustainability Policy, the IDB Group requires its clients to identify, manage, and mitigate risks and possible environmental and social impacts during the planning, design, and implementation phases of projects.

¹¹³ As indicated in the [Environmental and Social Policy Framework](#) and [IDB Invest's Environmental and Social Sustainability Policy](#) and the experiences gained in operations ME-L1051, GY-L1039, and RG-T2243.

¹¹⁴ CH-M1059, BR-M1127, and BR-T1337.

V. LINES OF ACTION FOR IDB GROUP WORK IN THE EXTRACTIVE INDUSTRIES

- 5.1 The above sections have highlighted the potential of the region's extractive industries to drive growth, as well as the weaknesses that need to be addressed in order to achieve an institutional framework that is consistent with socially inclusive and environmentally sustainable development. To this end, the following lines of action are considered important:

A. Line of action 1: Strengthen the design and implementation of institutional frameworks and arrangements for the extractive industries in the region

- 5.2 The region needs to make further progress in reducing its institutional weaknesses with a view to improving the efficiency and productivity of the sector across the entire value chain.
- a. **Strengthen laws, regulations, decrees, processes, and instruments to enhance sector efficiency and productivity with a vision of sustainability.** This includes: (i) the review and assessment of regulatory and contractual frameworks in light of sector needs and existing institutional capacities, including artisanal and small-scale mining; and (ii) adherence to voluntary good practice standards for improving governance and access to specialized knowledge and evidence regarding the effectiveness of policies and regulations.
 - b. **Strengthen public sector management capacities for effective management of the extractive industries.** This includes improvements to (i) technical and operational capabilities in ministries and regulatory and oversight bodies and the design of coordination mechanisms; (ii) the technical and operational skills of key public officials and stakeholders involved in the extractive industries, through training and knowledge exchange programs, especially in extractive activities involving greater complexity and transformation, such as lithium extraction; (iii) human resource recruitment and retention functions; and (v) technical tools for evaluating, regulating, and supervising extractive industry activities, including digital tools for monitoring contracts and optimizing critical processes; as well as supervision, monitoring, and control.

Knowledge gaps:

- (i) Generate evidence regarding the impact of weak institutional frameworks and mechanisms on integrated development of the extractive industries.
- (ii) Strengthen analysis of the ways in which institutional arrangements have influenced the productivity and efficiency of extractive industries in the region. This includes generating specialized knowledge of contractual arrangements and their impact on efficiency and the structure of production in the sector.
- (iii) Assess public policies and their effects on extractive industry governance in the context of weak institutions, i.e. the relevance of adopting international best practices in the specific context of Latin America and the Caribbean.
- (iv) Evaluate options for promoting private investment in the extractive industries, such as public-private partnerships (PPPs). The potential development of such private investment should take place as part of a fiscal

sustainability framework, with an emphasis on promoting economic and social development, and should be led by entities with the technical and financial capacity to promote and help structure these types of investment.

B. Line of action 2: Promote socioenvironmental sustainability, shared value generation, integration, and economic diversification by the extractive industries

5.3 Building a shared vision of the role of the extractive industries in sustainable development, optimizing their multiplier effect on the population and other economic sectors, and reducing social conflict all require opportunities for the effective participation of sector stakeholders, public and private alike, as well as improved integration and economic diversification of the extractive industries through appropriate institutions and policies. In addition, support will be needed for innovations to optimize the use of resources, which typically emerge from the private sector. To reduce the environmental impact of the extractive industries, efforts should be pursued, and incentives offered, to ensure that energy consumed in these industries comes from renewable sources and that carbon emissions are duly offset.

- a. **Strengthen mechanisms for dialogue, policies, action plans, and civil society participation and awareness-building in extractive projects, with particular attention to gender gaps, protection of civil society, diversity, and conflict mitigation.** To strengthen cooperative actions between governments, industry, and civil society: (i) support should be provided for initiatives and mechanisms for multi-stakeholder engagement and the strengthening of capacities that help to involve local communities in sector governance and in all stages of the extractive industry project life cycle; and (ii) particular emphasis should be placed on exchanging information about practices and support for policies that incorporate a gender and equity approach in the sector and foster the effective participation and protection of indigenous peoples, Afro-descendant groups, and populations in situations of vulnerability.
- b. **Develop institutional capacities and policies that support the effective management of sociocultural and environmental risks, the protection of natural capital, and the efficient management of public resources from the extractive industries, as well as equitable access to those resources.** It is important to encourage the use of a strategic, cumulative approach in the evaluation of socioenvironmental risks in the extractive industries, while also strengthening analysis and monitoring actions that ensure the effectiveness of socioenvironmental safeguards and the protection of natural capital. This includes efforts to improve standards and enhance arrangements for the management and accessibility of information on natural resources, the land use situation, and resources generated by the sector. It also encompasses the adoption of best practices and policies that support the efficient, transparent, and equitable management of resources generated by the extractive industries.
- c. **Promote policies and practices that help to deepen production linkages and maximize economic benefits from extractive activities.** This includes: (i) updating and modernizing local content requirements in sector investments, including policies to support the participation of local companies, women, and

indigenous groups in extractive industry value chains; (ii) building knowledge, human capital, and infrastructure with a view to linking local scientific and technological capabilities, cooperative planning efforts, and investment in the extractive industries; (iii) promoting research and development activities in the extractive industries, including knowledge transfer and the development of technical and technological solutions adapted to the local environment, with the aim of increasing value added in the value chain (upstream, midstream, and downstream) and improving production efficiency and sector competitiveness; and (iv) supporting innovation in the extractive industries that promotes local linkages, a smaller environmental impact, industrialization, and participation in global value chains.

- d. **Promote integrated land use and the planning of investments in shared-use infrastructure.** As a complement to the strengthening of production linkages, support should be provided to parties interested in formulating integrated territorial development plans that explore the possibilities for economic and territorial diversification and also identify and leverage synergies between public and private investment. Given that the extractive industries both demand and provide infrastructure (road connectivity and logistics, telecommunications, water and sanitation, electricity, and value chain linkages), integration will be sought with other productive sectors, as well as planning for the development of shared infrastructure. These may be in activities related to the extractive industries, such as shared infrastructure and the development of value chains focused on regional integration and regional value chains.¹¹⁵ Lastly, efforts will be made to take advantage of coordinated actions to strengthen institutional frameworks and stimulate investment from the private sector. Support should also be provided to update cadastres of extractive activities, improve access to available information on territorial conditions, production potential, and exclusion areas, and improve the effectiveness of spending based on government revenue from the extractive industries, including financial administration, procurement, and public investment systems, thus optimizing the integration of the extractive industries into the local socioeconomic fabric.

Knowledge gaps:

- (i) Evaluate the impact of local content policies on sector competitiveness and socioeconomic inequality.
- (ii) Conduct studies to gain a better understanding of the effects of the extractive industries on the different dimensions of development, with special emphasis on local impacts, including environmental impacts, gender and diversity, the distribution of rents to the local population, and cross-sector relationships within the extractive industry value chain.
- (iii) Generate evidence and data regarding the social and environmental impact of the extractive industries on women, indigenous peoples, and Afro-descendants, both in local communities and as members of the sector labor force, with special attention paid to artisanal and small-scale mining.

¹¹⁵ Value chain reallocation and integration processes that allow for greater regional integration.

- (iv) Evaluate the impact and effectiveness of services and products associated with the extractive industries, as well as options for optimizing production linkages.
- (v) Evaluate the impact of illegal and criminal activities associated with the extractive industries.

C. Line of action 3: Strengthen institutions to facilitate the transition to low-carbon economies, including managing the risk of stranded assets and identifying new opportunities

5.4 The following actions will be required to encourage the adoption of institutional strengthening actions to support compliance with targets for reductions in greenhouse gas emissions, while also preparing the countries to face the challenges inherent to the energy transition:

- a. **Strengthen institutional capacities for planning the transition to low-carbon economies and managing the socioeconomic and fiscal impacts of this process.** Support should be provided for creating institutional mechanisms and long-term strategies for planning the energy transition. Priority actions include the estimation and mitigation of the effects of this transition on the public finances, including the risk of stranded assets (particularly in countries that are producers of oil, gas, and coal). Subsidy policies for fossil fuels should also be reviewed, an area in which reforms are needed to streamline and/or gradually eliminate these subsidies. Support should also be provided for identifying sectors and communities that will face difficulties due to the energy transition, while assistance to fossil fuel companies will be necessary in order to support their conversion processes. Lastly, support should be provided to assist countries to identify opportunities arising from the energy transition, as is the case with the expected increase in demand for minerals and metals.
- b. **Support the strengthening of regulatory frameworks that help to reduce the dependency on fossil fuels—including hydrocarbons and energy minerals (coal)—and also mitigate the impact of domestic production.** (*Consistent with the [Energy Sector Framework Document](#).)* This encompasses support for preparing and implementing standards that contribute to technological innovation, including developing renewable energies, improving the management of value chains in the industry, optimizing production processes in the extractive industries to reduce greenhouse gas emissions (e.g. technologies to capture and sequester gases and effluents), and other efforts to increase environmental sustainability in the extractive industries. Strengthening regulatory frameworks also includes designing clear and transparent regulations. Furthermore, it means providing regulatory stability, with obligations balanced, to reduce uncertainty and encourage private investment.

Knowledge gaps:

- (i) Understand the impact of decarbonization and energy transition strategies, including an economic, physical, and socioenvironmental evaluation of stranded assets and their implications for policy decisions.
- (ii) Quantify the potential cost of compensation measures associated with the energy transition in Latin America and the Caribbean.

D. Line of action 4: Advance the development of fiscal institutions that help to manage revenue volatility and increase the progressivity of fiscal instruments

5.5 The following actions are required to increase countries' institutional capacities for stronger fiscal frameworks that encompass the extractive industries, based on principles of fiscal discipline and long-term sustainability:

- a. **Strengthen fiscal frameworks, rules, and councils, as well as sovereign funds.** This includes the design and implementation of fiscal responsibility laws, fiscal rules, medium-term fiscal frameworks, and fiscal councils, all with the aim of creating mechanisms to help mitigate the negative impact on the public finances of volatility in commodity-based revenues. At the same time, there is a need to promote the implementation and strengthening of sovereign funds as tools for managing resource depletion and market volatility, based on principles of macroeconomic stabilization and intergenerational equity. In addition, it will also be important to promote the implementation of financial hedging for commodities with a view to stabilizing the fiscal accounts and managing the risks inherent to commodity prices. At the subnational level, managing volatility requires integrated management of revenue from the extractive industries, for which revenue and expenditure planning, execution, and reporting processes must be strengthened.
- b. **Strengthen fiscal regimes that are adapted to the development characteristics of the sector, making them progressive and efficient.** This includes actions to increase the institutional capacities of finance ministries and regulatory and control agencies with the aim of improving the main fiscal tools in the sector. These actions should seek to minimize distortions to exploration and exploitation activities in the value chain. There is a particular need to balance the use of fiscal instruments so that they optimize revenue from the extractive industries without discouraging private investment. This includes actions to enhance the complementarity of the tax regimes for the extractive industries and for other sectors. In addition, policies should be promoted that help to improve the tax administration of fiscal resources from the extractive industries at both the national and subnational levels.

Knowledge gaps:

- (i) Strengthen institutional capacity for the implementation of fiscal mechanisms that reduce the impact of volatility in mineral and hydrocarbon prices.
- (ii) Research fiscal instruments that strike a balance between raising adequate amounts of revenue and incentives for private investment.
- (iii) Generate knowledge regarding mechanisms for distributing extractive revenues at the subnational level to facilitate economic and social development.

E. Line of action 5: Promote greater transparency and integrity in the extractive industries

5.6 The following actions are needed to achieve transparency in government revenues from extractive activities and prevent corruption in the sector:

- 5.7 **Strengthen monitoring systems, accountability, and access to information in accordance with international standards.** To facilitate compliance with transparency laws, barriers need to be eliminated in access to concession contracts, licenses, cadastres, and details of the financial participation of the parties involved, in both hydrocarbons and mining. A possible strategy in this regard is to support the adoption of technological innovations that help to monitor and measure project performance and the fulfillment of commitments and targets. It is also important that finance ministries be assisted in improving the quality of information on fiscal revenues from the extractive industries in their budgets and fiscal statistics.
- 5.8 **Support transparency laws with specific sections to address the extractive industries.** This is particularly necessary in laws that encourage governments to publish payments received from extractive companies. For the purposes of accountability, there is a need to strengthen the auditing of subnational transfers and ensure that sovereign fund reports and external audits of fund financial statements are published in a timely manner. Support should also be provided for publishing environmental and social impact assessments of extractive activities. Lastly, it is important that all remaining countries join international transparency initiatives such as the IMF's Fiscal Transparency Code, the EITI, Open Government Partnership, and the Global Forum on Transparency and Exchange of Information for Tax Purposes.

Knowledge gaps:

- (i) Deepen the reporting capacities needed to implement the standards put forward by transparency initiatives.
- (ii) Provide technical advisory services to countries for designing accountability mechanisms.
- (iii) Create mechanisms that also allow private sector companies and civil society to participate in sector transparency and accountability processes.
- (iv) Provide advisory services on the generation of information on artisanal and small-scale mining.

ANNEX I: TABLES AND FIGURES

**Table 1. Imports and exports of minerals, metals, and fuels
as a percentage of imports and exports of goods**

	Fuels		Minerals and metals	
	Imports as a percentage of goods imports, 2013-2017 average	Exports as a percentage of goods exports, 2013-2017 average	Imports as a percentage of goods imports, 2013-2017 average	Exports as a percentage of goods exports, 2013-2017 average
Argentina	12.1	3.5	2.3	3.2
Bahamas	20.5	0.0	0.6	8.7
Barbados	21.3	6.6	0.8	0.9
Belize	12.8	11.3	0.6	0.2
Bolivia	11.5	48.0	0.7	29.2
Brazil	15.8	7.8	3.1	12.8
Chile	16.8	0.9	1.5	54.6
Colombia	9.8	59.6	1.6	1.2
Costa Rica	10.4	0.0	2.1	1.4
Dominican Republic	19.4	2.1	0.9	2.9
Ecuador	12.9	43.6	1.4	1.0
El Salvador	15.3	2.6	1.2	1.3
Guatemala	16.7	4.6	1.0	7.0
Guyana	24.1	0.0	0.7	17.6
Haiti	-	-	-	-
Honduras	17.0	0.2	0.6	2.4
Jamaica	27.4	19.4	0.4	10.4
Mexico	7.8	8.0	2.3	2.8
Nicaragua	13.2	0.3	0.6	0.9
Panama	0.0	0.0	0.1	0.3
Paraguay	13.4	24.5	0.8	0.7
Peru	13.2	11.3	1.1	50.1
Suriname	18.2	17.0	0.6	0.8
Trinidad and Tobago	41.3	56.9	3.7	1.6
Uruguay	13.9	0.9	1.0	0.3
Venezuela	0.6	97.7	1.2	0.4
Latin America and the Caribbean	11.9	12.1	2.1	11.9

Source: World Bank (2019).

Table 2. Main minerals used to manufacture mobile devices

Mineral	Main sources	Use in mobile devices
Aluminium	Australia, China, Brazil	Chasses, circuitry, screen glass, and camera lens
Sand for industrial use	China, United States	Screen glass and semiconductors
Copper	Chile, Peru, China	Electric cables
Tin	China, Indonesia, Myanmar, Peru	Liquid crystal displays and circuitry
Germanium	China	Batteries, displays, electronics and circuitry, and vibration components
Graphite	China, India	Battery anodes
Indium	China, Republic of Korea	Liquid crystal displays
Lithium	Australia, Chile, Argentina, China	Battery cathodes
Platinum-group metals	South Africa, Russia, Canada	Circuitry, capacitors, and plating
Gold	China, Australia, United States	Circuitry
Silver	Mexico, China, Peru	Circuitry
Potassium	Canada, Russia, Belarus	Screen glass
Silicon	China	Semiconductors
Tantalum	Rwanda, Brazil, Democratic Republic of the Congo	Capacitors
Rare-earth elements	China	LED phosphors, screens, speakers, and vibration motors
Tungsten	China	Vibration components
Zinc	China, Peru, Australia	Circuitry

Source: The Geological Society (2018) and the U.S. Geological Survey (2016).

Table 3. The value chain in the extractive industries

Issues	Contracts, licenses, and exploration	Production	Taxation and state participation	Revenue distribution and management	Local impact
Policy, legislation, and regulation	Framework for obtaining rights and licenses	Policy, legal framework, and contract regime for extractive industries	Policy and tax instruments for the extractive industries	Financial and public management and revenue distribution	Environmental and social impact mitigation
Accountability and participation	Processes and procedures for obtaining contracts and licenses	Access to land, compensation, and resettlement	Consultations on taxation and accountability	Transparency and accountability in public investment and the budget	Human rights and labor equity
Institutional capacity and effectiveness	Management of registers, licenses, and geological information	Sector management and coordination	Tax management and governance of State-owned companies	Implementation of the central government budget	Impact assessments and community consultations

Source: Based on Mayorga et al. (2013).

Table 4. Specific characteristics/differences and trends in extractive sectors

Oil	Gas	Mining
Specific characteristics/differences		
<ul style="list-style-type: none"> ▪ Exploration phase is more costly and risky than in mining (involving large, deep sedimentary underground formations, in contrast with mining exploration, where searching and sampling is limited to small areas). ▪ Highly capital-intensive with high demand for highly skilled personnel. ▪ Generation of high rents linked to cost and compensation structures. ▪ Marked government presence through State-owned resource companies. ▪ Presence of oligopolistic market structures that affect price formation. ▪ Diversity of operations (onshore and offshore, as well as conventional and unconventional oil extraction) that present different technical challenges. ▪ Key resource for local energy supply and security. ▪ High potential environmental impact given the magnitude of operations and their proximity to water bodies. 	<ul style="list-style-type: none"> ▪ High complexity in the (transportation and storage) segment due to the nature of the resource, which has high infrastructure requirements. ▪ Complex operating and marketing arrangements due to less integrated chains. (In the absence of storage facilities, direct connections are required between production facilities and the end consumer.) ▪ Measuring and valuing production is complex due to the characteristics of the resource and the absence of globally integrated markets that determine benchmark prices. ▪ High barriers to entry due to complexity, operating costs, and the absence of available markets for the sale of output. ▪ Very detailed contracts required due to operational complexity. ▪ Key resource for local energy supply and security, meaning that local supply is prioritized. ▪ Specific features of the sector are treated in more detail in contracts and provisions than in the legislation. ▪ Existence of environmental risks associated with liquefied natural gas distribution operations, which are an emission source of greenhouse gases that contribute to global warming. 	<ul style="list-style-type: none"> ▪ Development phases (construction and extraction) are more costly and risky than in the oil sector due to the large amounts of land required to develop operations (which means that access to the land must be ensured) and the safety standards required (to house staff and the use of chemicals and explosives). ▪ High costs of decommissioning or abandoning mines, which require guarantees such as rehabilitation plans, financial instruments, and agreements with communities for operating projects. ▪ Intensive in both capital and labor. ▪ High variety of minerals and metals (high volume/low value, such as coal, nickel, and copper; low volume/high value, such as gems and metals). ▪ Scant government participation in operations. ▪ Presence of activities in parallel to the operation, such as small-scale and illegal mining, which present additional environmental and social challenges. ▪ More complex marketing arrangements, requiring connections with supply chains for the global and local industry. ▪ Potential social conflicts due to proximity of operations to communities and settlements. ▪ Potential adverse environmental effects due to the use of toxic substances such as mercury and the contamination of bodies of water.
Trends		
<ul style="list-style-type: none"> * Unconventional oil extraction (shale/tight and coal bed methane) and new extraction methods such as horizontal drilling and hydraulic fracturing. 	<ul style="list-style-type: none"> * Growing interest in the sector as a source of cleaner energy and technological innovation. * Technological developments in the areas of extraction, storage, and transportation that 	<ul style="list-style-type: none"> * Migration to renewable sources of energy that imply both a reduction and an increase in sector demand.

Oil	Gas	Mining
<ul style="list-style-type: none"> * New technologies to improve recovery rates in mature wells and ultra-deep waters. * Adaptation of regulatory frameworks and contract models to differentiate between conventional and unconventional oil. Countries such as Argentina (Law 27,007, Amendment to the Hydrocarbons Law) and the United Kingdom (1998 Petroleum Act, recently modified in 2018) have already differentiated between these in their legislation. 	<p>reduce costs and underpin the viability of both conventional and unconventional gas extraction.</p> <ul style="list-style-type: none"> * Stepped-up investment in gas liquefaction infrastructure in response to increased unconventional gas development (driven by trends in the oil sector). * Opening of markets for unconventional gas outside North America. * Growing interest of oil companies in increasing their participation in the associated and non-associated gas segments. 	<ul style="list-style-type: none"> * Cessation of exploitation activities for highly polluting minerals such as coal. * Increased demand for minerals and metals used in the adoption of alternative sources of energy, such as wind and solar power, e.g. molybdenum, zinc, iron, copper, boron, dysprosium, neodymium, lithium, lead, sodium, and nickel. * Higher demand from the technology industry for metals and minerals such as lithium, lead, sodium, and nickel.

Source: Based on data from the legislation, Halland et al. (2017); U.S. Energy Information Administration (EIA), and Cameron & Stanley (2017).

Table 5. Contract models currently used in the hydrocarbons sector in Latin America and the Caribbean

Contracts	Concessions
<p>Colombia: exploration and production (E&P) contracts, technical evaluation agreements (TEAs), and special contracts.</p> <p>Ecuador: participation, partnership, service delivery, shared management, and specific goods and services contracts among others.</p> <p>Chile: special operation contracts and contracts for specific oil activities.</p> <p>Bolivia: Production sharing, operation, and partnership agreements.</p>	<p>Argentina: Exploration permits and exploitation concessions.</p>
Hybrid (contracts and concessions)	
<p>Brazil: concession and production sharing contracts.</p> <p>Mexico: profit sharing, production sharing, service, and license contracts.</p> <p>Guyana: prospecting and production licenses and production sharing contracts.</p> <p>Peru: license contracts, service contracts, etc.</p> <p>Trinidad and Tobago: Exploration and production licenses (for public and private rights).</p>	

Source: Prepared by the authors based on current legislation.

Table 6. Minerals needed for renewable energy generation

	Eólico	Solar fotovoltaico	Solar concentrado	Captura de carbono	Nuclear	LED	Vehículos eléctricos	Almacenamiento energético	Motores eléctricos
Aluminio	X	X	X	X		X		X	X
Cromio	X			X	X	X			
Cobalto				X	X		X	X	
Cobre	X	X		X	X	X	X		X
Indio		X			X	X	X		
Hierro (forjado)	X					X		X	
Hierro (magnético)	X								X
Plomo	X	X			X	X			
Litio							X	X	
Manganeso	X			X			X	X	
Molibdeno	X	X		X	X	X			
Neodimio (proxy de tierras raras)	X						X		
Níquel	X	X		X	X	X	X	X	
Plata		X	X		X	X	X		
Acero (ingeniería)	X								
Zinc		X				X			

Fuente: Arrobas et al (2017)

Table 7. Sovereign funds in Latin America and the Caribbean

Country	Sovereign Fund	Assets (2018)	
		US\$ billion	Percentage of GDP
Chile	Social and Economic Stabilization Fund	13.9	4.7
	Pension Reserve Fund	9.9	3.3
Brazil	Brazilian Sovereign Fund	7.3	0.4
Colombia	Stabilization and Savings Fund	3.1	0.9
Mexico	Mexican Oil Fund	1.0	0.1
Panama	Panamanian Savings Fund	1.4	2.1
Peru	Fiscal Stabilization Fund	5.8	2.6
Trinidad and Tobago	Heritage and Stabilization Fund	6.0	26.7
Venezuela	Economic Stabilization Fund	0.003	0.0

Source: Data from official reports and websites for the sovereign funds, press reports (Venezuela), and the IMF World Economic Outlook database (April 2019). Fondo de Ahorro de Panamá is an atypical fund: it is not funded by nonrenewable natural resources (Panama Canal resources are, in principle, renewable), but instead by the privatizations that took place at the end of the 1990s.

Table 8. Implementation status of EITI standards in Latin American and Caribbean countries

Country	Year joined	Current status
Colombia	2014	Satisfactory progress
Honduras	2013	Meaningful progress
Peru	2007	Meaningful progress
Dominican Republic	2016	Meaningful progress
Trinidad and Tobago	2011	Meaningful progress
Ecuador	2020	Yet to be assessed
Argentina	2019	Yet to be assessed
Guyana	2017	Yet to be assessed
Suriname	2017	Yet to be assessed
Mexico	2017	Suspended for missing deadline
Guatemala	2011	Suspended for inadequate progress

Source: Extractive Industries Transparency Initiative.

Table 9. Resource Governance Index for Latin America and the Caribbean, by component

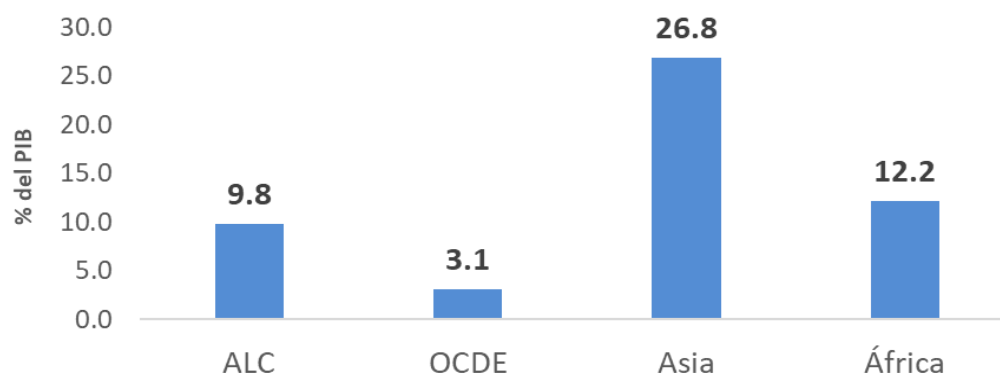
País	Sector	Extracción de valor	Gestión de ingresos	Gobernabilidad
CH	M	74	81	90
BR	P&G	62	78	72
CO	P&G	59	85	67
CO	M	59	82	67
TT	P&G	64	57	71
PE	M	68	57	62
ME	P&G	64	54	65
ME	M	62	53	65
AR	P&G	58	54	58
EC	P&G	51	58	52
BO	P&G	61	51	49
GU	M	42	35	46
VE	P&G	48	34	17

Source: Natural Resource Governance Institute, 2017.

Table 10. Oil, gas, and mining licenses

Oil and gas	Mining
<p>Exploration and exploitation phases:</p> <ol style="list-style-type: none"> Licenses or concession agreements (Royalty and fee systems, private party assumes all risk—adopted by developed countries). Production sharing contracts (Partnership between State-owned and private companies, revenue generated by royalties and taxes, government maintains part ownership of production, allows greater government control—adopted by developing countries). Service agreements (Government signs a contract with the company to provide a service, private party assumes all risk and receives a payment for services rendered if successful—adopted by countries of strategic interest for the extractive industries). 	<p>Exploration and exploitation phases:</p> <p>Licenses or concession agreements:</p> <ol style="list-style-type: none"> Exploration license Granted for the exploration and exploitation phases (4-6 years) Extraction license and development agreements (10-30 years) <ul style="list-style-type: none"> The right to explore for a resource does not necessarily translate into the right to exploit it—requirements must be met. Fiscal revenues are obtained from royalties and taxes.

Figure 1. Economic rents from the extractive industries in Latin America and the Caribbean, 2017



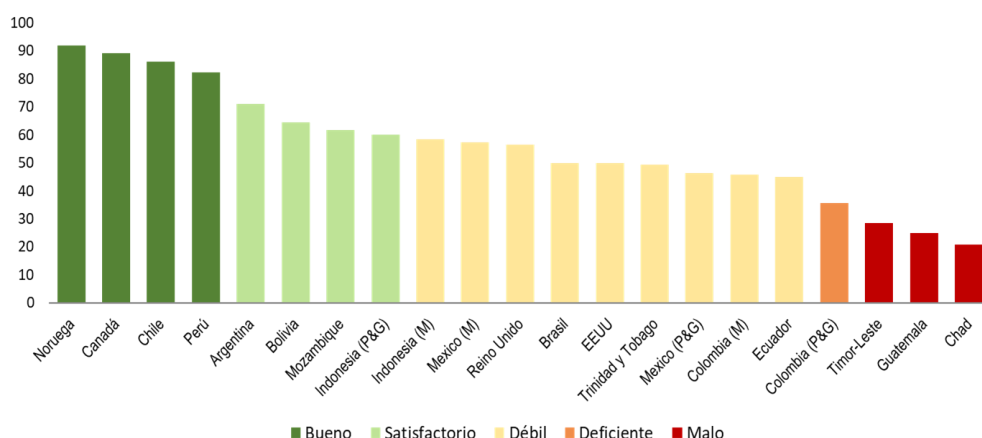
Source: World Development Indicators, World Bank.

Figure 2. Map of mining conflicts in Latin America



Source: [Latin American Observatory of Mining Conflicts](#), 2020.

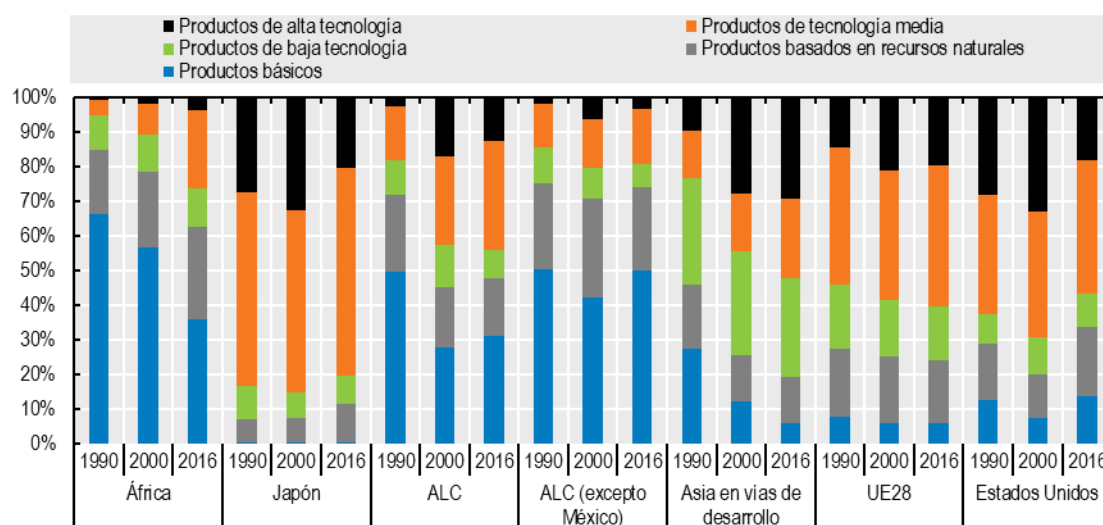
Figure 3. Extractive industries local impact index (2017)



Source: Natural Resource Governance Institute.

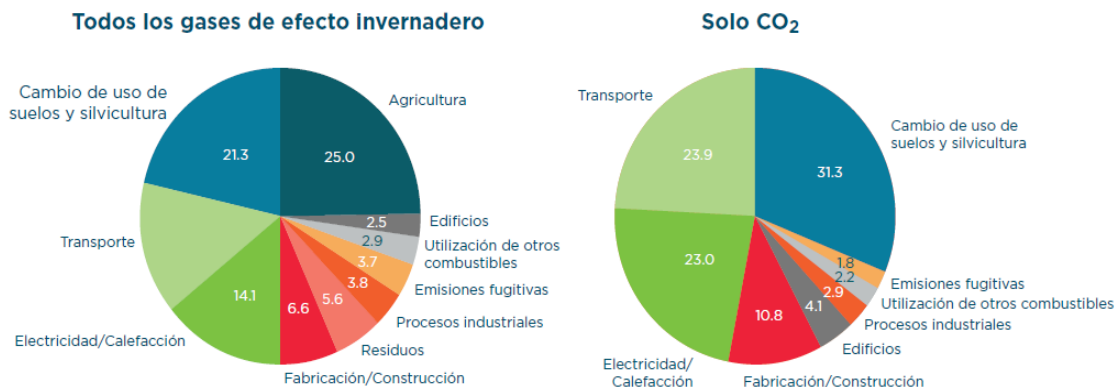
Note: This index measures issues relating to existing requirements for the performance of environmental and social impact assessments, as well as mitigation plans and compliance therewith.

Figure 4. Structure of exports by level of technology, regions of the world (1990-2016)



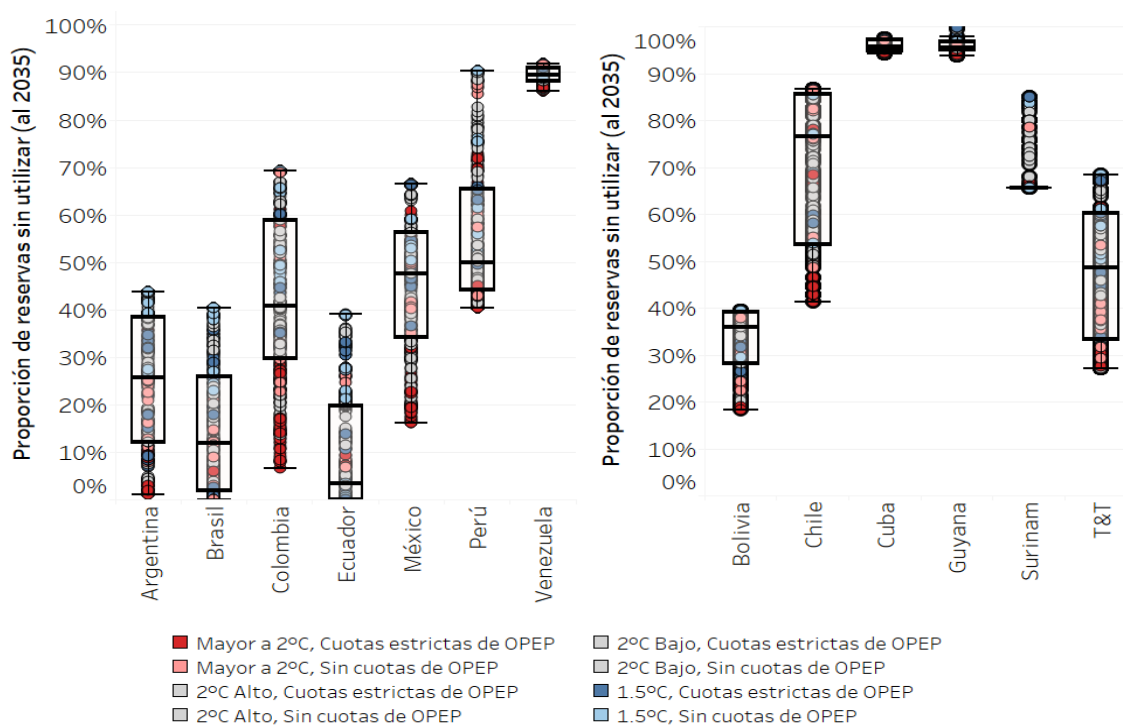
Source: OECD et al. (2019).

Figure 5. Distribution of greenhouse gas emissions by sector in Latin America and the Caribbean, 2016



Source: Saget et al. (2020), based on World Resources Institute (2019) and IEA (2019).

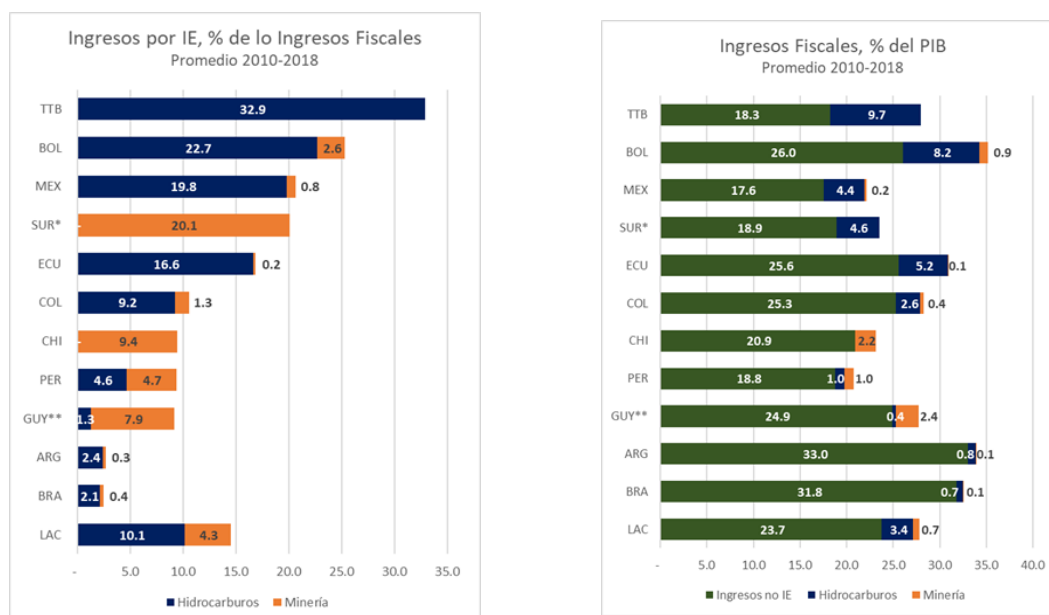
Figure 6. Estimated range of unused oil reserves (2016-2035)



Source: Solano-Rodríguez et al. (2019).

Note: Estimates include the shares of 3P reserves that would be left unused under different scenarios for reductions in greenhouse gas emissions. Left-hand panel shows the largest producers in the region; right-hand panel shows the smaller ones.

Figure 7. Revenues from the extractive industries



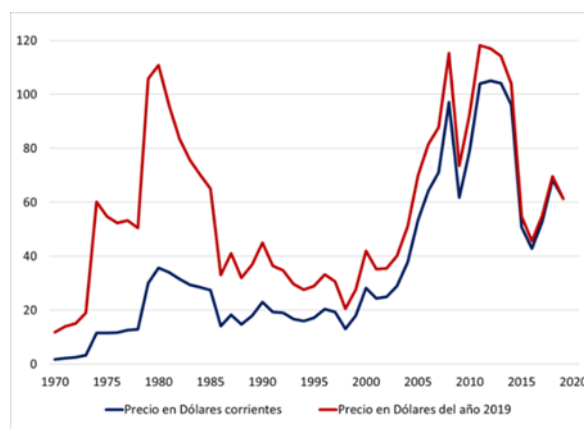
Sources: Total revenue: Fiscal Monitor, IMF, October 2019 and April 2020 (except for Bolivia, Suriname, and Trinidad and Tobago: IMF World Economic Outlook Database, October 2019). Revenues from the extractive industries CEPALSTAT, Database on Fiscal Revenues from Non-Renewable Natural Resources (except for Suriname: Ministry of Finance of Suriname).

* Extractive industry revenue data for the 2015-2018 period. No disaggregated data available for mining and oil.

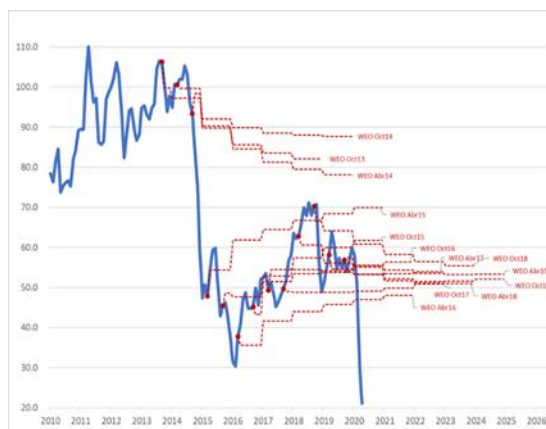
** Extractive industry revenue data only available for 2017.

Figure 8. Volatility and uncertainty in oil prices

a. Oil price (West Texas Intermediate), 1970-2020



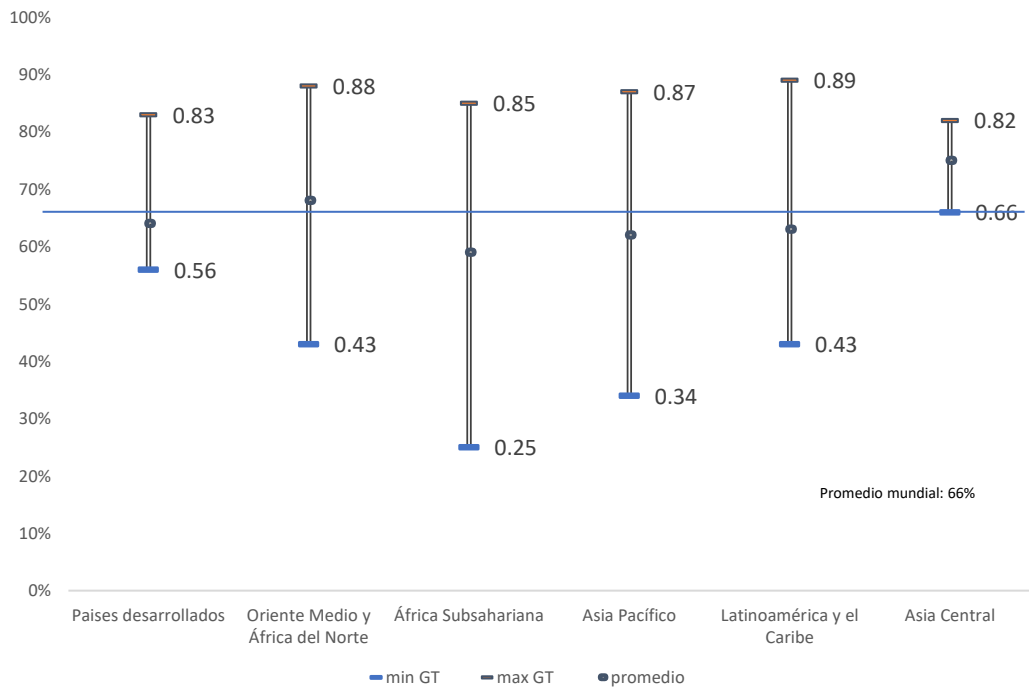
b. IMF oil price forecasts, 2010-2020



Source: IMF World Economic Outlook database, various dates; Bloomberg; and authors' calculations.

Note: Dotted red lines reflect the oil price forecasts provided annually in World Economic Outlook.

Figure 9. Government take in hydrocarbons



Source: Prepared by the authors based on data from the IMF, World Bank, and Rystad Energy.

ANNEX II: BOXES

Box 1. Petrobras: Scandal and recovery

In 2014, Brazil's State-owned company, Petrobras, was involved in a major corruption scandal involving money laundering networks and bribery. The scandal embroiled all of Brazil's political parties, as well as presidents, vice presidents, and public officials in other countries. The arrangements used for bribe payments and undeclared contributions led to inflated prices in Petrobras contracts, aimed at capturing public resources. The undeclared contributions financed between 50% and 90% of all political campaigns in the country (Cuadros, 2016).

Petrobras faced additional financial costs as a result of the scandal, and its reputation was damaged. In 2014, it took a write-down of more than US\$17 billion to account for overvalued assets and the misappropriation of funds, while in April 2015, it declared US\$2.527 billion in cost overruns and corruption from the previous year. The scandal coincided with falling international oil prices, which led to additional losses of US\$12 billion in 2015 (Petrobras, 2015). These costs, together with damage to the company's reputation and an increase in its debt, led Moody's to downgrade Petrobras's debt from investment grade to speculative.

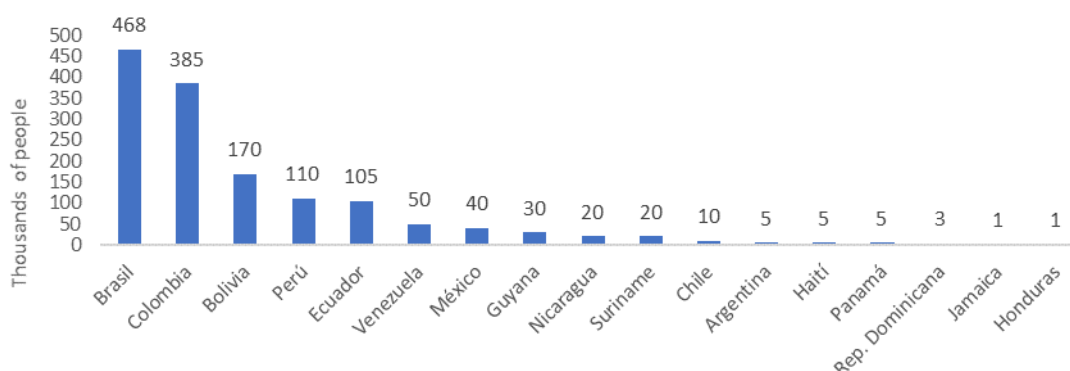
Actions taken by Petrobras in response to the scandal have yielded results. The company has cooperated with investigations and has modified its corporate governance rules. It has also strengthened its legal and regulatory compliance system to ensure the integrity of processes and contractors, as well as the monitoring and sanctioning of corruption cases (Petrobras, 2015). In addition, it has canceled projects, reduced costs, and announced asset sales. In 2018, Petrobras published net positive earnings for the first time in five years, and its debt rating improved.

Box 2. Artisanal and small-scale mining challenges in Latin America and the Caribbean

Artisanal and small-scale mining includes formal and informal mining operations that use simple forms of exploration, extraction, processing, and transport (OECD, 2016). In general, this type of mining makes intensive use of labor but not capital. Globally, artisanal and small-scale mining is estimated to employ around 40 million people¹¹⁶ (Delve, 2019). At present, this type of activity is believed to account for between 15% and 20% of global production of nonfuel minerals, predominantly gold (IISD, 2017).

In Latin America and the Caribbean, artisanal and small-scale mining is especially important in countries like Brazil, Colombia, Bolivia, Peru, and Ecuador (Figure R.2.1). In Brazil, it is calculated that artisanal and small-scale mining employs over 400,000 people (IISD, 2017) and generates around 30% of the country's gold production, as well as diamonds and other minerals (Delve, 2020). In Colombia, over 300,000 people work in this type of mining (IISD, 2017), extracting gold, diamonds, emeralds, coal, and other minerals. In Bolivia, the sector employs 170,000 people (IISD, 2017), with a large portion of them (123,000) concentrated in approximately 2,000 cooperatives that mine gold, silver, lead, zinc, and other minerals (Sandi and Lafuente, 2020). In Peru, artisanal and small-scale mining operations mostly extract gold, though copper and coal are also mined (Delve, 2020), with a workforce numbering approximately 110,000 people (IISD, 2017). In Ecuador, about 100,000 people work in the sector (IISD, 2017), mostly mining for gold. Artisanal and small-scale mining is also prevalent in countries like Guyana and Suriname, where the sector employs around 10% of the economically active population.

Figure R.2.1 – Population employed in artisanal and small-scale mining



Source: [IISD, 2017](#). Figures correspond to the averages of the estimates available by country.

One of the main challenges associated with artisanal and small-scale mining has to do with managing its socioenvironmental impact, especially in the case of informal and illegal mining operations,¹¹⁷ which, in general, do not comply with one or more of formal legal requirements (e.g., obtaining a concession, water use rights, etc.). By failing to implement the mitigation measures required by law and adopt good sector practices, these operations are responsible for significant environmental damages. In addition, illegal mining operations are often carried out in areas where extractive activities are prohibited, such as protected natural areas and buffer zones, headwaters, rivers, etc., which exacerbates their negative impact. Beyond the environmental impacts, many informal and illegal mines operate without occupational safety controls, which leads to high numbers of accidents, as well as deleterious effects on the health of the workers (ILO, 2018; Cárdenas et al., 2017). In many cases, informal and illegal mining is also responsible for exacerbating gender gaps based on stereotypes and prejudices that limit women's opportunities (Arcos Alonso and Rivera Guzmán, 2018), as well as for employing children and using forced labor from neighboring communities (ILO, 2002; Hidrón and Koepke, 2014). In addition, these operations are often responsible for the fragmentation of

¹¹⁶ However, due to the particular nature of the sector, there is uncertainty and scant information about the size of the industry at the country level and the characteristics of the labor force that comprises it.

¹¹⁷ Informal mining is defined as a mining operation that fails to meet at least one of the formal requirements established by local laws, while illegal mining is a mining operation that, in addition to failing to meet legal requirements, is conducted in prohibited areas and has no intent to formalize.

natural habitats and indigenous lands (Ventura Fernández, 2018). The case of Colombia is representative of the socioenvironmental problems caused by artisanal and small-scale mining, with operations emerging in part alongside the proliferation of human settlements in areas marked by the absence of territorial planning and the presence of precarious living conditions determined by a lack of adequate housing and sanitation (water and sewer), health, and education services. Gold mining, in particular, has led to episodes of violence and social unrest, including problems with indigenous communities. The generation of large volumes of debris and the excavation of pits in association with mining activity have led to landslides and the damming of water sources, endangering human life.¹¹⁸

The lack of integration of the regulatory frameworks is a barrier to formalization and supervision of the artisanal and small-scale mining sector. Although some countries in the region (i.e. Bolivia, Chile, Guyana, and Suriname) have moved ahead in establishing mechanisms for the acquisition of specific rights for artisanal and small-scale mining as a way to promote formalization, there are still gaps in the design process that make compliance and supervision difficult. Many of the provisions governing artisanal and small-scale mining are limited to establishing minimum requirements and some general obligations but do not include or are not integrated with environmental, labor, and health and safety standards in mining (IISD, 2017; de Sa and Espinasa, 2018). Moreover, the lack of alignment and consistency of the various frameworks, especially environmental frameworks, hampers permitting processes and impedes formalization (Pantoja, 2016). Furthermore, in some cases, there is insufficient capacity to effectively regulate the impact of mining activities and enforce the obligations of mining titles (Gutierrez et al., 2017). There is a fundamental need in the region to improve mining cadastres (e.g. making extensive use of technology) as a key instrument for unifying title registries and monitoring mining activity, which would contribute to formalization (artisanal and small-scale miners tend not to keep records) and the adjudication and legal certainty of titles, as well as providing a mechanism for supervision (Ortega et al., 2009; Vio Gorget and Walter, 2017). On this final point, only Peru has established a modern cadastral system (Ortega et al., 2009).

Although Latin America and the Caribbean faces major challenges in the implementation of policies intended to address problems in the artisanal and small-scale mining sector, there are successful cases that have improved sector management and generated lessons learned. In Bolivia, Empresa Boliviana del Oro was created as a mechanism to control the trade in gold in the Amazon region, helping to curb the illegal market; a small royalty was also established for mining cooperatives, incentivizing small miners to form groups, organize, and start to regularize their activities (SPDA, 2014). The legalization and formalization of artisanal mining has been promoted in Brazil through the creation of the Artisanal Mining Statute and the commercialization of gold under the Artisanal Mining Permit (SPDA, 2014). In Colombia, the Cooperativa Multiactiva Agrominera de Íquira was formalized and obtained the Fairmined certification¹¹⁹ (Echavarría and Gonzáles Parias, 2016). In Peru, legislation was enacted to strengthen efforts to combat criminal activity associated with illegal mining, strengthen environmental supervision, and facilitate efforts to formalize the artisanal and small-scale mining sector (SPDA, 2014). In addition, subcontracting and marketing agreements have been negotiated between large companies and ASM operations, as in the case of the company Poderosa (UNEP, 2012).

These experiences suggest the need for the region's countries to orient their efforts towards: (i) strengthening legal, regulatory, and institutional frameworks to promote the regularization of informal mining; (ii) establishing simplified licensing frameworks to promote compliance and effective management of socioenvironmental impacts from a strategic perspective; (iii) updating mining cadastres and establishing land use policies that zone separate areas for artisanal and small-scale mining and large-scale mining; (iv) utilizing fair trade certification programs to benefit small miners who meet minimum environmental and labor standards; (v) improving access to financing in order to upgrade technology and increase productivity; and (vi) ensuring that in cases involving illegal mining, interdiction processes are conducted in line with the rule of law and respect for human rights. Complementarily, it is important to steer efforts towards reducing information gaps in the sector, in terms of both the magnitude of artisanal and small-scale mining and the generation of disaggregated data on the labor force employed in this type of mining.

¹¹⁸ One example is the landslide that occurred in Nariño in 2014 ([Pantoja Timarán and Pantoja Barrios, 2016](#)).

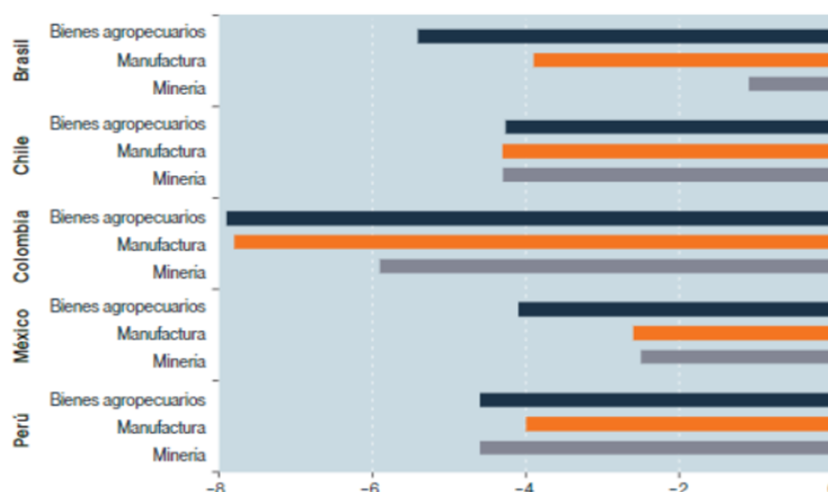
¹¹⁹ The Fairmined standard promotes responsible practices in artisanal and small-scale mining ([Echavarría and Gonzáles Parias, 2016](#)).

Box 3. Regional integration and the extractive industries

Selling commodities, characterized by very low value added, on the international market is one of the challenges facing the extractive industries in Latin America and the Caribbean. The region's extractive industries could be strengthened considerably through cross-border linkages by which commodities would be processed in neighboring countries with better conditions for doing so and then sold as products with greater technological sophistication, more value added, and higher quality. This is not a simple process; it requires adjustments along several dimensions of the logistics and supply chain, as well as in the trade policies of the countries that host these chains.

Logistics costs in Latin America and the Caribbean are high, even higher than formal trade protections (Box R.3.1.); reducing these costs is essential for subregional production linkages. This means improving access routes, logistics services, border crossings and points of entry, and crossborder trade systems (customs, interoperability of single trade windows, authorized economic operator programs, risk management, etc.). The commodities produced by the extractive industries are particularly heavy and voluminous, which raises the associated logistics costs.

Box R.3.1 – Impact of the cost of internal transport on exports by sector and country



Source: "Muy lejos para exportar. Los costos internos de transporte y las disparidades en las exportaciones regionales en ALC" (IDB, 2013). Notes: The coefficients represent the percentage change in exports that occurs with a 1% increase in shipping costs.

But the challenge also lies in developing and hosting more sophisticated industries for processing commodities, and, by extension, creating production clusters, cultivating corporate-academia-government relationships to develop technical talent, defining suitable regulatory frameworks, and in general establishing good conditions for functional and environmental sustainability in the industry. The participation of investment promotion agencies can be decisive in attracting companies of global standing that can help process commodities and turn out a good quality product. For example, since 2019 the IDB has been financing a program in Ecuador to support investment promotion through the country's national investment promotion agency (EC-L1243), with a number of productive sectors, including the extractive industries, receiving priority attention.

Lastly, production chains are consolidated when countries effectively align their trade policies, e.g., through the negotiation of formal integration agreements, such as free trade agreements or agreements establishing customs unions. These agreements reduce trade costs and bring stability to trade relations, providing a better framework for the development of regional production chains. Complementarily, policies to facilitate regional labor mobility in the extractive industries can also contribute to the success of regional chains by consolidating the labor market and making it more efficient. Proposals such as the creation of a national and regional "mining passport" that would allow workers to provide services in any country based on information provided on their skills and training, as well as medical exams, could benefit the region's extractive industries.

Box 4. MapaRegalías in Colombia

In 2014, with IDB support, Colombia's National Planning Department launched the MapaRegalías platform with the aim of reducing the cost of monitoring the government's use of resources and providing geo-referenced information and data on royalties¹²⁰ from the extractive sector (Vieyra and Masson, 2014).

This platform is currently one of the main transparency tools used to track activities and resources associated with the extractive industry.¹²¹ The introduction of MapaRegalías has also been associated with a general increase in efficiency, as measured by the amount of time taken to complete or finalize investment projects (Lauretta et al., 2019). For further information regarding the outcomes of this transparency endeavor, see Arisi, Cortés, and Vieyra (2017).

Box 5. The Argentine Mining Information Center (CIMA)

In 2017, Argentina's Mining Policy Secretariat began the development of a unified information system. In 2018, an information system was launched for the Argentine Mining Information Center (CIMA) with a view to resolving the fragmentation of information created by the federal structure of government in Argentina.¹²² The platform included content regarding (i) levels of activity and production, external trade, employment, prices, the results of the 2017 mining census, the legal framework, and infrastructure; (ii) industrial minerals and their uses; (iii) assistance for mining producers; (iv) studies and reports; (v) Geographical Information System; (vi) Register of Mining Providers; (vii) Mining SME Forum; and (viii) international initiatives. More recently, information has been included in CIMA on mining investment projects and investors, as well as socioenvironmental indicators consolidated at the national level. CIMA was also incorporated into the geographical information system for the Unified Mining Cadastre. In future, CIMA aims to centralize all information on mining by including all of the provinces to create a homogeneous product.

Box 6. MapalInversiones Perú País Minero in Peru

The platform "[MapalInversiones Perú País Minero](#)" was developed by the IDB and the Decentralization Secretariat attached to the Presidency of the Council of Ministers in Peru. IDB support was facilitated by a contribution from the IDB's Transparency Trust Fund. The platform helps to align the country with international commitments such as the Open Government Partnership. It also helps to consolidate the progress made by Peru in the area of transparency.

The [MapalInversiones](#) initiative is based on MapaRegalías in Colombia, and is an IDB initiative that seeks to enhance the transparency and efficiency of public investment in Latin American and Caribbean countries by developing and implementing information management platforms. The platform visualizes and maps public investment projects in various Latin American and Caribbean countries, with data on housing, health, and transportation infrastructure. As a result, citizens can monitor in real time where and how institutions are investing, while also providing the government and its officials with high-quality information to improve decision making. In addition, companies can improve their competitiveness and optimize their business plans thanks to an open information environment.

¹²⁰ Royalties are tax revenues generated through the extraction of the country's natural resources; these are subsequently channeled into the General Royalties System and used to finance public investment projects at the local level.

¹²¹ [EITI Colombia, 2017](#).

¹²² Under Argentina's federal structure of government, the provinces own mining rights and are responsible for supplementing the procedures for concessions contained in the National Mining Code. They are also responsible for monitoring operations, collecting royalties, and formulating sector development policies.

Box 7. The Camisea development

Camisea consists of two interdependent natural gas projects that have had a positive impact on Peru's energy matrix and economic performance over the last 20 years. Although interdependent, the projects were developed and financed separately.

The first project was initiated in 2002 and consisted of an upstream component (deposits and separation facilities) developed by a multinational consortium in the forest north of Cusco; a midstream component developed by Transportadora de Gas del Perú, consisting of two parallel pipelines (gas and liquids) with a joint length of 1,269 km, traversing the jungle, Andes, and coastal desert; and a downstream component consisting of fractionation plants and distribution infrastructure for industrial and residential consumption in Lima and the surrounding area.

The second project, also known as Peru LNG, was initiated in 2006 and consisted of 400 additional kilometers of pipeline (part of which runs parallel to the pipelines from the first project), a liquefaction plant with a capacity of 600 million cubic tons per day, fractionation plants, and port facilities for exports.

The IDB Group participated in the financing of both projects. Under the first project, it provided US\$135 million of the total US\$811 million cost for the midstream component; this was in the form of a non-sovereign guaranteed A/B loan comprising a US\$75 million A tranche and a US\$60 million B tranche syndicated with commercial banks. The IDB Group also provided US\$5 million of sovereign-guaranteed financing to strengthen regulatory agencies and the government's socioenvironmental monitoring responsibilities, in addition to establishing an economic development fund. In the case of Peru LNG, the IDB approved a non-sovereign guaranteed A/B loan for US\$800 million (divided into two equal parts) as its contribution to the total project cost of US\$3.8 billion.

Development of the projects between 2004 and 2015 required high levels of employment over time (approximately 100,000 direct and indirect jobs), more exploration in the region, the development of new industries (liquefied natural gas and gas-fueled power generation), and strengthening of the regulating environment for the country's energy sector. The presence of the IDB Group's resources and technical assistance had a positive influence not only on the design, construction, and operation of the project infrastructure, but also on the institutional context in which the projects were developed and the mechanisms that continue to ensure a sustainable and responsible hydrocarbon operation today (Corral et al., 2018; Corral et al., 2019).

The project also represented a milestone from an environmental standpoint. Not only were the IDB Group's environmental safeguards used to mitigate the impact of the transportation component financed by the Group, but their application was also extended to the project's upstream component. In addition, the IDB Group promoted and implemented a variety of supervision and monitoring mechanisms to build awareness of the project in civil society and ensure that commitments were met. It also used its participation in the project to go beyond impact mitigation, with the development of socioenvironmental management systems that improved conditions in the project's area of influence (Corral et al., 2018).

These actions included the creation of a fund to finance local projects, improvements to national parks, stronger protections for indigenous communities, and the creation of a Sustainable Development Commission for Paracas Bay. Lastly, financing was provided for improving the institutional capacities of agencies responsible for the inspection, supervision, and monitoring of socioenvironmental mitigation measures, as well as public consultations with national and international nongovernmental organizations to give them a voice in project design, mitigation, and monitoring (Corral et al., 2019).

Box 8. Petroecuador project

In 2011, a loan contract was signed between the Republic of Ecuador and the IDB to finance execution of the project "Modernization of Pumping Stations on the Esmeraldas-Quito Multiproduct Pipeline" (EC-L1040).

The IDB supported development of the strategic vision for the project, the central objective of which was to improve energy efficiency and environmental management. Environmental works focused on remedial works in pumping stations and improvements to American Petroleum Institute (API)-standard tanks. As part of the environmental works financed, four mud pits were removed along with contaminated earth, and a single temporary mud holding tank was built in the pumping stations.

Outputs from the environmental works included the following: (i) removal and treatment of earth in the area previously occupied by four mud pits, and replacement of these by a single temporary holding tank; (ii) installation of a new temporary holding tank for mud and other waste in the pumping stations and launch of its operation; and (iii) works to improve the treatment of effluents in the API-standard tanks.

In summary, the company's environmental management was modernized and improved by removing holding pits that represented an environmental liability for the company, while effluents to API-standard tanks were reduced alongside the concentration of hydrocarbons ultimately discharged.

Box 9. Local content policies relating to vulnerable groups

Local content policies relating to job creation can be used to support and improve the quality of employment for women in the extractive industry and to promote the participation of traditionally disadvantaged groups in the workforce. Initiatives such as the Women in Hard Hats program in Queensland, Australia, is an example of the government and industry partnering to provide training and direct pathways to employment for women in mining (Grice, 2018). Likewise, programs such as Voisey's Bay Joint Education and Training Authority (JETA) in Canada have worked to create direct routes to employment for indigenous peoples. The training funds provided by the Government of Canada and administered by JETA and members of the indigenous communities provided training and other programs aimed at maximizing job retention and developing skills. Cooperation efforts between the Vale mining company, indigenous governments, and the Governments of Canada, Newfoundland, and Labrador led to a 55% increase in the number of indigenous employees working in the mine (OECD, 2018). In South Africa, the Broad-Based Black Socio-Economic Empowerment Charter in the mining sector is another example of an initiative to promote labor participation among specific groups—in this case, a traditionally disadvantaged one. The 2018 statute includes specific targets for women and disabled employees with scoring criteria, and it is integrated into broader national strategies (Deloitte, 2019).

ANNEX III: ELEMENTS OF A LEGAL FRAMEWORK FOR THE EXTRACTIVE INDUSTRIES¹²³

- Ownership of the natural resource.
- Authority to allocate rights for the development of natural resources.
- Establishment of a clear framework for the role of the competent bodies of government, for companies, for landowners, and for civil society and local communities.
- Identification of the authorities and procedures by which the government allocates mineral or petroleum rights.
- Rights and obligations of both the license holder and the government.
- Clear, transparent, competitive, and nondiscretionary procedures for issuing exploration and production rights, including those issued by contracts, along with the technical and financial qualifications needed to hold a mineral or petroleum right.
- Permissible contract types.
- Assurance to a prospective license holder or contract signatory of security of tenure, which includes issues relating to development rights, assignment rights, and retention rights.
- Listing of the obligations of the mineral or petroleum right holder to explore, invest, and produce the mineral or petroleum or else relinquish the right so that it can be made available or assigned to another party ready to take on those obligations.
- Reporting requirements of the license or right holder.
- Conditions for voluntary relinquishment and termination for cause of the license or right.
- Health, safety, and environment (HSE) requirements related to the license or right.
- Procedures for management of possible land-use conflicts between different claimants or users.
- Dispute resolution procedures.
- Establishment and implementation of an effective communications strategy.
- Definition of the mandate and role of State-owned NRCs and minority state equity in mining, oil, and gas companies.
- Granting of the right to construct and own infrastructure specific to petroleum or mining operations (for example, pipelines or rail routes).
- The main principles of the fiscal regime.

¹²³ Based on Cameron and Stanley (2017, pp. 67-68).

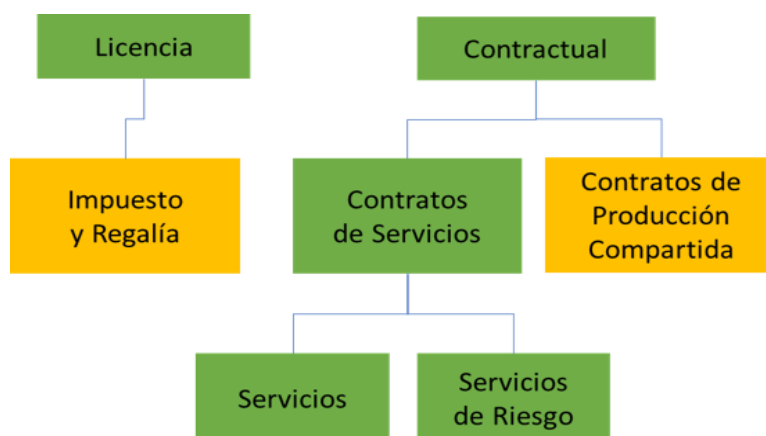
ANNEX IV: LICENSES AND CONTRACTS¹²⁴

Governments frequently allow private companies to develop natural resources by allocating exploration, development, and exploitation rights. Private sector participation takes two main forms (Figure 2.2):

- *Licenses or concessions allowing exploration or exploitation of a given area, subject to taxes and royalties, and*
- *Contractual arrangements, which include production sharing contracts and service (or risk service) agreements.*

Both are common in the hydrocarbons sector, while mining is dominated by licensing and concession systems. Each of these legal forms may be designed to have an economic outcome that is broadly similar to that of other systems.

Figure. Forms of private sector participation and fiscal regimes



Source: Daniel (2015).

Licenses

Under a system of licenses, the investor or group of investors that obtains a license has the right to extract and own 100 percent of the produced resource. The licensee bears all risks and funds all operations. Government revenues under licenses generally involve tax and royalty systems (see below).

In the case of mining in particular, licenses are frequently used to award exploration and extraction rights for an area to a company or other legal entity, such as a consortium. They are a legal instrument that establishes rights and obligations for the investor and the government in addition to those included in the relevant mining legislation. Rights are transferred by the authorities in exchange for a commitment to undertake exploration, development, and/or production. Most countries with mining activities offer two types of licenses: exploration and extraction. Transparency in the licensing process is essential

¹²⁴ Based on Cameron and Stanley (2017, pp. 75-77).

due to the associated risks of inefficiency and corruption (Sayne, Gillies, and Watkins, 2017).

There are two basic mechanisms for allocating licenses to companies: open-door systems and auction-based awards. In practice, many countries use both systems depending on their specific circumstances (Cameron and Stanley 2017, pp. 92-93; Huurdeman and Rozhkova 2019, pp. 12-13).

- *Open-door systems.* Licenses are awarded on a first-come first-served basis, or after negotiations between the government and (generally few) interested parties, which may be preceded by expressions of interest. In the absence of publicly disclosed criteria, direct negotiations may be nontransparent and may facilitate corruption. It is essential that direct awards be made transparently, through the use of clear, publicly available award criteria, the publication of negotiation results, and the use of external oversight bodies (Tordo, Johnston and Johnston, 2009).
- *Auction-based allocation of licenses.* Where there is extensive interest on the part of potential investors, licenses may be awarded using the auction method. Investors are asked to bid on parameters such as bonus payments, or royalties or work programs that exceed minimum requirements.¹²⁵

Sector authorities should select the areas for auction and determine the technical and financial qualifications required of the bidders. The fiscal terms of the contract must be determined, as well as the variables that can be bid on, which should be simple and objective.

Contracts

Production sharing contracts (PSCs). This type of contract is a popular form of State participation in the extractive sector, and is frequent in the oil and gas industries. PSCs are used in several Latin American and Caribbean countries, including Brazil, Guyana, Mexico, Trinidad and Tobago, and Suriname.

- The State, as the concessionaire (often through an NRC), retains the oil rights and appoints a contractor to help the government develop these resources (the government may hold an equity stake). The parties agree that the investor will cover exploration and development costs and finance all operations. Contractors recover their costs by retaining part of the output, known as “cost oil/gas,” and share the remaining output (“profit oil/gas”) with the government, paying corporate income tax on their share of the benefits. Contractors are not entitled to any payment if no resources are discovered or developed. The government retains and sells its share of the profit oil/gas.

Service contracts. This type of contract applies almost solely to oil and gas, and is used in several countries in Latin America and the Caribbean. The government or NRC hires an investor as contractor and pays a fee for the service of extracting oil as long as production targets are met. The contractor does not obtain rights to the petroleum, which remains in the hands of the State. Service contracts are often used in countries that emphasize sovereignty over resources, including countries in which national oil companies have complete control over oil and production rights.

¹²⁵ Cramton (2010) offers recommendations for designing and implementing auctions of rights.

- *Pure service contracts.* Remuneration for services provided and work performed is determined by a list of prices for each type of work and service provided by the contractor. The contractor does not assume any exploration risks.
- *Risk service contracts.* The companies provide upstream services at their own risk in exchange for an agreed service fee expressed in terms of units of production. The fee is set so that the contractor achieves an agreed ex ante return on their investment. The contractor assumes part of the exploration risk.

ANNEX V: TYPES OF TAXES APPLICABLE TO THE EXTRACTIVE INDUSTRIES

Corporate income tax

The corporate income tax (CIT) is a core component of most fiscal regimes for the extractive industries. It is a tax on the net earnings of companies with economic activities in the country. Application of the CIT to the extractive industries is required to ensure that the return to equity is taxed just as in other sectors (IMF, 2012).

Several countries apply a higher tax rate to extractive activities than to the rest of the economy. One reason for this is a desire to capture a share of project rents; another is to insulate CIT rates for the extractive sector against a general decline in CIT rates, as seen internationally in recent decades.

Some countries have special CIT regimes for the extractive industries that address specific issues in the sector. A number of topics of particular importance are reviewed below.¹²⁶

Accelerated depreciation of exploration and development costs. Many countries provide incentives for exploration and project development, allowing incurred costs to be recovered over a relatively short period (e.g. five years). Accelerated cost depreciation allows investors to recoup their costs at an earlier stage, and this can help to finance projects, amortize debts incurred during the preparation stages, and reduce risks and interest costs. For the government, however, the consequence of accelerated depreciation is that CIT revenue in the initial stages of production may be very low.

Ring fencing. It is common for fiscal regimes to include a system of ring-fencing that prevents a taxpayer from consolidating earnings, costs, and deductions from different activities or projects for tax purposes. For example, costs in a ring-fenced project may only be offset against income generated through that project, and not against income from a different project. Ring fencing may be applied to oil and gas activities in vertically integrated companies (upstream cost ring-fencing), or to specific areas (i.e. individual projects).

- The absence of upstream ring-fencing allows companies to apply downstream costs to upstream activities, thereby reducing the higher taxes paid on those operations.
- The absence of area-specific ring-fencing can significantly defer government tax revenue, as a company undertaking several projects can offset exploration and development costs for each new project against the revenue from more mature projects that are already generating taxable income.
- The absence of ring-fencing can also discriminate against new entrants who do not have any earnings in the country against which to offset exploration and development expenses (Nakhle, 2010).
- At the same time, a highly restrictive tax ring-fencing system can reduce incentives for exploration. Hydrocarbon companies generally consider tax ring-fencing to be a disincentive to investment. Exploration and development activities may be greater if taxpayers are able to take deductions against current earnings, generating higher

¹²⁶ See Sunley, Baunsgaard, and Simard (2003), IMF (2012), and Cameron and Stanley (2017) for more detailed reviews.

revenue for the government over time by expanding the tax base. Thus, revenue is sacrificed in the initial years in favor of higher overall revenue in the long term (Mullins, 2010).

- Criteria are needed to determine tax ring-fencing. Countries such as Norway and the United Kingdom allow consolidation within a sector-wide ring-fence for offshore production. Developing countries concerned about deferral of revenue may prefer ring-fencing by license (IMF, 2012).

Foreign tax credits. Whether or not a tax paid by a multinational company in the host country can be offset against taxes paid in its home country will depend on tax legislation in the home country and whether there are double taxation treaties between the two countries. For companies whose home countries tax worldwide income, it is important that credits be available in their home countries for taxes paid in the host country (e.g. the CIT). Unusual fiscal instruments may lack counterparts in the home country and therefore fail to qualify for a credit, thus acting as a disincentive to investment.

Transfer prices. Through the use of transfer prices, taxpayers can seek to minimize taxable earnings and maximize deductible expenses in jurisdictions or activities with high tax rates (or vice versa) (Calder, 2017; Sunley, Baunsgaard, and Simard, 2003, p.158). Abusive transfer prices may be difficult to detect and prevent, and can impose high fiscal costs.

- As an example, an aluminum factory that processes bauxite to obtain aluminum will probably be considered a manufacturing operation rather than a mining one, and will therefore be subject to the standard CIT rate. In the absence of rules governing transfer pricing, an integrated company may attempt to use an artificially low transfer price between production and the factory with a view to concentrating benefits in the sector subject to less tax.

Loss carry-forwards. The extractive industries often have an extended or unlimited period during which past losses can be deducted in the current fiscal year.

The information provided by tax rates and fiscal parameters is limited. For example, the treatment of depreciation, loss carry-forwards, and tax ring-fencing are important for assessing a fiscal regime.

Corporate income tax surcharges and natural resource rent taxes

Some countries have implemented fiscal tools aimed at enhancing the progressivity of CIT-based systems and/or capturing more rents from their natural resources.

In some cases, the extractive sector is subject to a variable income tax (VIT). This type of tax uses the CIT base, but varies the rate of tax according to the ratio of taxable profits to gross revenues (subject to upper and lower limits), with the aim of increasing its progressivity. The VIT is relatively simple but may introduce distortions if applied at a high rate, and few countries use it.

Corporate income tax surcharges share similarities with the VIT. The surcharges are added to the standard CIT applied to all sectors of the economy and are triggered and generate additional revenue for the government once project profitability exceeds a defined threshold. Examples of corporate income tax surcharges are the special petroleum tax in Norway, the surcharge tax in the United Kingdom, and Trinidad and Tobago's supplemental petroleum tax.

Resource rent taxes are an attempt to directly tax natural resources (Land, 2010; IMF, 2012), and there are several different approaches to their implementation. In some countries, the tax is triggered once cumulative cash flow for the project turns positive. Negative cash flow in the initial years of the project (during the exploration and development phases) is accumulated in a notional account at an interest rate that, in principle, is equal to the risk-adjusted opportunity cost of capital for the company. An “uplift” may be allowed, which is a predetermined percentage of costs incurred that is added for the purposes of calculating tax deductions.

Resource rent taxes only begin to generate revenue for the government years after production begins, when cumulative earnings from sales exceed cumulative costs (including the cost of capital) from the beginning of the project, or when the stipulated rate of return is achieved. In the case of projects with low profits, the government may not receive any revenue.

Other taxes and nontax revenue¹²⁷

Withholding taxes. Withholding taxes are applied to earnings that are generated in the host country but paid to nonresidents. They are generally applied to payments to subcontractors not resident in the host country, dividends sent to nonresident shareholders, and interest payments to external creditors.

Given that there is no practical way of forcing nonresidents to submit tax returns in the host country, withholding allows governments to tax flows that would otherwise be difficult to tax once sent abroad. It can also discourage excessive payments to nonresidents that could be used to transfer earnings to lower-tax jurisdictions, and thus helps to combat evasion.

Withheld taxes can be a significant source of revenue. However, they can be limited where double taxation treaties exist between the host country and the country of residence of the contractors, shareholders, or creditors. For example, tax withholding on dividends and interest payments is often reduced or eliminated by double taxation treaties.

Capital gains taxation for transfers of interest in the extractive industries. Licenses/contracts and associated rights can change hands. For example, the initial licensee may discover resources during the exploration phase but may not be interested in developing the area, preferring instead to sell the rights. The relevant issues for the fiscal regime are whether capital gains associated with transfers of interest should be taxed, and if so, who can or should tax them (IMF, 2012).

- To encourage exploration and reward risk-taking, taxing transfers should ideally be avoided, as is the case in Norway. Another argument against taxing these gains is that the main objective of specialized or smaller companies undertaking exploration in new areas may be to sell the rights in the event that they are successful. At the same time, and particularly where resource prices have increased during the exploration phase (as in the 2004-2014 period, for example), the substantial capital gains seen in many transfers have been considered by some analysts to be rents. More importantly, the size of the capital gains has attracted the attention of the fiscal authorities.
- Given the international dimension of the ownership structures that may be involved in these transfers (potentially including both residents and nonresidents), the different

¹²⁷ Based on IMF (2012), Cameron and Stanley (2017), and Huurdeman and Rozhkova (2019).

ways in which interest in a project may be transferred and the possible existence of double taxation treaties mean that it can be challenging to determine whether the host government can tax the transfer, and will depend on each case.¹²⁸

Withholding and capital gains taxes belong to a long list of topics concerning the international aspects of extractive industry taxation. Other issues mentioned above include tax credits, double taxation treaties, transfer pricing, and beneficial ownership. Mullins (2010) and Daniel et al. (2019) offer detailed discussions of these topics.

Other tax and nontax payments. There is another set of fiscal tools of generally limited importance for revenue collection. Surface fees may also be levied, for example, by hectare of licensed area. Different fees—fixed or auctioned—are commonly paid, such as license or exploration fees or fees for environmental protection purposes.

Dividends. Government revenues from the extractive sector include dividends paid by NRCs and/or by private companies in the sector that the government has invested in, payable to the government. There have been instances in several countries where governments have imposed abusive dividends on NRCs that bear no relationship to their financial results; this has contributed to a loss of operating capacity and decapitalization of these companies.

¹²⁸ This topic has been the subject of a variety of analyses that go beyond the scope of this report. Readers are referred to Cameron and Stanley (2017, pp. 163-165); Huurdeman and Rozhkova (2019, pp. 85-86); Sunley, Baunsgaard, and Simard (2003, p. 162); and IMF (2012, p. 46).

ANNEX VI: TAX ADMINISTRATION IN LATIN AMERICA AND THE CARIBBEAN

	Taxes	Royalties	Other (bonus payments, surface fees, etc.)
Ecuador	Servicio de Rentas Internas [Internal Revenue Service] (SRI)		
Colombia	Dirección de Impuestos y Aduanas Nacionales [National Tax and Customs Department] (DIAN)	Agencia Nacional de Minería [National Mining Agency] (ANM) Agencia Nacional de Hidrocarburos [National Hydrocarbons Agency] (ANH)	
Mexico	Servicio de Administración Tributaria [Tax Administration Service] (SAT)	Central Bank of Mexico (Fiduciary) - receives payments	
Peru	Superintendencia Nacional de Aduanas y de Administración Tributaria [National Customs and Tax Administration Superintendency] (SUNAT)	Ministry of Economy and Finance (Public Debt and Treasury Department)	
Chile	Servicio de Impuestos Internos [Internal Tax Service] (SII)	Does not apply	National Treasury (TGR)
Brazil	Federal taxes: Ministry of Finance - Receita Federal do Brasil [Brazilian Federal Revenue Service] (RFB) State and municipal taxes: Local authorities	Secretaria do Tesouro Nacional [National Treasury Secretariat] (STN)	
Argentina	Dirección General Impositiva [Tax Administration Department] (DGI) Tesoro General de la Nación [National Treasury]	Provincial tax departments (provincial taxes) Provincial treasuries (royalties)	
Bolivia	Tesoro General de la Nación [National Treasury] (TGN)	Tesoro General de la Nación [National Treasury] (TGN) Departmental and municipal treasuries	
Trinidad and Tobago	Ministry of Finance – Trinidad and Tobago Revenue Authority (TTRA)	Ministry of Energy	
Guyana	Guyana Revenue Authority (GRA)	Guyana Gold Board (GGB) Guyana Geology and Mines Commission (GGMC) Ministry of Finance (2 companies pay directly) Guyana Revenue Authority (GRA)	

Source: Prepared by the authors based on an analysis of regional regulatory frameworks.

ANNEX VII: INTERNATIONAL TRANSPARENCY INITIATIVES

Organisation for Economic Cooperation and Development (OECD). In 2010, the OECD published the Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas. This is aimed at companies that produce or use minerals, and is designed to ensure that they protect human rights and avoid contributing to conflict. It applies to all stages of the production chain in conflict-affected or high-risk areas, and it sets out the procedures that companies should follow.

The United Nations and the OECD. These organizations have developed model tax conventions aimed at avoiding double taxation and encouraging the ratification of bilateral and multilateral tax treaties between countries. Based on these guidelines, the Global Forum on Transparency and Exchange of Information for Tax Purposes has developed a peer review system for national tax systems with a view to reducing offshore tax evasion and reforming international tax rules.

International Monetary Fund. The IMF's Fiscal Transparency Code is the international standard for disclosure of information about public finances and fiscal transparency (IMF, 2019). One of the four pillars of the code, approved in 2018, relates to resource revenue management, stipulating that such management should provide a transparent framework for resource ownership and extraction and the taxation and utilization of associated government revenue. The pillar focuses on 12 transparency principles distributed across four dimensions: resource ownership and rights; resource revenue mobilization; resource revenue utilization; and resource activity disclosure. Fiscal transparency assessments evaluate a country's performance in relation to these principles, with practices that range from bad to advanced.

World Bank Group. The International Finance Corporation's Performance Standards have become a widely-accepted framework among international project financiers for assessing the environmental and social risks of projects in the developing world. More than 60 major international institutions are committed to approving the IFC standards in their project-finance lending under the rubric of the Equator Principles. More recently, the Governance of Extractive Industries (GOXI) platform, created in March 2017, has become a space to share, learn, and connect for action towards greater accountability and, in turn, better development outcomes of extractive industries. For this greater accountability, enhanced transparency is a vital precursor, and hence transparency functions alongside accountability as the core focus of the GOXI. The Extractive Industries Source Book website and the GOXI website are strongly aligned and mutually supporting in terms of content, links, and shared understanding.

The Extractive Industries Transparency Initiative (EITI). This is the most well-known transparency standard in the sector, and is an international standard for transparency in payments and revenue in the extractive sector. The initiative promotes specific measures to improve transparency and accountability in public life, government operations, and business in the extractive sector. It advocates for the publication of reconciled payments by companies and revenues received by governments from oil, gas, and mining exploration and production operations.

Open Budget Index (OBI). The OBI is a global research and advocacy program that works with civil society partners in nearly 100 countries to improve public access to government budget information and to expand accountable and inclusive budgeting practices. The OBI targets specific state revenue management systems combining

research and advocacy and seeks to promote transparent, responsive, and accountable public finance systems.

Resource Governance Index (RGI). The RGI, which is compiled by the Natural Resource Governance Institute (NRGI), identifies publicly available information from official sources regarding government management of the extractive sector and the revenues generated by it, reflecting the relative progress of transparency standards promoted in each country in the survey. The RGI defines transparency as the disclosure of information about natural resources through official sources.

Global Reporting Initiative (GRI). Facilitates the comparison of reporting practices by private organizations on economic, environmental, and social issues. The Mining and Metals Sector Supplement provides sector-specific guidance for the extractive industries.

Kimberley Process. Established in 2003, this was one of the first initiatives to use transparency requirements to trace “blood diamonds” (rough diamonds used by rebel movements to finance armed conflicts aimed at undermining legitimate governments) and to restrict their importation from states in which they were used to support conflict. Its implementation has generated controversy, with differing opinions regarding its effectiveness.

The Publish What You Pay (PWYP) campaign. Established in 2002, PWYP conducts public campaigns and promotes policies to achieve greater transparency in the reporting of revenue from the extractive industries and in industry contracts. Its two key objectives have been (i) to encourage companies to publish what they pay and governments to pay what they receive, as a first needed step toward a more responsible resource revenue management system, and (ii) to promote the public disclosure of extractive industry contracts and transparency in licensing procedures consistent with international best practices.

BIBLIOGRAPHY

- Acerbi, M., Sánchez-triana, E., Enríquez, S., Tiffer-sotomayor, R., Luisa, A., Lima, G., . . . Bank, T. W. (2014). Environmental Impact Assessment Systems in Latin America and the Caribbean. *Environmental Impact Assessment Systems in Latin America and the Caribbean*.
- Addison, T., & Roe, A. R. (September 2018). *Extractive Industries: The Management Of Resources As A Driver Of Sustainable Development*. Oxford University Press. Retrieved from <https://global.oup.com/academic/product/extractive-industries-9780198817369?prevSortField=1&sortField=8&start=0&resultsPerPage=20&prevNumResPerPage=20&lang=en&cc=fi#>.
- Ades, A., & Tella, R. D. (1999). Rents, Competition, and Corruption. *The American Economic Review*, 89, 982–993. Retrieved from <http://www.jstor.org/stable/117169>.
- Afonso, & Hauptmeier, S. (2009). Fiscal behaviour in the European Union: rules, fiscal decentralization and government indebtedness.
- Agalliu, I. (2011). Comparative Assessment of the Federal Oil and Gas Fiscal System. *U.S. Department of the Interior Bureau of Ocean Energy Management*. Retrieved from <https://www.boem.gov/sites/default/files/oil-and-gas-energy-program/Energy-Economics/Fair-Market-Value/CERA-Final-Report-November-2011.pdf>.
- Agosin, M. R., Larraín, C., & Grau, N. (2010). Industrial Policy in Chile. *IDB working paper series*. Retrieved from <https://publications.iadb.org/en/publication/11023/industrial-policy-chile>.
- Agosin, M. R., Urzúa, S., Wagner, R., Trejos, A., de Olloqui, F., Pietrobelli, C., . . . others. (2014). *¿Cómo repensar el desarrollo productivo?: Políticas e instituciones sólidas para la transformación económica*. Inter-American Development Bank.
- Ahmad, E., & Viscarra, H. (2016). Public Investment for Sustainable Development in Chile: Building on the National Investment System. *Inter-American Development Bank Discussion Paper*.
- Aigbodua, J., & Oisamoje, M. (2013). Promoting small and medium enterprises in the Nigerian oil and gas industry. *European Scientific Journal*.
- Alba, E. M. (2009). Extractive Industries Value Chain. *Extractive Industries for Development Series*, 3.
- Alesina, A., Tabellini, G., & Campante, F. R. (2008). Why Is Fiscal Policy Often Procyclical? *Journal of the European Economic Association*, 6, 1006–1036. Retrieved from <http://www.jstor.org/stable/40283091>.
- Alianza Valor Minero (AVM). (2018). Análisis Estratégico de Sostenibilidad Territorial (AESOT): Un instrumento clave para la inserción de los grandes proyectos en los territorios. Retrieved from http://www.valorminero.cl/site/wp-content/uploads/2018/06/Analisis-Estrategico-de-Sostenibilidad-Territorial_herramienta-clave_PDF.pdf.
- Alianza Valor Minero (AVM). (2020). Análisis Estratégico de Sostenibilidad Territorial. *Inter-American Development Bank, Washington, D.C.*
- Alianza Valor Minero (AVM). (en prensa). Análisis Estratégico Territorial para Proyectos de Inversión. Guía de Orientación. *Inter-American Development Bank, Washington D.C.*

- Al-Kasim, F. (2006). *Managing petroleum resources: the "Norwegian model" in a broad perspective* (Vol. 30). Oxford Institute for Energy Studies.
- Altomonte, H., & Sánchez, R. (2016). *Hacia una nueva gobernanza de los recursos naturales en América Latina y el Caribe*. Santiago, Chile: Economic Commission for Latin America and the Caribbean.
- Álvarez, R., Benavente, J. M., & Crespi, G. (December 2019). *Innovation in the Global Economy: Opening-Up Latin American Innovation Systems*. Inter-American Development Bank. doi:10.18235/0002044.
- Allen, M., & Caruana, J. (2008). Sovereign wealth funds – A work agenda. *International Monetary Fund*. Retrieved from <https://www.imf.org/external/np/pp/eng/2008/.pdf>.
- Anderson, J., De Smet, D., Ghossein, T., Penfold, M., Puget, S., Primiani, T., & De La Medina Soto, C. (2014). N° 14. *Regulación de la inversión extranjera directa en América Latina. Regulaciones y opciones para reformas al clima de inversión*. Tech. rep., Serie Políticas Públicas y Transformación Productiva, 14, Caracas: IFC. Retrieved from <http://scioteca.caf.com/handle/123456789/377>.
- Andreula, N., Chong, A., & Guillén, J. (2009). Institutional Quality and Fiscal Transparency. *SSRN Electronic Journal*. doi:10.2139/ssrn.1817228
- Arbeláez, M. A., & Parra, V. (2020). Industrias Extractivas. *Informe Final. Fedesarrollo*.
- Arcos, A., & Rivera, E. (2018). Brechas de género en la minería: La minería artesanal y de pequeña escala colombiana desde una perspectiva de género. *Serie sobre la MAPE responsable*, 12, 1–328.
- Arcos, A., & Rivera, E. (2018). Brechas de género en la minería: La minería artesanal y de pequeña escala colombiana desde una perspectiva de género. *Serie sobre la MAPE responsable*, 12, 1–328.
- Ardanaz, M., & Maldonado, S. (May 2016). *Natural Resource Windfalls and Efficiency of Local Government Expenditures: Evidence from Peru*. Documentos de Trabajo, Universidad del Rosario. Retrieved from <https://ideas.repec.org/p/col/000092/.html>.
- Ardanaz, M., Barreix, A., Corrales, L. F., & de Sarralde, S. D. (2019). Reglas fiscales resilientes en América Latina. In A. Barreix, & L. F. Corrales (Edits.). Inter-American Development Bank.
- Arfaa, N., Tordo, S., & Tracy, B. S. (2011). National oil companies and value creation (English). *World Bank working paper; no. 218*. Washington, D.C.: World Bank. Retrieved from <http://documents.worldbank.org/curated/en/650771468331276655/oil-companies-and-value-creation>.
- Arisi, D., & González, A. C. (2015). La transparencia en la gestión de los ingresos de las industrias extractivas: el caso de Colombia. *Gobernanza con transparencia en tiempos de abundancia: experiencias de las industrias extractivistas en América Latina y el Caribe*, 303–346.
- Arisi, D., Cortés, A., & Cruz, J. (2017). Colombia 2030: mejorando la gestión del sector minero energético. *Technical Note IDB-TN-1321*, Inter-American Development Bank.
- Armendáriz, E., Contreras, E., Orozco, S., & Parra, G. (2016). La eficiencia del gasto de inversión pública en América Latina. *XXI Congreso Internacional del CLAD sobre la Reforma del Estado y de la Administración Pública*. Santiago, Chile, (págs. 8–11).

- Arrobas, D. L., Hund, K. L., McCormick, M. S., Ningthoujam, J., & Drexhage, J. R. (2017). *The Growing Role of Minerals and Metals for a Low Carbon Future* (English). Washington, D.C.: World Bank Group. *The Growing Role of Minerals and Metals for a Low Carbon Future* (English). Washington, D.C.: World Bank Group.
- Avellan, L., & Vuletin, G. (2015). Fiscal procyclicality and output forecast errors. *Journal of International Money and Finance*, 55, 193-204. Retrieved from <https://EconPapers.repec.org/RePEc:eee:jimfin:v:55:y:2015:i:c:p:193-204>.
- Baca, E. (2017). *La Agenda de la Sociedad Civil frente a las Industrias Extractivas en Perú*. (G. P. Ciudadana, Ed.) Natural Resource Governance Institute. Retrieved from <http://redextractivas.org/wp-content/uploads/2017/08/Reporte-Peru.pdf>.
- Badinger, H., & Reuter, W. H. (January 2017). The case for fiscal rules. *Economic Modelling*, 60, 334–343. doi:10.1016/j.econmod.2016.09.028
- Balza, L. H., & Espinasa, R. (2015). *Oil Sector Performance and Institutions: The Case of Latin America*. Tech. rep., Inter-American Development Bank. Retrieved from <https://publications.iadb.org/publications/english/document/Oil-Sector-Performance-and-Institutions-The-Case-of-Latin-America.pdf>.
- Balza, L., & Espinasa, R. (2018). The Economics of Natural Resources in Latin America: Taxation and Regulation of the Extractive Industries. In O. Manzano, F. Navajas, & A. Powell (Edits.). Routledge.
- Balza, L., & Manzano, O. (2013). Productivity spillover of resource exploitation: Evidence from Venezuelan industrial surveys. *Washington, D.C.: BID*.
- Balza, L., Espinasa, R., & Jimenez, R. (2014). Transparent Governance in an Age of Abundance: Experiences from The Extractives Industries in Latin American and The Caribbean. In J. Vieyra, & M. Masson (Edits.). Inter-American Development Bank, Washington D.C.
- Ballón, E., Viale, C., Monge, C., Patzy, F., & de la Puente, L. (2017). *La Nueva Agenda de la Sociedad Civil frente a las Industrias Extractivas en América Latina después del Súper Ciclo y la Carrera Hacia el Fondo*. (R. L. sobre las Industrias Extractivas, Ed.) Natural Resource Governance Institute. Retrieved from <http://redextractivas.org/wp-content/uploads/2017/08/Reporte-Regional.pdf>.
- Bamber, P., & Fernandez-Stark, K. (2020). Innovation and Competitiveness in the Copper Mining GVC: Developing Local Suppliers in Peru. *Internal document. Inter-American Development Bank*.
- Barma, N. H., Kaiser, K., Minh Le, T., & Vinuela, L. (2011). Rents to riches? The political economy of natural resource-led development (English). *Washington, D.C.: World Bank*. Retrieved from <http://documents.worldbank.org/curated/en/545221468150583397/to-riches-The-political-economy-of-natural-resource-led-development>.
- Barómetro Global de la Corrupción - América Latina y el Caribe 2019. (s.f.). *Barómetro Global de la Corrupción - América Latina y el Caribe 2019*. Retrieved from https://files.transparency.org/content/download/2402/14630/file/2019_GCB_ALC_Report_ES.pdf.
- Barreix, A. D., Corrales, L. F., Benitez, J. C., Garcimartín, C., Ardanaz, M., Díaz, S., . . . others. (2019). *Reglas fiscales resilientes en América Latina* (Vol. 767). Inter-American Development Bank.

- Bazilian, M., Onyeji, I., Aqrawi, P.-K., Sovacool, B. K., Ofori, E., Kammen, D. M., & de Graaf, T. V. (February 2013). Oil, Energy Poverty and Resource Dependence in West Africa. *Journal of Energy & Natural Resources Law*, 31, 33-53. doi:10.1080/02646811..11435316
- Beetsma, R. M., Debrun, X., Fang, X., Kim, Y., Lledo, V. D., Mbaye, S., & Zhang, X. (2018). *Independent Fiscal Councils : Recent Trends and Performance*. Washington, D.C: International Monetary Fund.
- Benavente, J. M., & Grazzi, M. (2017). Public Policies for Creativity and Innovation: Promoting the Orange Economy in Latin America and the Caribbean.
- Bergman, U. M., Hutchison, M. M., & Jensen, S. E. (September 2016). Promoting sustainable public finances in the European Union: The role of fiscal rules and government efficiency. *European Journal of Political Economy*, 44, 1–19. doi:10.1016/j.ejpoleco.2016.04.005.
- Bhattacharya, A., Romani, M., & Stern, N. (2012). Infrastructure for development: meeting the challenge. *CCCEP, Grantham Research Institute on Climate Change and the Environment and G*, 24.
- Bhattacharyya, S., & Hodler, R. (May 2010). Natural resources, democracy and corruption. *European Economic Review*, 54, 608–621. doi:10.1016/j.euroecorev.2009.10.004.
- Binsted, M., Iyer, G., Edmonds, J. A., Vogt-Schilb, A., Arguello, R., Cadena, A., . . . Miralles-Wilhelm, F. (August 2019). *Stranded Asset Implications of the Paris Agreement in Latin America and the Caribbean*. Inter-American Development Bank. doi:10.18235/0001803.
- Blöchliger, H. (2013). *Fiscal federalism 2014 : making decentralisation work*. Paris: OECD.
- BNamericas. (2020). Los Actores del Presente y Futuro del Mercado de Litio. Retrieved from <https://app.bnamericas.com/report/pdf/xjuattxiv-lithium>.
- Bohn, H., & Inman, R. P. (1996). Balanced-budget rules and public deficits: evidence from the US states. *Carnegie-Rochester conference series on public policy*, 45, págs. 13–76.
- Borensztein, E., Jeanne, O., & Sandri, D. (March 2013). Macro-hedging for commodity exporters. *Journal of Development Economics*, 101, 105–116. doi:10.1016/j.jdeveco.2012.08.005.
- Boschini, A. D., Pettersson, J., & Roine, J. (September 2007). Resource Curse or Not: A Question of Appropriability. *Scandinavian Journal of Economics*, 109, 593–617. doi:10.1111/j.1467-9442.2007.00509.x.
- Bova, E., Medas, P., & Poghosyan, T. (2016). Macroeconomic Stability in Resource-Rich Countries: The Role of Fiscal Policy. *IMF Working Papers*, 16, 1. doi:10.5089/9781475596465.001
- Bravo, V. (2015). Análisis de la Ley 27007, llamada de hidrocarburos, y de la política hidrocarburífera del periodo 2003 a 2014. *Working document, Bariloche, Fundación Bariloche-CONICET, enero*.
- Bulte, E. H., Damania, R., & Deacon, R. T. (July 2005). Resource intensity, institutions, and development. *World Development*, 33, 1029-1044. Retrieved from <https://ideas.repec.org/a/eee/wdevel/v33y2005i7p1029-1044.html>.

- Calder, J. (2014). *Administering Fiscal Regimes for Extractive Industries*. Washington: International Monetary Fund. Retrieved from <https://www.elibrary.imf.org/view//20884-9781475575170/20884-9781475575170/20884-9781475575170.xml?en>.
- Calderon, C., & Servén, L. (June 2010). *Infrastructure In Latin America*. The World Bank. doi:10.1596/1813-9450-5317
- Cameron, P. (2010). *International energy investment law : the pursuit of stability*. Oxford New York, N.Y: Oxford University Press.
- Cameron, P. D., & Stanley, M. C. (June 2017). *Oil, Gas, and Mining: A Sourcebook for Understanding the Extractive Industries*. The World Bank. doi:10.1596/978-0-8213-9658-2.
- Campodónico, H. (2004). Reformas e inversión en la industria de hidrocarburos de América Latina, serie Recursos Naturales e Infraestructura. Santiago, Chile: *Economic Commission for Latin America and the Caribbean (ECLAC)*.
- Campodónico, H. (2015). Towards Full Recognition of Tenure Rights in Latin America: Challenges and Opportunities in the Context of Colombia and Peru as New Emerging Economies. *paper presented at the 2015 Bern Conference: From Rhetoric to Action: Scaling Up Community and Indigenous Peoples' Land and Resource Rights*. 1 October.
- Canadian Intergovernmental Working Group on the Mineral Industry. (2001).
- Cao Romero, A. J. (2016). Las perspectivas de PEMEX después de la Reforma Energética: El desempeño operativo y financiero de PEMEX y PEMEX exploración y producción. *Foro energético. Programa de Energía del Colegio de México*.
- Carbon Tracker Initiative (CTI). (2019). Breaking the Habit – Why None of the Large Oil Companies Are “Paris-Aligned”, and What They Need to Do to Get There. *Carbon Tracker Initiative*.
- Cárdenas, J. A., Arcos, A., & Echavarría, E. (2017). Seguridad y salud en la pequeña minería colombiana. *Seguridad y salud en la pequeña minería colombiana*. Envigado: Alianza por la Minería Responsable.
- Carlier, A. (2018). Diagnóstico institucional sobre la igualdad de género y diversidad étnica en los procesos de gestión del Ministerio de Minas y Energía de Colombia: resultados y recomendaciones. *Colombia: CIRD y BID*.
- Caselli, F. G., & Reynaud, J. (2019). *Do fiscal rules cause better fiscal balances? : a new instrumental variable strategy*. Place of publication not identified: International Monetary Fund.
- Cavallo, E. A., Izquierdo, A., Puig, J., & Ardanaz, M. (May 2020). *Growth-friendly Fiscal Rules?: Safeguarding Public Investment from Budget Cuts through Fiscal Rule Design*. IDB Publications (Working Papers), Inter-American Development Bank. Retrieved from <https://ideas.repec.org/p/idd/briaps/10159.html>.
- Clemens, J., & Miran, S. (May 2012). Fiscal Policy Multipliers on Subnational Government Spending. *American Economic Journal: Economic Policy*, 4, 46–68. doi:10.1257/pol.4.2.46.
- Climate Policy Initiative (CPI). (2014). Moving to a Low-Carbon Economy: The Financial Impact of the Low-Carbon Transition. *CPI Energy Transition Series*. October 2014.

- Coady, D., Parry, I. W., Sears, L., & Shang, B. (2015). *How large are global energy subsidies?* International Monetary Fund.
- Coady, D., Parry, I., Le, N.-P., Shang, B., & others. (2019). Global fossil fuel subsidies remain large: an update based on country-level estimates. *IMF Working Papers*, 19, 39.
- Columbia Center on Sustainable Investment (CCSI). (2016). Linkages to the Resource Sector: The Role of Companies, Government and International Development Cooperation. *German Federal Ministry for Economic Cooperation and Development (BMZ)*.
- Collier, P., & Hoeffler, A. (April 2009). Testing the neocon agenda: Democracy in resource-rich societies. *European Economic Review*, 53, 293–308. doi:10.1016/j.euroecorev.2008.05.006.
- Convention on Biological Diversity (CBD). (2018). Mainstreamings of Biodiversity in the Energy and Mining Sector. *Subsidiary Body on Implementation, Second Meeting, Montreal, Canada*. Retrieved from <https://www.cbd.int/doc/c/278a/e222/7deeb28863c875885315/sbi-02-04-add3-en.pdf>.
- Corneau, S. (2019). How Can Technology in Mining Protect the Environment? *International Institute for Sustainable Development*. Retrieved from <https://www.iisd.org/how-can-technology-mining-protect-environment>.
- Corral, L. R., Schling, M., & Montiel, C. (2018). *The economic and ecological impact of natural resource extraction: The case of the Camisea Gas Project in Peru*. Tech. rep., IDB Working Paper Series.
- Corral, L., Henderson, H., & Miranda, J. J. (2019). The Fiscal Impact of Natural Resource Windfalls: Evidence from a Peruvian Natural Experiment. *Land Economics*, 95, 577-598.
- Cotula, L. (2010). *Investment contracts and sustainable development : how to make contracts for fairer and more sustainable natural resource investments*. London: International Institute for Environment and Development.
- Crespi, G., Garone, L. F., Maffioli, A., & Stein, E. H. (2019). *Innovation, productivity, and spillovers effects: Evidence from Chile*. Tech. rep., IDB Working Paper Series.
- Cuadros, A. (2016). *Brazillionaires: The godfathers of modern Brazil*. Profile Books.
- Chambers, D., Dimson, E., & Ilmanen, A. (2012). The Norway Model. *The Journal of Portfolio Management*, 38, 67–81. doi:10.3905/jpm.2012.38.2.067.
- Chang, H.-J. (2007). *Institutional change and economic development*. New, York, NY: United Nations University Press.
- Chen, A. (2019). Where Will the Materials for Our Clean Energy Future Come From? *The Verge*. Retrieved from <https://www.theverge.com/2019/2/15/18226210/energy-renewables-materials-mining-environment-neodymium-copper-lithium-cobalt>.
- Christev, & Esanov, A. (November 2018). The Economics of Natural Resources in Latin America: Taxation and Regulation of the Extractive Industries. In M. Osmel E. Manzano, F. H. Navajas, & A. Powell (Edits.). Taylor and Francis. doi:10.4324/9781315111377.
- Dabla-Norris, E., Brumby, J., Kyobe, A., Mills, Z., & Papageorgiou, C. (2012). Investing in public investment: an index of public investment efficiency. *Journal of Economic Growth*, 17, 235–266.

- Daniel, P., Keen, M., & McPherson, C. (2010). *The taxation of petroleum and minerals: principles, problems and practice*. Routledge.
- Daniel, P., Keen, M., & McPherson, C. (2010). *The taxation of petroleum and minerals: principles, problems and practice*. Routledge.
- Dassen, N., Vieyra, J. C., Molina, E., Ramírez Alujas, Á. V., Díaz Frers, L., Elena, S., . . . Riaño, J. (2012). *Open Government and Targeted Transparency: Trends and Challenges for Latin America and the Caribbean*. (N. Dassen, & J. C. Vieyra, Edits.) Inter-American Development Bank.
- de la Fuente, A., & Olivera, B. (2017). *La Agenda de la Sociedad Civil frente a las Industrias Extractivas en México*. (C. d. Fundar, Ed.) Natural Resource Governance Institute. Retrieved from <http://redextractivas.org/wp-content/uploads/2017/08/Reporte-Mexico.pdf>.
- de la Fuente, G. (2014). El derecho de acceso a la información pública en América Latina y los países de la RTA: Avances y desafíos de la política. *Revista transparencia & sociedad*, 27-51.
- de Michele, R., & Barreix, A. (2019). Transparencia fiscal: El hilo invisible entre la evasión de impuestos y el crimen organizado. *blog de la División de Innovaciones para Servir al Ciudadano del BID*. Retrieved from <https://blogs.iadb.org/administracion-publica/es/transparencia-fiscal-tirando-del-hilo-entre-la-evasion-de-impuestos-y-el-crimen-transnacional/>.
- de Sa, P., & Espinasa, R. (December 2018). *Good Practices in Mineral Resource Management*. Inter-American Development Bank. doi:10.18235/0001552.
- Debrun, X., Moulin, L., Turrini, A., i-Casals, J. A., & Kumar, M. S. (April 2008). Tied to the mast? National fiscal rules in the European Union. *Economic Policy*, 23, 297–362. doi:10.1111/j.1468-0327.2008.00199.x.
- Deloitte. (2014). *Guide to investing in the oil & gas industry in Australia*. Tech. rep., Baker & McKenzie International.
- Deloitte. (2019). 2018 Mining Charter Analysis. Finding a Happy Medium. *Johannesburg: Deloitte Global*.
- Demaestri, E., & Moskovits, C. (2015). Pasivos contingentes soberanos. *Inter-American Development Bank, Washington D.C.*
- Dessus, S. (2011). The challenges and opportunities of Ghana's offshore oil discovery. *The World Bank*. Retrieved from <http://siteresources.worldbank.org/INTAFRREGTOPTRADE/Resources/14GhanaOilpolicynoteREVISED.pdf>.
- Dietsche, E. (August 2017). New industrial policy and the extractive industries. 2017. doi:https://doi.org/10.35188/UNU-WIDER/2017/387-5.
- Difiglio, C. (December 2014). Oil, economic growth and strategic petroleum stocks. *Energy Strategy Reviews*, 5, 48–58. doi:10.1016/j.esr.2014.10.004.
- Dixon, A. D., & Monk, A. H. (25 October 2011). What role for sovereign wealth funds in Africa's development? *What role for sovereign wealth funds in Africa's development?* Center for Global Development, Washington, D.C.

- Djankov, S., McLiesh, C., & Ramalho, R. M. (2006). Regulation and growth. *Economics Letters*, 92, 395-401. Retrieved from <https://EconPapers.repec.org/RePEc:eee:ecolett:92:y:2006:i:3:p:395-401>.
- Dobbs, R., Oppenheim, J., Kendall, A., Thompson, F., Bratt, M., & van der Mare, F. (December 2013). *Reverse the curse: Maximizing the potential of resource-driven economies*. Tech. rep., McKinsey Global Institute.
- Donahue, M. (2000). *Concept Paper for Bank Support to Pre-qualification of Oil and Gas Exploration/production Blocks Andean/Amazon Basin Countries*. Inter-American Development Bank, Sustainable Development Department. Retrieved from <https://publications.iadb.org/en/concept-paper-bank-support-pre-qualification-oil-and-gas-explorationproduction-blocks-andeanamazon>.
- Duval, H. L., & Blinn, K. W. (2009). *International petroleum exploration and exploitation agreements : legal, economic & policy aspects. Second Edition*. New York: New York: Barrows.
- ECLAC, U.N., & others. (2016). Environmental Performance Reviews. Peru 2016: Highlights and recommendations.
- Economic Commission for Latin America and the Caribbean (ECLAC). (2013). *Recursos naturales: situación y tendencias para una agenda de desarrollo regional en América Latina y el Caribe*. ECLAC.
- Echavarría, E., & González, N. (2016). La formalización de la pequeña minería en Colombia: experiencias desde el territorio. *Serie sobre la MAPE Responsable*, 9. Retrieved from <http://www.responsiblemines.org/wp-content/uploads/2017/06/Formalizacion-Somos-Tesoro.pdf>.
- Eisen, N., Kaufmann, D., Heller, N., Whitt, J. P., Picon, M., Bassetti, V., & Hudak, J. (2020). The TAP-Plus approach to anti-corruption in the natural resource value chain. *Brookings*. Retrieved from https://www.brookings.edu/wp-content/uploads/2020/06/Corruption_vfinal_x2screenreader4.pdf.
- El-Gamal, M. A., & Jaffe, A. M. (2018). The coupled cycles of geopolitics and oil prices. *Economics of Energy & Environmental Policy*, 7, 1–15.
- ELLA. (2013). Mejorar la Gestión Ambiental en el Sector Extractivo a través de la Evaluación de Impacto Ambiental. *Resumen de Políticas. Evidencias y Lecciones desde América Latina*. Retrieved from <http://tinyurl.com/o9oqtlb>.
- Engel, E., Rubio, D. F., Kaufmann, D., Yaffar, A. L., Saldarriaga, J. L., Noveck, B. S., . . . Rose-Ackerman, S. (November 2018). Report of the Expert Advisory Group on Anti-Corruption, Transparency, and Integrity in Latin America and the Caribbean. doi:http://dx.doi.org/10.18235/00001419.
- Equipo Marco Interinstitucional para la Acción Preventiva de las Naciones Unidas Unión Europea (UN and EU). (2012). Kit de herramientas y orientación para la prevención y la gestión de conflictos de tierras y recursos naturales: Introducción y descripción general. Retrieved from <http://repositorio.dpe.gob.ec/handle/39000/2213>.
- Ernst & Young. (2014). Managing bribery and corruption sector risk in the Oil and Gas Industry. Retrieved from <https://www.ey.com/Publication/vwLUAssets/EY-Managing-bribery-and-corruption-risk-in-the-oil-and-gas-industry/FILE/EY-Managing-bribery-and-corruption-risk-in-the-oil-and-gas-industry.pdf>.

- Espinasa, R., Medina, R., & Tarre, G. (November 2016). *La ley y los hidrocarburos: Comparación de marcos legales de América Latina y el Caribe*. (C. Sucre, Ed.) Inter-American Development Bank. Retrieved from <https://publications.iadb.org/publications/document/La-ley-y-los-hidrocarburos-Comparación-de-marcos-legales-de-América-Latina-y-el-Caribe.pdf>.
- Espinoza, G. (2002). *Gestión y Fundamentos de Evaluación ambiental*. Inter-American Development Bank (IDB), Centro de Estudios para el Desarrollo (CED). Santiago de Chile.
- Esteves, A. M., Coyne, B., & Moreno, A. (2013). Iniciativas sobre contenido local: mejorar los beneficios subnacionales de los sectores petrolero, gasífero y minero. *Revenue Watch Institute*. Recuperado de www.revenuewatch.org.
- Extractive Industries Transparency Initiative (EITI). (2016). *El Estándar EITI 2016*. Tech. rep., Extractive Industries Transparency Initiative (EITI). Retrieved from https://eiti.org/files/documents/a4_spanish_standard_web.pdf.
- Extractive Industries Transparency Initiative (EITI). (2018). EITI and Gender Equality. *EITI*. Retrieved from https://eiti.org/files/documents/eiti_brief_gender_equality_1.pdf.
- Extractive Industries Transparency Initiative (EITI). (2018). Panning for data Artisanal and small-scale mining (ASM) in EITI countries. Retrieved from <https://eiti.org/document/for-data>.
- Extractive Industries Transparency Initiative (EITI). (2019). *EITI Progress Report 2019*. Tech. rep., Extractive Industries Transparency Initiative. Retrieved from <https://eiti.org/eiti-progress-report-2019>.
- Extractive Industries Transparency Initiative (EITI). (2019). *El Estándar EITI 2019*. Tech. rep., Extractive Industries Transparency Initiative (EITI). Retrieved from https://eiti.org/documents/eiti_standard2019_a4_es.pdf.
- Fernández, L. V. (2017). *Minería y derechos de los pueblos indígenas en América Latina: la disputa por el territorio en Raposa Serra do Sol*. Universidad Complutense de Madrid.
- Financial Action Task Force (FATF). (2012). Las recomendaciones del GAFI. Retrieved from <http://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF-40-Rec-2012-Spanish.pdf>.
- Finer, M., Jenkins, C. N., Pimm, S. L., Keane, B., & Ross, C. (August 2008). Oil and Gas Projects in the Western Amazon: Threats to Wilderness, Biodiversity, and Indigenous Peoples. (D. M. Hansen, Ed.) *PLoS ONE*, 3, e2932. doi:10.1371/journal.pone.0002932.
- Fiscal Monitor. (2015). *Now is the time : fiscal policies for sustainable growth*. Washington, D.C.: International Monetary Fund.
- Fiscal Monitor. (2019). *Curbing Corruption*. International Monetary Fund.
- Fischer, D., & Baron, R. (2015). Divestment and Stranded Assets in the Low-carbon Transition. In *OECD Background Paper for the 32nd Round Table on Sustainable Development*. OECD Paris.
- Flórez, M. (2013). Impacto de las Industrias Extractivas en los Derechos Colectivos sobre Territorios y Bosques de los Pueblos y las Comunidades. *Impacto de las Industrias Extractivas en los Derechos Colectivos sobre Territorios y Bosques de los Pueblos y las Comunidades*. Rights and Resources Initiative, Asociación Ambiente y Sociedad.

- Florini, A. (2007). *The right to know : transparency for an open world*. New York: Columbia University Press.
- Frankel, J. (August 2013). A Solution to Fiscal Procyclicality: The Structural Budget Institutions Pioneered by Chile. In L. F. Céspedes, & J. Galí (Edits.), *Fiscal Policy and Macroeconomic Performance* (Vol. 17, págs. 323-391). Central Bank of Chile. Retrieved from <https://ideas.repec.org/h/chb/bcchsb/v17c09pp323-391.html>.
- Frankel, J. A., Vegh, C. A., & Vuletin, G. (January 2013). On graduation from fiscal procyclicality. *Journal of Development Economics*, 100, 32–47. doi:10.1016/j.jdeveco.2012.07.001.
- Fung, A., Graham, M., & Weil, D. (2007). *Full disclosure: The perils and promise of transparency*. Cambridge University Press.
- Garcia, L. C., Ribeiro, D. B., de Oliveira Roque, F., Ochoa-Quintero, J. M., & Laurance, W. F. (January 2017). Brazil's worst mining disaster: Corporations must be compelled to pay the actual environmental costs. *Ecological Applications*, 27, 5–9. doi:10.1002/eap.1461.
- Gillula, J., Fullenbaum, R., & Winkel, R. (2016). Minority and Female Employment in the Oil & Natural Gas and Petrochemical Industries, 2015-2035. *American Petroleum Institute*.
- González-Mahecha, E., Lecuyer, O., Hallack, M., Bazilian, M., & Vogt-Schilb, A. (September 2019). *Committed Emissions and the Risk of Stranded Assets from Power Plants in Latin America and the Caribbean*. Inter-American Development Bank. doi:10.18235/0001827.
- Grice, T. (2018). Local Content Policies: Stimulating Direct Local Employment. *Canada: International Institute for Sustainable Development*.
- Group, G. L. (2018). *The International Comparative Legal Guide to: Oil & Gas Regulation 2018*.
- Guillén, M. (2017). Five ways technology will change the mining, oil and gas industries. *World Economic Forum*. Retrieved from <https://www.weforum.org/agenda/2017/05/five-ways-in-which-technology-will-change-the-extractive-industries/>.
- Guimón, J., Chaminade, C., Maggi, C., & Salazar-Elena, J. C. (June 2018). Policies to Attract R&D-related FDI in Small Emerging Countries: Aligning Incentives With Local Linkages and Absorptive Capacities in Chile. *Journal of International Management*, 24, 165–178. doi:10.1016/j.intman.2017.09.005.
- Gutiérrez, J. I., Acevedo, W. J., & Torres, J. O. (2017). FISCALIZACIÓN DE LA MINERÍA EN COLOMBIA. *Contraloría General de la república de Colombia - Dirección de Estudios Sectoriales*.
- Hale, T. N. (2008). Transparency, accountability, and global governance. *Global Governance: A Review of Multilateralism and International Organizations*, 14, 73–94.
- Halland, H., Lokanc, M., & Nair, A. (March 2016). *El sector de las industrias extractivas: Aspectos esenciales para economistas, profesionales de las finanzas públicas y responsables de políticas*. Washington, D.C: The World Bank. doi:https://doi.org/10.1596/978-1-4648-0612-4.
- Hardoon, D., & Heinrich, F. (2011). *Bribe payers index 2011*. Berlin: Transparency International.

- Hartley, P. R., & Kenneth B. Medlock, I. I. (April 2013). Changes in the Operational Efficiency of National Oil Companies. *The Energy Journal*, 34. doi:10.5547/01956574.34.2.2.
- Hashim, A., & Piatti-Fünfkirchen, M. (2018). *Lessons from reforming financial management information systems: a review of the evidence*. The World Bank.
- Havro, G., & Santiso, J. (September 2008). To Benefit from Plenty: Lessons from Chile and Norway. *To Benefit from Plenty: Lessons from Chile and Norway*. Organisation for Economic Co-Operation and Development (OECD). doi:10.1787/238030862800.
- Heinemann, F., Moessinger, M.-D., & Yeter, M. (January 2018). Do fiscal rules constrain fiscal policy? A meta-regression-analysis. *European Journal of Political Economy*, 51, 69–92. doi:10.1016/j.ejpoleco.2017.03.008.
- Hellman, J. S., Jones, G., & Kaufmann, D. (2000). *Seize the state, seize the day: State capture, corruption, and influence in transition*. The World Bank. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=240555.
- Hemming, R. (2013). The macroeconomic framework for managing public finances. In *The International Handbook of Public Financial Management* (págs. 17–37). Springer.
- Hemming, R. (2013). The Role of Independent Fiscal Agencies. In *The International Handbook of Public Financial Management* (págs. 837–850). Palgrave Macmillan UK. doi:10.1057/9781137315304_39.
- Hernández Trillo, F. (2015). *Federalismo ambiental en América Latina: una revisión*. Tech. rep., Economic Commission for Latin America and the Caribbean (ECLAC).
- Herrera, J. J. (2017). *La Agenda de la Sociedad Civil frente a las Industrias Extractivas en Ecuador*. (F. A. Grupo, Ed.) Natural Resource Governance Institute. Retrieved from <http://redextractivas.org/wp-content/uploads/2017/08/Reporte-Ecuador.pdf>.
- Herrera, J. J., Morales, M., & Jarrín, S. (2016). Marcos de Contenido Local en los sectores de Petróleo y Gas en América Latina: Lecciones de Ecuador y Colombia. *Serie Documentos de Investigación. Evidencias y Lecciones desde América Latina*.
- Heum, P. (2008). Local content development: experiences from oil and gas activities in Norway. Retrieved from <http://hdl.handle.net/11250/166156>.
- Hidróñ, C., & Koepke, R. (2014). Abordando el Trabajo Forzoso en la Minería Artesanal y de Pequeña Escala (MAPE) Guía de Herramientas para Capacitadores. *Centro de Capacitación de ARM - Solidaridad - Humanity United*.
- Hilson, G. (July 2000). Barriers to implementing cleaner technologies and cleaner production (CP) practices in the mining industry: A case study of the Americas. *Minerals Engineering*, 13, 699–717. doi:10.1016/s0892-6875(00)00055-8.
- Hosseini, S. E. (October 2020). An outlook on the global development of renewable and sustainable energy at the time of COVID-19. *Energy Research & Social Science*, 68, 101633. doi:10.1016/j.erss.2020.101633.
- Hund, K., Porta, D. L., Fabregas, T. P., Laing, T., & Drexhage, J. (2020). Minerals for Climate Action: The Mineral Intensity of the Clean Energy Transition. *The World Bank*. Retrieved from <http://pubdocs.worldbank.org/en/961711588875536384/Minerals-for-Climate-Action-The-Mineral-Intensity-of-the-Clean-Energy-Transition.pdf>.
- IDB and DDPLAC. (December 2019). *Cómo llegar a cero emisiones netas: Lecciones de América Latina y el Caribe*. Inter-American Development Bank. doi:10.18235/0002024.

- Ilizetzki, E., Mendoza, E. G., & Végh, C. A. (March 2013). How big (small?) are fiscal multipliers? *Journal of Monetary Economics*, 60, 239–254. doi:10.1016/j.jmoneco.2012.10.011.
- Inodú. (2018). Estudio de Alternativas Tecnológicas al Retiro y/o Reconversión de las Unidades de Carbón en Chile. *Informe – Licitación No. 83296674*.
- Instituto Geológico Minero Y Metalúrgico (INGEMMET). (2005). Minería a pequeña escala en la costa sur media del Perú. *Lima: Instituto Geológico Minero y Metalúrgico. Boletín No. 3, Serie E: Minera*.
- Inter-American Development Bank (IDB) and Organization for Economic Cooperation and Development (OECD). (March 2019). *A Beneficial Ownership Implementation Toolkit*. Inter-American Development Bank. doi:http://dx.doi.org/10.18235/0001711.
- Inter-American Development Bank (IDB). (2012). Leveraging Opportunities for Sustaining Growth: IDB Biodiversity Platform for Latin America and the Caribbean. Retrieved from [https://idbg.sharepoint.com/teams/EZ-BK-CIP/BK-C1097/80_IDBDocs_Legacy/050_IDBDocs_Unclassified/Leveraging Opportunities for Sustaining Growth IDB Biodiversity Platform for Latin America and the Caribbean,Ap \[36930850\].PDF](https://idbg.sharepoint.com/teams/EZ-BK-CIP/BK-C1097/80_IDBDocs_Legacy/050_IDBDocs_Unclassified/Leveraging%20Opportunities%20for%20Sustaining%20Growth_IDB%20Biodiversity%20Platform%20for%20Latin%20America%20and%20the%20Caribbean,Ap%2036930850.PDF)
- Inter-American Development Bank (IDB). (2013). Muy lejos para exportar: Los costos internos de transporte y las disparidades en las exportaciones regionales en América Latina y el Caribe. *Inter-American Development Bank*.
- Inter-American Development Bank (IDB). (2016). Emerging and Sustainable Cities Initiative Methodological Guide. *Inter-American Development Bank, Washington D.C.*
- Inter-American Development Bank (IDB). (2016). Urban Development and Housing Sector Framework Document (GN-2732-6).
- Inter-American Development Bank (IDB). (2017). Citizen Security and Justice Sector Framework Document (GN-2771-7).
- Inter-American Development Bank (IDB). (2017). Water and Sanitation Sector Framework Document (GN-2781-8).
- Inter-American Development Bank (IDB). (2019). Extractive Industries Sector Framework Document. Infrastructure and Energy Division. Unpublished.
- Inter-American Development Bank (IDB). (2019). Integration and Trade Sector Framework Document (GN-2715-11).
- Inter-American Development Bank (IDB). (2020). Hacia una nueva Visión Compartida sobre el Sector Extractivo y su rol en el desarrollo sostenible de America Latina y el Caribe. *Washington, D.C.: Inter-American Development Bank*.
- Inter-American Development Bank (IDB). (2020). Transparency and Integrity Sector Framework Document (GN-2981-2).
- International Commission of Jurists (ICJ). (March 2016). Industrias extractivas, Derechos Humanos y conflictos sociales en Perú. Retrieved from <https://www.refworld.org/es/57f795aec.html>.
- International Energy Agency (IEA). (2019). World Energy Investment. *World Energy Investment*. Retrieved from <https://www.iea.org/reports/world-energy-investment-2019>.
- International Finance Corporation (IFC). (2010). *Strategic Community Investment: A Good Practice Handbook for Companies Doing Business in Emerging Markets*. World Bank.

- International Labor Organization (ILO). (1991). *Seguridad y salud en minas a cielo abierto*. Geneva: International Labor Office.
- International Labor Organization (ILO). (2002). Línea de Base Trabajo infantil en la minería artesanal del oro en Ecuador. Retrieved from http://white.lim.ilo.org/ipe/ntos/lb_mineria_ecuador.pdf.
- International Labor Organization (ILO). (2019). Aprovechamiento del potencial de las industrias extractivas: Trabajo decente en la economía rural. *Notas de orientación de políticas*. Organización Internacional de Trabajo. Retrieved from https://www.ilo.org/groups/public/—ed_dialogue/—sector/0documents/publication/wcms_.pdf.
- International Monetary Fund (IMF). (January 2019). Fiscal Transparency Initiative. *Policy Papers*, 19. doi:10.5089/9781513510224.007.
- International Monetary Fund (IMF). (2012). *Regímenes fiscales de las industrias extractivas: Diseño y aplicación*. Tech. rep., Departamento de Finanzas Públicas. Retrieved from <https://www.imf.org/media/Websites/IMF/imported-publications-loe-pdfs/external/spanish/np/pp/2012/081512s.ashx>.
- International Monetary Fund (IMF). (2017). Update on the Standard Template to Collect Data on Government Revenues from Natural Resources. *Washington, D.C.: IMF*. Retrieved from <https://www.imf.org/en/Publications/Policy-Papers/Issues/2017/04/27/update-on-the-standard-template-to-collect-data-on-government-revenues-from-natural-resources>.
- International Monetary Fund (IMF). (2018). *Regional Economic Outlook, April 2018, Western Hemisphere Department*. Washington, D.C: International Monetary Fund.
- International Monetary Fund (IMF). (2019). Fiscal Transparency Initiative: Integration of Natural Resource Management Issues. *Washington, D.C.: IMF*. Retrieved from <https://www.imf.org/en/Publications/Policy-Papers/Issues/2019/01/29/pp122818fiscal-transparency-initiative-integration-of-natural-resource-management-issues>.
- Isham, J., Woolcock, M., Pritchett, L., & Busby, G. (August 2005). The Varieties of Resource Experience: Natural Resource Export Structures and the Political Economy of Economic Growth. *The World Bank Economic Review*, 19, 141–174. doi:10.1093/wber/lhi010.
- Izquierdo, A., Pessino, C., & Vuletin, G. (2018). *Mejor gasto para mejores vidas: cómo América Latina y el Caribe puede hacer más con menos* (Vol. 10). Inter-American Development Bank.
- Izquierdo, A., Riera-Crichton, D., Végh, C., & Vuletin, G. (2018). How Big Are Public Consumption Multipliers? *Inter-American Development Bank, Washington, D.C. Unpublished*.
- Jara, J. J. (June 2017). Determinants of country competitiveness in attracting mining investments: An empirical analysis. *Resources Policy*, 52, 65–71. doi:10.1016/j.resourpol.2017.01.016.
- Jarquín, M. J., & Brathwaite, R. (2014). Rol de la información en la adjudicación de derechos de prospección y producción de petróleo. *Gobernanza con transparencia en tiempos de abundancia. Experiencias de las industrias extractivas en América Latina y el Caribe.*, 201.

- Jarvis, M. (May 2019). Transparency in the Petroleum Sector: The Importance of Information and Clear Processes for Effective Development in Fragile Contexts. In *Balancing Petroleum Policy: Toward Value, Sustainability, and Security* (págs. 151-168). The World Bank. doi:10.1596/978-1-4648-1384-9_ch7.
- Jefferson, M. (October 2020). A crude future? COVID-19s challenges for oil demand, supply and prices. *Energy Research & Social Science*, 68, 101669. doi:10.1016/j.erss.2020.101669.
- Jenkins, K. (November 2014). Women, mining and development: An emerging research agenda. *The Extractive Industries and Society*, 1, 329–339. doi:10.1016/j.exis.2014.08.004.
- Johnston, D. (December 2018). Government Take. *The Journal of World Energy Law & Business*, 11, 506–540. doi:10.1093/jwelb/jwy028.
- Johnston, D. (1994). *International petroleum fiscal systems and production sharing contracts*. Tulsa, Okla: PennWell Books.
- Kahatt, F. (2013). Las industrias extractivas y sus implicaciones políticas y económicas. *Estudios internacionales (Santiago)*, 45, 59–77.
- Kahn, T., Baron, A., & Vieyra, J. C. (November 2018). Tecnologías digitales para la transparencia en la inversión pública Nuevos instrumentos para empoderar a ciudadanos y gobiernos. *DOCUMENTO PARA DISCUSIÓN NºIDB-DP-634*. Retrieved from https://www.researchgate.net/profile/Juan_Vieyra/publication/332494855_Digital_Technologies_for_Transparency_in_Public_Investment_New_Tools_to_Empower_Citizens_and_Governments/links/5cb80cd492851c8d22f2effa/Digital-Technologies-for-Transparency-in-Public-Investment-New-Tools-to-Empower-Citizens-and-Governments.pdf.
- Kanda, W., & Kivimaa, P. (October 2020). What opportunities could the COVID-19 outbreak offer for sustainability transitions research on electricity and mobility? *Energy Research & Social Science*, 68, 101666. doi:10.1016/j.erss.2020.101666.
- Kaufmann, D., & Bellver, A. (2005). Ana, Transparenting Transparency: Initial Empirics and Policy Applications. Retrieved from <https://ssrn.com/abstract=808664>.
- Kaufmann, D., Kraay, A., & Mastruzzi, M. (2009). *Governance matters VIII: Aggregate and individual governance indicators 1996-2008*. The World Bank.
- Kaufmann, D., Robinson, M., & Vieyra, J. C. (2019). How Latin America Can Use its Natural Resource Wealth Responsibly. *Americas quarterly*. Retrieved from <https://www.americasquarterly.org/content/how-latin-america-can-use-its-natural-resource-wealth-responsibly>.
- Kesler, S. E., Simon, A. C., & Simon, A. F. (October 2015). *Mineral resources, economics and the environment*. Cambridge University Press. doi:https://doi.org/10.1017/CBO9781139871426.
- Knobel, A. (2017). Regulación sobre beneficiarios finales en América Latina y el Caribe. *Nota técnica Nro. 1341 (DB-TN-1341)*. Washington, D. C.: Inter-American Development Bank. Retrieved from <https://publications.iadb.org/es/publicacion//regulacion-sobre-beneficiarios-finales-en-america-latina-y-el-caribe>.

- Kolstad, I., & Wiig, A. (March 2009). Is Transparency the Key to Reducing Corruption in Resource-Rich Countries? *World Development*, 37, 521–532. doi:10.1016/j.worlddev.2008.07.002.
- Korinek, J. (January 2020). The mining global value chain. *The mining global value chain*. Organisation for Economic Co-Operation and Development (OECD). doi:10.1787/2827283e-en.
- Korinek, J., & Ramdoo, I. (December 2017). Local content policies in mineral-exporting countries. doi:https://doi.org/https://doi.org/10.1787/4b9b2617-en.
- Kowalczyk-Hoyer, B. (2011). Promoting Revenue Transparency: 2011 report on oil & gas companies. *Revenue Watch Institute & Transparency International: New York/Berlin*.
- Lares, M. E., Pacheco, L. A., & Sucre, C. G. (September 2019). *Un modelo de agencia reguladora independiente de hidrocarburos*. Inter-American Development Bank. doi:10.18235/0001916.
- Lashitew, A. A., Ross, M. L., & Werker, E. (March 2020). What Drives Successful Economic Diversification in Resource-Rich Countries? *The World Bank Research Observer*. doi:10.1093/wbro/lkaa001.
- Lauletta, M., Rossi, M. A., Vieyra, J. C., & Arisi, D. (November 2019). *Monitoring Public Investment: The Impact of MapaRegalías in Colombia*. Inter-American Development Bank. doi:10.18235/0002014.
- Leamer, E. E., Maul, H., Rodriguez, S., & Schott, P. K. (June 1999). Does natural resource abundance increase Latin American income inequality? *Journal of Development Economics*, 59, 3–42. doi:10.1016/s0304-3878(99)00004-8.
- Lederman, D., & Maloney, W. F. (2007). *Natural resources, neither curse nor destiny*. Palo Alto, CA Washington, D.C.: Stanford Economics and Finance, an imprint of Stanford University Press World Bank.
- Leith, J. C. (31 March 2005). *Why Botswana Prospered*. McGill-Queen's University Press. Retrieved from <http://www.jstor.org/stable/j.ctt80xfp>.
- Lemgruber, A., & Shelton, S. (2014). *Revenue administration : administering revenues from natural resources : a short primer*. Washington, D.C: International Monetary Fund, Fiscal Affairs Dept. Retrieved from <https://www.imf.org/external/pubs/ft/tnm/2014/nm1402.pdf>.
- Levin, K., Fransen, T., Ross, K., Elliott, C., Manion, M., Waite, R., . . . Worker, J. (2018). Long-Term Low Greenhouse Gas Emission Development Strategies: Approaches and Methodologies for Their Design. *WRI/UNDP*.
- Lopez-Murphy, P., & Villafuerte, M. (2010). Fiscal policy in oil producing countries during the recent oil price cycle. *IMF Working Papers*, 1–23.
- Lu De Lama, M. (2015). Analisis político normativo y tecnico de la situacion del subsector hidrocarburos en Perú. *Derecho, Ambiente y Recursos Naturales (DAR)*. Retrieved from http://dar.org.pe/archivos/publicacion/pu_161_estudio_hibrocarburos.pdf.
- Lutz, B. F., & Follette, G. R. (2012). Fiscal Rules, What Does the American Experience Tell Us? *SSRN Electronic Journal*. doi:10.2139/ssrn.2191191.
- Ma, C., & Valencia, F. (2018). Welfare Gains from Market Insurance: The Case of Mexican Oil Price Risk. *IMF Working Paper No. 18/35*.

- Macdonald, C. (2017). *The role of gender in the extractives industries*. UNU-WIDER. doi:10.35188/unu-wider/2017/276-2
- Machmud, T. N. (1993). Production Sharing Contracts in Indonesia: 25 Years' History. *J. Energy & Nat. Resources L.*, 11, 179.
- Maloney, W. F. (February 2002). *Innovation and Growth in Resource Rich Countries*. Working Papers Central Bank of Chile, Central Bank of Chile. Retrieved from <https://ideas.repec.org/p/chb/bcchwp/148.html>.
- Månberger, A., & Stenqvist, B. (August 2018). Global metal flows in the renewable energy transition: Exploring the effects of substitutes, technological mix and development. *Energy Policy*, 119, 226–241. doi:10.1016/j.enpol.2018.04.056.
- Manzano, O. (2014). Transparent Governance in an Age of Abundance. In Vieyra, & Masson (Edits.). Washington, D.C.: Inter-American Development Bank.
- Manzano, O., Powell, A., & Navajas, F. (20 December 2017). *The Economics of Natural Resources in Latin America: Taxation and Regulation of the Extractive Industries*. Taylor & Francis Ltd. Retrieved from https://www.ebook.de/de/product/30921424/the_of_natural_resources_in_latin_america.html.
- Marin, A., Stubrin, L., Murguía, D., Carreras, E., & Rocío, P. (2020). Innovación y Competitividad en Cadenas de Valor Mineras: el caso de Argentina. *Internal document. Inter-American Development Bank*.
- Masson, M., & Vieyra, J. (November 2014). *Gobernanza con transparencia en tiempos de abundancia. Experiencias de las industrias extractivas en América Latina y el Caribe*. Inter-American Development Bank.
- Masson, M., Walter, M., & Priester, M. (2013). *Incentivizing Clean Technology in the Mining Sector in Latin America and the Caribbean: The Role of Public Mining Institutions*, Inter-American Development Bank Energy Division (ENE) Technical Note No. Tech. rep., IDB-TN-612. 2013. Available online: <https://publications.iadb.org>
- McGlade, C., & Ekins, P. (2015). The geographical distribution of fossil fuels unused when limiting global warming to 2 C. *Nature*, 517, 187–190.
- McKenzie, B. &. (2017). *Guide to investing in the oil & gas industry in Australia*. Tech. rep., Baker & McKenzie International.
- McKinsey. (2020). The mine-to-market value chain: A hidden gem. *McKinsey*. Retrieved from <https://www.mckinsey.com/industries/metals-and-mining/our-insights/the-mine-to-market-value-chain-a-hidden-gem>.
- McPherson, C. (2008). State Participation in the Natural Resource Sectors: Evolution. *Issues And Outlook, IMF*, 11–13.
- McPherson, C. (2010). 9 State participation in the natural resource sectors. *The taxation of petroleum and minerals: Principles, problems and practice*, 263–288.
- McPherson, C. (2010). The Taxation of Petroleum and Minerals: Principles, Problems, and Practice. In M. K. P. Daniel (Ed.). London and New York: Routledge, and Washington, D.C.: IMF.

- Medinaceli, S. (June 2010). *Contratos de Exploración y Explotación de Hidrocarburos: América Latina 2010*. Organización Latinoamericana de Energía (OLADE). Retrieved from https://www.researchgate.net/profile/Sergio_Medinaceli/publication/259183990_Contratos_de_Exploracion_y_Explotacion_de_Hidrocarburos_America_Latina_2010/links/0deec52a3814cedc53000000/Contratos-de-Exploracion-y-Explotacion-de-Hidrocarburos-America-Latina-2010.pdf.
- Mehlum, H., Moene, K., & Torvik, R. (2006). Institutions and the resource curse. *The economic journal*, 116, 1–20.
- Mewes, L., & Broekel, T. (March 2020). Subsidized to change? The impact of R&D policy on regional technological diversification. *The Annals of Regional Science*. doi:10.1007/s00168-020-00981-9.
- Mikesell, R. F. (16 March 2017). *Petroleum Company Operations and Agreements in the Developing Countries*. Taylor & Francis Ltd. Retrieved from https://www.ebook.de/de/product/28981252/raymond_f_mikesell_petroleum_company_operations_and_agreements_in_the_developing_countries.html.
- Milano, F. (2018). *Extractive Sector and Civil Society: When the Work of Communities, Governments and Industries Leads to Development*. Inter-American Development Bank.
- Mintz, J., & Chen, D. (2012). Capturing economic rents from resources through royalties and taxes. *SPP Research Paper*.
- Mitchell, J., Mitchell, B., & Marcel, V. (July 2015). Oil and Gas Mismatches: Finance, Investment and Climate Policy.
- Molano, J., Ramírez, I., & Duque, M. V. (2012). Minería: conflictos socioambientales, despojo y territorialidad. *Minería, territorio y conflicto en Colombia*. Bogotá: Universidad Nacional de Colombia.
- Monaldi, F. (2010). La economía política del petróleo y el gas en América Latina. *Plataforma Democrática*, 9.
- Monaldi, F. J. (2017). The Rule of Law and Foreign Investment in Oil: Petroleum Nationalism in Latin America and Its Implications for Mexico.
- Monday, J. U. (2015). Local content policy, human capital development and sustainable business performance in the Nigerian oil and gas industry. *Journal of Management and Sustainability*, 5, 75. Retrieved from https://www.researchgate.net/profile/Monday_/publication/276349008_Local_Content_Policy_Human_Capital_Development_and_Sustainable_Business_Performance_in_the_Nigerian_Oil_and_Gas_Industry/links/567591cd08ae125516e72494/Local-Content-Policy-Human-Capital-Development-and-Sustainable-Business-Performance-in-the-Nigerian-Oil-and-Gas-Industry.pdf.
- Moran, T. H. (1972). Politics of Economic Nationalism and the Evolution of Concession Agreements. *The American Journal of International Law*, 66, 216–219.
- Muñoz, A., Pineda, E., & Radics, A. (2017). Descentralización fiscal y disparidades regionales en América Latina: el potencial de las transferencias de igualación. *Inter-American Development Bank*.
- Muramalla, V. S., & Abdel Gawad, G. M. (2013). Foreign Direct Investment (FDI) and its effects on oil, gas and refinery production and their exports: An applied study. *Journal of Economics and Sustainable Development*.

- Murphy, P. L., Villafuerte, M. M., & Ossowski, M. R. (2010). *Riding the roller coaster: Fiscal policies of nonrenewable resource exporters in Latin America and the Caribbean*. International Monetary Fund.
- Musacchio, A., & Lazzarini, S. G. (2014). *Reinventing State Capitalism: Leviathan in Business, Brazil and Beyond*. Harvard University Press.
- Musacchio, A., & Pineda, E. I. (Edits.). (November 2019). *Fixing State-Owned Enterprises: New Policy Solutions to Old Problems*. Inter-American Development Bank. doi:10.18235/0002012.
- Myers, K., & House, C. (2005). *Petroleum, poverty and security*. Royal Institute of International Affairs.
- Nakhle, C. (January 2010). Petroleum fiscal regimes: evolution and challenges. *The Taxation of Petroleum and Minerals Principles, Problems and Practice*, 75-86.
- Natural Resource Governance Institute (NRGI). (2015). Extractives-Linked Infrastructure Exploring Options for Shared Use of Infrastructure Projects. Retrieved from https://resourcegovernance.org/sites/default/files/nrgi_Extractives-Linked-Infrastructure.pdf.
- Natural Resource Governance Institute (NRGI). (2015). State Participation in Oil, Gas and Mining. Retrieved from https://resourcegovernance.org/sites/default/files/documents/state-owned_briefing_eng_20150310.pdf.
- Natural Resource Governance Institute (NRGI). (2017). *Índice de Gobernanza de los Recursos Naturales 2017*. Tech. rep., Instituto de la Gobernanza de los Recursos Naturales (NRGI). Retrieved from <https://resourcegovernance.org/sites/default/files/2017-resource-governance-index-spanish.pdf>.
- Natural Resource Governance Institute (NRGI). (2017). *Resource Governance Index 2017*. Tech. rep. Retrieved from <https://resourcegovernance.org/sites/default/files/2017-resource-governance-index.pdf>.
- Navajas, F., Powell, A., & others. (20 November 2017). *The Economics of Natural Resources in Latin America: Taxation and Regulation of the Extractive Industries*. Taylor & Francis Ltd. Retrieved from https://www.ebook.de/de/product/30921424/the_economics_of_natural_resources_in_latam.html.
- Navas-Aleman, L., & Bazan, L. (2020). Innovation and Competitiveness in Mining Value Chains: The case of Brazilian suppliers to the copper industry. *Internal document*. Inter-American Development Bank.
- New Energy Nexus. (2020). Building Lithium Valley. Opportunities and Challenges Ahead for Developing California's Battery Manufacturing Ecosystem. Retrieved from https://www.newenergynexus.com/wp-content/uploads/2020/10/New-Energy-Nexus_Building-Lithium-Valley.pdf.
- Nigeria. (2014). 2014–16 Medium-Term Expenditure Framework and Fiscal Strategy Paper. *Abuja: Budget Office of the Federation*.
- Noruega. (2013). Long-Term Perspectives for the Norwegian Economy 2013—A Summary. *Meld. St. 12 (2012–13) Report to the Storting (White Paper) Summary*. Oslo: Ministry of Finance.
- Oblasser, A., & Chaparro Avila, E. (2008). *Estudio comparativo de la gestión de los pasivos ambientales mineros en Bolivia, Chile, Perú y Estados Unidos*. ECLAC.

- OECD. (2019). *Aligning Development Co-operation and Climate Action*. doi:<https://doi.org/https://doi.org/10.1787/5099ad91-en>.
- OECD. (August 2016). *Collaborative Strategies for In-Country Shared Value Creation*. OECD. doi:<https://doi.org/https://doi.org/10.1787/9789264257702-en>.
- OECD/IEA. (2019). Update on recent progress in reform of inefficient fossil-fuel subsidies that encourage wasteful consumption. Retrieved from <https://www.oecd.org/fossil-fuels/publication/OECD-IEA-G20-Fossil-Fuel-Subsidies-Reform-Update-2019.pdf>.
- O'Higgins, E. R. (April 2006). Corruption, Underdevelopment, and Extractive Resource Industries: Addressing the Vicious Cycle. *Business Ethics Quarterly*, 16, 235–254. doi:<https://doi.org/10.1017/S1052150X00012823>.
- Onorato, W. T., & Park, J. J. (2001). World Petroleum Legislation: Frameworks That Foster Oil and Gas Development. *Alta. L. Rev.*, 39, 70.
- Organization for Economic Cooperation and Development (OECD) et al. (September 2019). *Perspectivas económicas de América Latina 2019*. OECD. doi:10.1787/g2g9ff1a-es.
- Organization for Economic Cooperation and Development (OECD). (August 2015). *Informe de la OCDE sobre el Soborno Internacional*. OECD Publishing. doi:10.1787/-es.
- Organization of American States (OAS). (2012). Institucionalización de género en los ministerios de trabajo de Las Américas. *Comisión Interamericana de Mujeres (CIM)*. Retrieved from <https://www.oas.org/es/CIM/docs/SeguimientoTalleres-GéneroES.pdf>.
- Ortega, E. G., Pugachevsky, A., & Walser, G. (2009). *Catastro minero: promoviendo la transparencia en el acceso a los recursos minerales*. Tech. rep., The World Bank.
- Ossowski, R. J., & Halland, H. (September 2016). *Fiscal management in resource-rich countries : essentials for economists, public finance professionals, and policy makers (English)*. World Bank Studies. Washington, D.C. : World Bank Group. doi:10.1596/978-1-4648-0492-2.
- Oxfam. (2002). Tunnel Vision: Women, Mining and Communities. Retrieved from <https://www.oxfam.org.au/wp-content/uploads/2011/11/OAus-TunnelVisionWomen.pdf>.
- Pantoja, F. H., & Pantoja, S. D. (September 2016). Problemas y desafíos de la minería de oro artesanal y en pequeña escala en Colombia. *Revista Facultad de Ciencias Económicas*, 24. doi:10.18359/rfce.2217.
- Pargendler, M., Musacchio, A., & Lazzarini, S. G. (2013). In Strange Company: The Puzzle of Private Investment in State-Controlled Firms. *SSRN Electronic Journal*. doi:10.2139/ssrn.2217627.
- Parmenter, J. (2011). Experiences of Indigenous Women in the Australian Mining Industry. In *Gendering the Field: Towards Sustainable Livelihoods for Mining Communities* (Vol. 6, págs. 67–86). ANU Press. Retrieved from <http://www.jstor.org/stable/j.ctt24h9g4.11>.
- Partridge, W. L., & Mejía, M. C. (2013). Socio-Cultural Analysis in IDB Projects: A Discussion Paper. *Washington, D.C.: Inter-American Development Bank*.
- Perafan, C., & Moyer, D. (2006). The indigenous challenge. *Inter-American Development Bank*. Retrieved from https://digitalrepository.unm.edu/la_energy_dialog/92.
- Perrotti, D. E., & Sánchez, R. (2011). La brecha de infraestructura en América Latina y el Caribe.

- Petrobras. (2015). Financial Report. Retrieved from <https://www.investidorpetrobras.com/enu/2990/ComunicadoArquivamentoForm20F2015Ingles.pdf>.
- Petroleum, B. (2020). Statistical Review of World Energy 2020. 69th edition.
- Pimenta, C., & Pessoa, M. (2015). Public Financial Management in Latin America: The Key to Efficiency and Transparency. *Inter-American Development Bank*.
- Pimenta, C., & Seco, A. (January 2019). *Oportunidades tecnológicas y recomendaciones para la modernización de los sistemas integrados de administración financiera en América Latina y el Caribe*. Inter-American Development Bank. doi:10.18235/0001522.
- Pineda, E., Ter-Minassian, T., Ahmad, E., Letelier, L., Letelier, L., & Fernández, I. (July 2018). *Estrategia integral para una descentralización efectiva y fiscalmente responsable: evidencia de Chile*. Inter-American Development Bank. doi:10.18235/0001204.
- Pineda, E., Valencia, O., & Andrian, L. (2020). Possible macro-fiscal consequences of COVID-19 in Latin America. *Blog of the IDB's Fiscal management Division*. Retrieved from <https://blogs.iadb.org/gestion-fiscal/en/possible-macro-fiscal-consequences-covid-19-latin-america/>.
- Pointet, A. (2004). CLAN: Cultural Land Use Analysis Methodology. *Inter-American Development Bank – École polytechnique fédérale de Lausanne*.
- Pongsiri, N. (August 2004). Partnerships in oil and gas production-sharing contracts. *International Journal of Public Sector Management*, 17, 431–442. doi:10.1108/09513550410546606
- Poterba, J. M. (August 1994). State Responses to Fiscal Crises: The Effects of Budgetary Institutions and Politics. *Journal of Political Economy*, 102, 799–821. doi:10.1086/261955.
- Quijano Vallejos, P., Veit, P., Tipula, P., & Reytar, K. (2020). Undermining Rights: Indigenous Lands and Mining in the Amazon.
- Radon, J. (2005). The ABCs of petroleum contracts: license-concession agreements, joint ventures, and production-sharing agreements. *A Reporter's Guide to Energy and Development of Open Society Institute*.
- Ravilla, E. (2019). Reglas fiscales resilientes en América Latina. In A. Barreix, & L. F. Corrales (Edits.). Inter-American Development Bank.
- REN21. (2019). Renewables 2019: Global status report. *REN21 Secretariat*. Retrieved from https://www.ren21.net/wp-content/uploads/2019/05/gsr_2019_full_report_en.pdf.
- Rentschler, J. E. (September 2013). *Oil Price Volatility, Economic Growth and the Hedging Role of Renewable Energy*. The World Bank. doi:10.1596/1813-9450-6603.
- Reyes-Tagle, G. (Ed.). (August 2018). *Bringing PPPs into the Sunlight: Synergies Now and Pitfalls Later?* Inter-American Development Bank. doi:10.18235/0001240.
- Rivas, G. (2014). El fomento al emprendimiento dinámico en países del Cono Sur de América Latina: Análisis de experiencias y lecciones de política. *Inter-American Development Bank, IDB-DP-363*.
- Robinson, J. A., Torvik, R., & Verdier, T. (April 2006). Political foundations of the resource curse. *Journal of Development Economics*, 79, 447–468. doi:https://doi.org/10.1016/j.jdeveco.2006.01.008.

- Rodriguez, M. E. (2017). *A Agenda da Sociedade Civil contrasas Indústrias Extractivas na Brasil*. (IBASE, Ed.) Natural Resource Governance Institute. Retrieved from <http://redextractivas.org/wp-content/uploads/2017/08/Reporte-Brasil.pdf>.
- Rodríguez-Pose, A., & Palavicini-Corona, E. I. (January 2013). Does local economic development really work? Assessing LED across Mexican municipalities. *Geoforum*, 44, 303–315. doi:10.1016/j.geoforum.2012.07.010.
- Rojas, L., & Banerjee, O. (September 2019). *Capital natural en América Latina y el Caribe*. Inter-American Development Bank. doi:10.18235/0001872.
- Roopnarine, L. (2002). Wounding Guyana: Gold Mining and Environmental Degradation. *Revista Europea de Estudios Latinoamericanos y del Caribe / European Review of Latin American and Caribbean Studies*, 83–91. Retrieved from <http://www.jstor.org//25675989>.
- Ross, M. L. (April 2001). Does Oil Hinder Democracy? *World Politics*, 53, 325–361. doi:10.1353/wp.2001.0011.
- Saade Hazin, M. (2014). *Buenas prácticas que favorezcan una minería sustentable: la problemática en torno a los pasivos ambientales mineros en Australia, el Canadá, Chile, Colombia, los Estados Unidos, México y el Perú*. Macroeconomía del Desarrollo, United Nations Economic Commission for Latin America and the Caribbean (ECLAC). Retrieved from <https://EconPapers.repec.org/RePEc:ecr:col037:37106>.
- Sachs, J. D., & Warner, A. M. (May 2001). The curse of natural resources. *European Economic Review*, 45, 827–838. doi:10.1016/s0014-2921(01)00125-8.
- Sala-i-Martin, X., & Subramanian, A. (June 2003). *Addressing the Natural Resource Curse: An Illustration from Nigeria*. National Bureau of Economic Research. doi:10.3386/w9804.
- Saldaña, & Velásquez, C. A. (2009). Una aproximación al régimen de regalías e impuesto a la renta en los contratos de exploración y explotación de hidrocarburos. *Revista de Derecho Administrativo*, 243–252.
- Sánchez, M. (2012). Documento de Visión y Alcance. Fase Beta para el Sistema General de Regalías. *Proposal to Microsoft Services*.
- Sánchez, R. J., & others. (2019). *La bonanza de los recursos naturales para el desarrollo: dilemas de gobernanza*. Santiago, Chile: ECLAC.
- Sanchez, S., Martinez, R., Perez, J., Cordova, H., Irahola, H., & Velasquez, R. (2017). *La Agenda de la Sociedad Civil frente a las Industrias Extractivas en Bolivia*. (F. Jubileo, Ed.) Natural Resource Governance Institute. Retrieved from <http://redextractivas.org/wp-content/uploads/2017/08/Reporte-Bolivia.pdf>.
- Sandi, E., & Lafuente, D. (2020). Impacto del coronavirus (COVID-19) en la minería artesanal y de pequeña escala de Bolivia. *Solidaridad y Cumbre del Sajama S.A.*
- Schaeffer, M., Hutfilter, U. F., Brecha, R., Fyson, C., & Hare, B. (2019). Insights from the IPCC Special Report on 1.5°C for preparation of long-term strategies. *Climate Analytics*.
- Schaffitzel, F., Jakob, M., Soria, R., Vogt-Schilb, A., & Ward, H. (June 2019). *Can Government Transfers Make Energy Subsidy Reform Socially Acceptable?: A Case Study on Ecuador*. Inter-American Development Bank. doi:10.18235/0001740.
- Schiavo-Campo, S., & Sundaram, P. (2000). *To serve and to preserve : improving public administration in a competitive world*. Manila, Philippines: Asian Development Bank.

- Schrecker, T., Birn, A.-E., & Aguilera, M. (July 2018). How extractive industries affect health: Political economy underpinnings and pathways. *Health & Place*, 52, 135–147. doi:10.1016/j.healthplace.2018.05.005.
- Schrijver, N. (1997). *Sovereignty over natural resources: balancing rights and duties* (Vol. 4). Cambridge University Press.
- Serebrisky, T., Suárez-Alemán, A., Margot, D., & Ramirez, M. C. (2015). *Financing Infrastructure in Latin America and the Caribbean: How, how much and by whom*. Inter-American Development Bank Washington, D.C.
- Serebrisky, T., Suárez-Alemán, A., Pastor, C., & Wohlueter, A. (October 2017). *Increasing the Efficiency of Public Infrastructure Delivery: Evidence-based Potential Efficiency Gains in Public Infrastructure Spending in Latin America and the Caribbean*. Inter-American Development Bank. doi:10.18235/0000846.
- Sheldon, C. G., Casis, A. Z., Caspary, G., Seiler, V., & Fernando Mier, R. (2013). Innovative approaches for multi-stakeholder engagement in the extractive industries (English). *Extractive industries for development series*. Washington, D.C. : World Bank. Retrieved from <http://documents.worldbank.org/curated/en/505541468340258421/approaches-for-multi-stakeholder-engagement-in-the-extractive-industries>.
- Sociedad Peruana de Derecho Ambiental (SPDA). (2014). *La realidad de la minería ilegal en países amazónicos : Bolivia, Brasil, Colombia, Ecuador, Perú, Venezuela*. San Isidro, Lima, Peru.
- Solano-Rodriguez, B., Pye, S., Li, P.-H., Ekins, P., Manzano, O., & Vogt-Schilb, A. (August 2019). *Implications of Climate Targets on Oil Production and Fiscal Revenues in Latin America and the Caribbean*. Inter-American Development Bank. doi:10.18235/0001802.
- Søreide, T. (January 2011). *International Handbook on the Economics of Corruption*.
- Stanley, M., & Mikhaylova, E. (2011). Mineral resource tenders and mining infrastructure projects guiding principles.
- Stefanović, A., & Saavedra Alvaray, M. (2016). Las mujeres en el sector minero de Chile: propuestas para políticas públicas de igualdad.
- Task Force on Climate-related Financial Disclosures (TCFD). (2017). Final Report: Recommendations of the TCFD. Retrieved from <https://www.fsb-tcfd.org/publications/recommendations-report/>.
- Task Force on Climate-related Financial Disclosures (TCFD). (2019). TCFD: 2019 Status Report. Retrieved from <https://www.fsb-tcfd.org/publications/tcfd-2019-status-report/>.
- Ter-Minassian, T. (October 2017). *Identifying and Mitigating Fiscal Risks from State-Owned Enterprises (SOEs)* . Inter-American Development Bank. doi:10.18235/0000872.
- The Intergovernmental Panel on Climate Change (IPCC). (2018). Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. Retrieved from <https://www.ipcc.ch/sr15/>.
- The International Institute for Sustainable Development (IISD). (2017). Global Trends in Artisanal and Small-Scale Mining (ASM): A review of key numbers and issues. *Winnipeg: IISD*.

- The International Institute for Sustainable Development (IISD). (2018). Designing Local Content Policies in Mineral-Rich Countries. Retrieved from <https://www.iisd.org/sites/files/publications/local-content-policies-mineral-rich-countries.pdf>.
- The International Institute for Sustainable Development (IISD). (2019). 15th AGM of the Intergovernmental Forum on Mining, Metals, Minerals and Sustainable Development. *IGF Bulletin Vol. 2010 No. 20*.
- Thurber, M. C., Hults, D. R., & Heller, P. R. (September 2011). Exporting the \textquotedblleftNorwegian Model\textquotedblright: The effect of administrative design on oil sector performance. *Energy Policy*, 39, 5366–5378. doi:10.1016/j.enpol.2011.05.027.
- Timor-Leste. (2014). República Democrática de Timor Leste: State Budget 2014-Budget Overview, Book 1. *Dili: Ministry of Finance*.
- Toledo, C., & Liberona, F. (2017). *La Agenda de la Sociedad Civil frente a las Industrias Extractivas en Chile*. (F. Terram, Ed.) Natural Resource Governance Institute. Retrieved from <http://redextractivas.org/wp-content/uploads/2017/08/Reporte-Chile.pdf>.
- Tordo, S., Johnston, D., & Johnston, D. (2010). Petroleum exploration and production rights : allocation strategies and design issues (English). *World Bank working paper*. Retrieved from <http://documents.worldbank.org/curated/en/785881468336848695/exploration-and-production-rights-allocation-strategies-and-design-issues>.
- Tornell, A., & Lane, P. R. (March 1999). The Voracity Effect. *American Economic Review*, 89, 22-46. doi:10.1257/aer.89.1.22.
- United Nations Environment Programme (UNEP). (2012). Analysis of formalization approaches in the artisanal and small-scale gold mining sector based on experiences in Ecuador, Mongolia, Peru, Tanzania and Uganda Peru Case Study. Retrieved from <https://wedocs.unep.org/handle/20.500.11822/31224>.
- United Nations Environment Programme (UNEP). (2018). *The emissions gap report 2018*. Nairobi, Kenya: United Nations Environment Programme.
- United Nations Environment Programme (UNEP). (2019). The Production Gap. *United Nations*. Retrieved from <https://www.unenvironment.org/resources/report/production-gap-report-2019>.
- United Nations. Economic Commission for Africa (UN ECA). (2018). Artisanal and small-scale mining policy guidance for the country mining vision. *Special Initiatives Division. African Minerals Development Center, Addis Ababa*.
- Valdez Muñoz, W. (2013). Marco institucional para la gestión ambiental en el Perú. *Derecho PUCP*, 45–62.
- Vale Columbia Center on Sustainable International Investment (VCC). (2011). Resource-Based Sustainable Development in the Lower Zambezi Basin. *Columbia University*.
- van de Ven, D. J., & Fouquet, R. (February 2017). Historical energy price shocks and their changing effects on the economy. *Energy Economics*, 62, 204–216. doi:https://doi.org/10.1016/j.eneco.2016.12.009.
- van der Ploeg, F., & Venables, A. J. (September 2012). Natural Resource Wealth: The Challenge of Managing a Windfall. *Annual Review of Economics*, 4, 315–337. doi:10.1146/annurev-economics-080511-111003.

- Velásquez, F. E., Martínez, M. F., & Peña, J. (2017). *La Agenda de la Sociedad Civil frente a las Industrias Extractivas en Colombia*. (F. F. por Colombia, Ed.) Natural Resource Governance Institute. Retrieved from <http://redextractivas.org/wp-content/uploads/2017/08/Reporte-Colombia.pdf>.
- Velásquez, H., Celada, M., Mejía, J., & Aguirre, A. (2017). *La Agenda de la Sociedad Civil frente a las Industrias Extractivas en Guatemala*. (CONGCOOP, Ed.) Natural Resource Governance Institute. Retrieved from <http://redextractivas.org/wp-content/uploads/08/Reporte-Guatemala.pdf>.
- Venables, A. J. (February 2016). Using Natural Resources for Development: Why Has It Proven So Difficult? *Journal of Economic Perspectives*, 30, 161–184. doi:10.1257/jep.30.1.161.
- Viale, C., & Cruzado, E. (2012). La distribución de la renta de las industrias extractivas a los gobiernos subnacionales en América Latina. *Lima: Revenue Watch Institute*.
- Vieyra, J. C., Aamot, A., Barón, A., Nava, M. H., & Quiróz, J. C. (June 2019). *Gobernanza con transparencia en tiempos de incertidumbre: Mejores prácticas y apuestas estratégicas para el sector extractivo en America Latina y el Caribe*. Inter-American Development Bank. doi:10.18235/0001741.
- Vieyra, J. C., Masson, M., & Walter, M. (2014). Gobernanza con transparencia en tiempos de abundancia. Experiencias de las industrias extractivas en América Latina y el Caribe. In J. Masson (Ed.). Inter-American Development Bank (IDB).
- Vio Gorget, D., & Walter, M. (January 2017). *Marcos normativos e institucionales de la minería en América Latina*. Inter-American Development Bank. doi:10.18235/0000606.
- Vlaicu, R., Verhoeven, M., Grigoli, F., & Mills, Z. (2014). Multiyear budgets and fiscal performance: Panel data evidence. *Journal of Public Economics*, 111, 79-95. Retrieved from <https://EconPapers.repec.org/RePEc:eee:pubeco:v:111:y:2014:i:c:p:79-95>
- von Hagen, J. (March 1991). A note on the empirical effectiveness of formal fiscal restraints. *Journal of Public Economics*, 44, 199–210. doi:10.1016/0047-2727(91)90025-w.
- Wen, J.-F. (2018). *Progressive Taxation of Extractive Resources as Second-Best Optimal Policy*. International Monetary Fund.
- Wise, H., & Shtylla, S. (2007). The role of the extractive sector in expanding economic opportunity. *New York: Harvard University and John F. Kennedy School of Government*.
- Woods, C., Valencia, K., & Cerqueira, D. (2017). Industrias extractivas y planes nacionales de acción sobre empresas y derechos humanos. *Fundación para el Debido Proceso (DPLF) y La Mesa Redonda Internacional para la Rendición de Cuentas Empresarial (ICAR)*. Retrieved from http://www.dplf.org/sites/default/files/icar_dplf_extractive_naps_guidance.pdf.
- Workman, D. (2020). Petroleum Gas Exports by Country. *World's Top Exports*. Retrieved from <http://www.worldstopexports.com/petroleum-gas-exports-country/>.
- World Bank. (2012). Mining Community Development Agreements Source Book. *Mining Community Development Agreements Source Book*. World Bank, Washington, D.C.
- World Bank. (2013). Timor-Leste - Country partnership strategy for the period FY2013-2017 (English). *Washington, D.C.: World Bank*. Retrieved from <http://documents.worldbank.org/curated/en/927031468131984331/Timor-Leste-Country-partnership-strategy-for-the-period-FY2013-2017>.

- World Bank. (2013). Use of Local Content in the Extractive Industries Enables Inclusive Growth. Retrieved from <https://www.worldbank.org/en/news/feature/2013/11/20/local-content-in-extractive-industries-enables-inclusive-growth>.
- World Bank. (2015). World Bank Group Engagement in Resource-Rich Developing Countries : The Cases of the Plurinational State of Bolivia, Kazakhstan, Mongolia, and Zambia. *Independent Evaluation Group, World Bank, Washington, D.C.*
- World Bank. (2019). State of the Artisanal and Small-Scale Mining Sector. *Washington, D.C.: World Bank.*
- Wright, G., & Czelusta, J. (August 2002). Exorcizing the Resource Curse: Minerals as a Knowledge Industry, Past and Present.
- Zakharova, D., & Gust, M. C. (2012). *Strengthening Russia's fiscal framework*. International Monetary Fund.