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Managing the Minerals Sector: Implications for Trade from Peru and Colombia

Jane Korinek

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Abstract

**MANAGING THE MINERALS SECTOR:
IMPLICATIONS FOR TRADE FROM PERU AND COLOMBIA**

Jane Korinek, OECD

Managing and regulating the extractive industries can pose substantial challenges to minerals-rich countries. Aiming to overcome the "resource curse", some countries attempt to generate greater gains from their natural resources by using trade policy instruments such as export restrictions. Others look to create a balanced regulatory framework to maximise gains from sustainable extraction and minimise the negative spillover effects. Colombia and Peru have aimed to do the latter. This study examines their experiences as regards some aspects of the management of their extractive industries. In particular, it examines the design of the tax system as it applies to non-renewable resources, the reform of the distribution of revenues from the sector, and strategies for tackling illegal mining. These policy areas are important to ensure that the extraction of natural resources benefits the economies and societies of the two Andean nations.

Keywords: Trade policy, export restrictions, mining, extractive industries, extractives, mineral resources, minerals, natural resources, copper, gold, Peru, Colombia, sovereign wealth fund, SWF, regulation, resource curse, informal mining, illegal mining, criminal mining, formalisation, mercury, peace dividend, ASM, corruption, canon, fiscal rule, mining royalties, stability contracts, OCAD system.

JEL Classification: O13, O24, O54, Q32, Q34, Q37

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The author is grateful for having had the opportunity to consult with staff in the following Colombian organisations: President's office, Ministry of Mining, National Mining Agency, National Planning Department, Finance Ministry, Ministry of the Environment, DIAN – Tax Inspection, Ministry of Commerce and Industry, National Geological Service, UNIMIL – la Unidad Nacional de Intervención Contra la Minería Ilegal, SMGE – Association of Large scale Mining, ANDI – Association of Colombian Entrepreneurs ARM – Alliance for Responsible Mining, Fedesarollo consulting, Cerrito Capital and Cerrejón mining. Sincere thanks to Fernando Toledo for facilitating Peruvian contacts for this study. Peruvian organisations consulted for this paper include: the Vice Ministry of Foreign Trade, Ministry of Energy and Mines, Ministry of Economy and Finance, Ingemmet Geological Service, Colombian Embassy in Paris, SNMEP Mining, Energy, Oil and Gas Association, Solidaridad network, IPE Peruvian Institute of the Economy, World Bank Peru office, Ernst and Young Peru, Quijandria and Laub consulting, Rodrigo, Elias and Medrano law, Cerro Verde and Buenaventura Mining Group. Apoyo Consultoría is responsible for a large contribution to the Peru study. This draft benefited from comments from Delegates to the Working Party of the Trade Committee on two occasions, from representatives of the Colombian and Peruvian governments, and from Ismael Benavides (former Minister of Economy and Finance, Peru), Marcial Garcia (Ernst and Young, Peru), and Christian Daude, Dan Devlin, Tyler Gillard and Louis Maréchal (all OECD). Research assistance by Cristine Arriola and Jimena Romero is gratefully acknowledged as is interpretation of legal texts by Véronique Bastien. Frank van Tongeren provided oversight for the project.

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Executive Summary

Managing and regulating the extractive industries can pose substantial challenges to minerals-rich countries. Aiming to overcome the "resource curse", some countries attempt to generate greater gains from their natural resources by using trade policy instruments such as export restrictions. Others look to create a balanced regulatory framework to maximize gains from sustainable extraction and minimize the negative spillover effects. Colombia and Peru have aimed to do the latter and have met with both challenges and some successes.

This study examines the experiences in Colombia and Peru as regards some aspects of the management of their extractive industries noting that both governments have strived to regulate and manage their natural resources without resorting to distortive trade policies such as export restrictions. In particular, the study examines the design of the tax system as it applies to non-renewable resources, the reform of the distribution of revenues from the sector, and strategies for tackling illegal mining. These policy areas are important to ensure that the extraction of natural resources benefits the economies and societies of the two Andean nations.

One way in which the extractive industries contribute to the wider economy is through the collection of tax revenue and its distribution. Historically, the Colombian regions where oil and minerals are extracted received the highest share of transfers from royalty payments by the extractive industries. Despite this, these regions were also the most impoverished: spending of royalty revenues was inefficient and corruption was widely documented. In 2011, Colombia passed an ambitious reform of the system of distribution of royalties from its extractive industries with the aim of allocating revenues more widely and ensuring more careful oversight of their spending. Revenue from royalties is now distributed according to a clear set of criteria, to be expended on infrastructure projects, and represents a large step in the direction of accomplishing the objectives of the reform. Greater monitoring and oversight of spending is an integral part of the reform and is explicitly funded. Much remains to be done, however, to ensure project and budgetary monitoring, to guard against fractioned spending on small infrastructure projects, and to ensure access to project funds by the regions and municipalities that need it most.

Peru is in a similar situation as Colombia was before its 2011 reform: much of the revenue from extractive industries in Peru flows to the sub-national governments in the regions where extraction takes place. In addition, funds are allocated in piecemeal fashion thereby allowing smaller than optimal infrastructure projects and there is little oversight. Corruption is widespread: nine of Peru's 25 regional presidents were accused of mismanagement of funds in irregular concessions and public expenditure in 2014. These indictments represent a precious opportunity to reform the way in which royalties and corporate tax from extractives are distributed and dispersed in Peru.

A first step toward reducing corruption and ensuring public oversight is transparency. The Extractive Industries Transparency Initiative (EITI) brings to light any irregularities between the payment and reception of mining taxes and discloses the results publicly. Peru is the first country to disclose its earnings at the sub-national level within the context of the EITI. Increased transparency will not resolve existing corruption problems but it may lead to greater accountability in the process. Colombia was admitted as an EITI candidate in October 2014.

There is a trade-off in tax design between risk sharing among public and private sectors and ease of tax calculation and collection. In Peru, all taxes pertaining to the mining sector are calculated on the basis of operating margins. Thereby firms are taxed at a higher rate when they are more profitable, e.g. during times of high commodity prices, and at a lower rate when they are less profitable. These taxes are harder to calculate and collect, however, as there is an asymmetry of information between tax

collectors and firms. Issues such as transfer pricing, although outside the scope of this paper, are of relevance in both Peru and Colombia.

One of the challenges to the mining sector in both Colombia and Peru is the presence of informal and illegal mining, particularly of gold. Challenges linked to informality include environmental damage, worker safety, non-compliance with technical norms, non-payment of taxes and royalties, and job insecurity. The informal sector is highly correlated with smuggling across borders of both inputs to and output of the extractive industries.

Perhaps the most pressing problem as regards informal gold mining is the use of mercury. Mercury contamination has been described by some officials as a disaster waiting to happen. Signing the Minamata Convention to do away with mercury use in artisanal and small mining was of prime importance—ensuring its implementation will be crucial. In particular, ensuring that mercury use and smuggling of the substance stops in accordance with obligations taken under the Convention may prove challenging.

In response to these challenges, the governments of Peru and Colombia have taken steps to formalize artisanal and small mining (ASM) operations. Some of the complex requirements to enter the formal sector are difficult to comply with, however, given the limited resources and low levels of education of many miners operating outside the formal sector. Few miners have been formalized through these processes to date in either Peru or Colombia. In Colombia, the newly-implemented contract system by which miners are grouped around a mining title-holder may help toward formalization.

Alternative models of support to small producers could help them gain access to international markets and integrate into the formal economy. The Chilean national mining firm, for example, and the Colombian Federation of coffee growers buy the raw material from small and artisanal producers, further process and add value through global marketing, and facilitate access to international markets for the processed product.

Integrating small-scale suppliers of gold into the formal economy through better regulation is certainly important. At the same time, instruments on the demand side can be used, in particular leveraging consumers' preferences for sustainably produced gold. A number of initiatives exist in this area. Certification systems outline sustainable practices for artisanal and small-scale mining. They also respond to demand from some gold buyers, in particular luxury brands, for sustainable, secure, certified supply chains. Peru has been at the forefront of some of these initiatives. Although the quantities of gold that have been certified to have been mined sustainably are small, there is scope for expansion. Competing standards and initiatives frustrate efforts of retail firms to manage their reputational risk. The scale of the environmental and social damage caused by illegal gold mining in the Andean region, as well as elsewhere, coupled with the demand by the retail sector for sustainably mined gold, suggests the necessity for a plurilateral solution.

There is a long history of challenges in the management and regulation of the extractive industries in Colombia and Peru and many of these challenges remain. Some of the recent reforms and initiatives, not least the reform of the royalties distribution system in Colombia and recent initiatives in Peru to promote sustainable ASM gold mining by leveraging the supply chain, represent a positive evolution. These policies have been undertaken without recourse to distorting trade policies.

1. Introduction

Governments of countries that are rich in natural resources have experienced challenges in managing extractive industries since their economic activity started. The potentially high value of the underground resources may attract more risk-taking or unsustainable behaviour encompassed in the "gold rush mentality" or "cowboy behaviour" of some mining firms, in particular in situations of under-regulation. One particularity of the extractive industries is that they can attract more investment and economic activity than the business climate can fully accommodate; another fundamental difference is that in the extractive sectors, investment is undertaken not only for business reasons but importantly as a function of geological constraints.

In order to manage their natural resources, some countries have chosen to apply distortive trade policies. More countries use export restrictions—barriers to export of minerals and metals—now than in the last decade (OECD, 2014c). OECD studies show, however, that export taxes and quotas are not the best way to manage the extractive industries and, in addition to leading to lower global welfare, do not benefit the countries that apply them (OECD, 2014c).

Governments apply export restrictions for a variety of reasons ranging from promotion of the downstream processing industry to generating government revenue to protection of the environment and conservation of natural resources. There are many policy tools available to resource-rich governments to manage the minerals sector with a view to achieving these objectives. Some countries have been successful in managing their minerals sector for a wider set of policy objectives without resorting to distortive trade policies such as export restrictions. Two countries that have been particularly successful in managing their minerals sectors without resorting to export restrictions are Chile and Botswana; they have been examined in two separate studies in this series (Korinek, 2013 and Korinek, 2014).

This study examines experiences in some aspects of the regulation and management of extractive industries in Colombia and Peru. In particular, it outlines the main taxes that are levied on the minerals sector (section 3); the system of distribution of revenue from the sector (section 4); and strategies for tackling illegal mining (section 5). Lessons that can be learned from Colombia and Peru for other minerals-rich countries in the concluding section (section 6) and remaining challenges are outlined. Before examining the policies that regulate and manage the minerals sector, a brief examination of the economic situation in both countries follows.

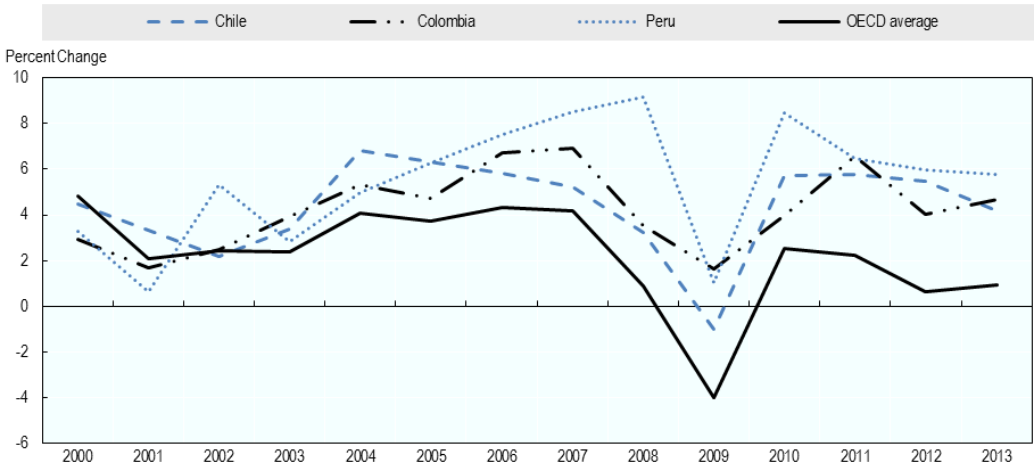
2. The economic context

Colombia

Colombia is Latin America's fourth largest economy behind Brazil, Mexico, and Argentina. The size of its economy in 2013 was estimated at USD 378 billion. Experiencing strong growth for the past decade, Colombia's economy has almost doubled in real terms since the early 2000s. During this period, the annual growth rate remained above the OECD average maintaining positive growth even during the global downturn in 2009 (Figure 1). However, despite the strength in the overall economy, GDP per capita remains 66% below the OECD average. A recent OECD Economic Survey on Colombia attributes the lower average income per capita to low labour productivity (OECD, 2013).

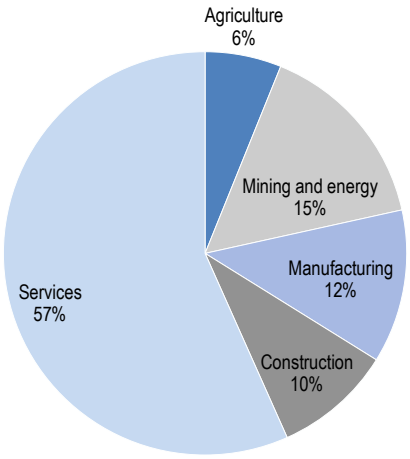
The structure of the economy has changed little since 2000. The services sector, comprised mainly of commercial and financial services, is the largest sector of activity and accounted for 57% of economic activity in Colombia in 2013. Mining and energy contributes 15% to the overall economy (Figure 2). However, it should be noted that this refers to the formal economy. The informal economy in Colombia is among the highest in Latin America; in 2009, over 60% of the Colombian workforce did not contribute to social security and were thus considered part of the informal sector according to the 2010-2014 National Development Plan**.**

Figure 1. Real GDP annual growth rate



Source: World Economic Outlook, IMF.

Figure 2. GDP* by sector of activity, 2013



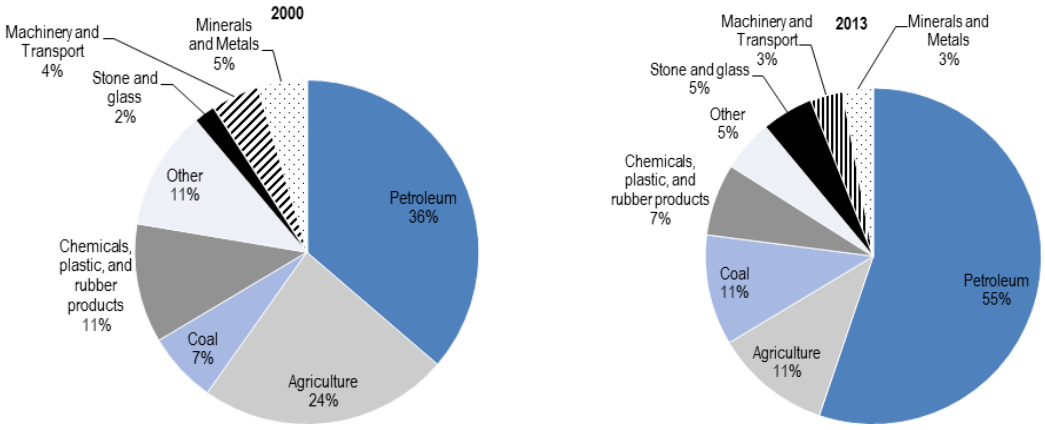
* Provisional 2013 estimate of added value in current prices.

Source: Banco de la República, Colombia, ISIC Rev. 3.

Colombian exports represented 16% of GDP in 2013. Major export products include petroleum (55% of total export value), agriculture products (11%), and coal (11%) whose prices are largely determined on international markets. As a result, Colombia's economy is susceptible to external developments such as commodity price fluctuations and changes to the global financial situation.

The composition of exports has evolved over time with both petroleum and coal exports making up a larger share of total export value (Figure 3). Agriculture products, of which coffee exports make up about a third, had accounted for almost a quarter of total export value in 2000, dropping to 11% by 2013. In 2013, the share of extractive industries—petroleum and minerals and metals—had reached 69% of total exports.

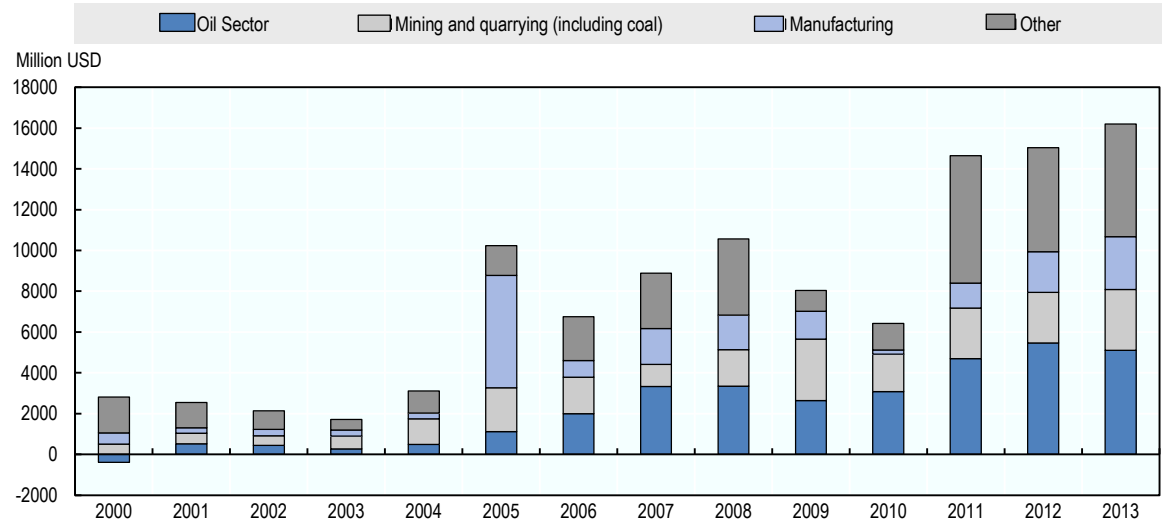
Figure 3. Export composition 2000 and 2013



Source: UN Comtrade, HS1996 nomenclature.

Improvements in the country's security situation and economic stability coupled with favourable commodity prices have led to dramatic increases in foreign direct investment. FDI increased seven times between 2000 and 2013. The principal sectors for investment were petroleum and mining which accounted for half of FDI flows during this period. The ratio of foreign direct investment in these sectors to GDP was 2% 2013 (Figure 4).

Figure 4. Foreign Direct Investment flows, Colombia



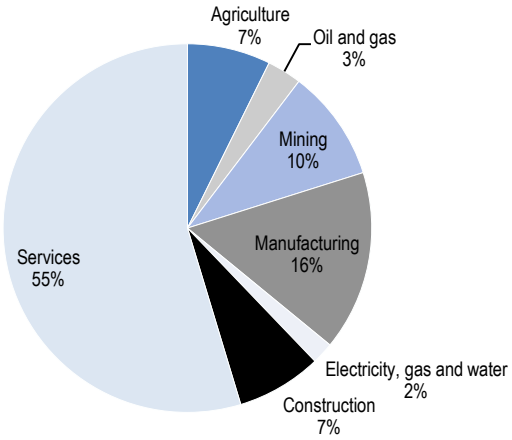
Source: Banco de la República, Colombia.

Peru

Peru is one of Latin America's top performing economies. Over the last two decades, Peru's GDP increased three fold in real terms and consistently outperformed other countries both within and outside of the region. Annual growth rates since the early 2000s average 5%, often well above the OECD average, and Peru managed to maintain positive growth even during the economic crisis (see Figure 1 above).

Peru's production structure is relatively diverse. While services accounted for over half the GDP in 2013 (Figure 5), manufacturing and mining activities are also important sectors of the economy making up 16 and 10% of the total added value, respectively. Agriculture and construction also contributed 7% each to the overall economic activity in the country.

Figure 5. GDP* by sector of activity



* 2013 estimate of added value in current prices.
Source: Instituto Nacional de Estadística e Informática (INEI), current prices.

Peru is a major producer in the mining industry. Rich in natural resources, it is Latin America's top producer of gold, lead, tin, and zinc, and is the third largest producer worldwide of copper, silver, tin and zinc (Table 1). The country also has abundant mineral reserves, notably of silver and copper.

Table 1. Peru a major global producer of metals

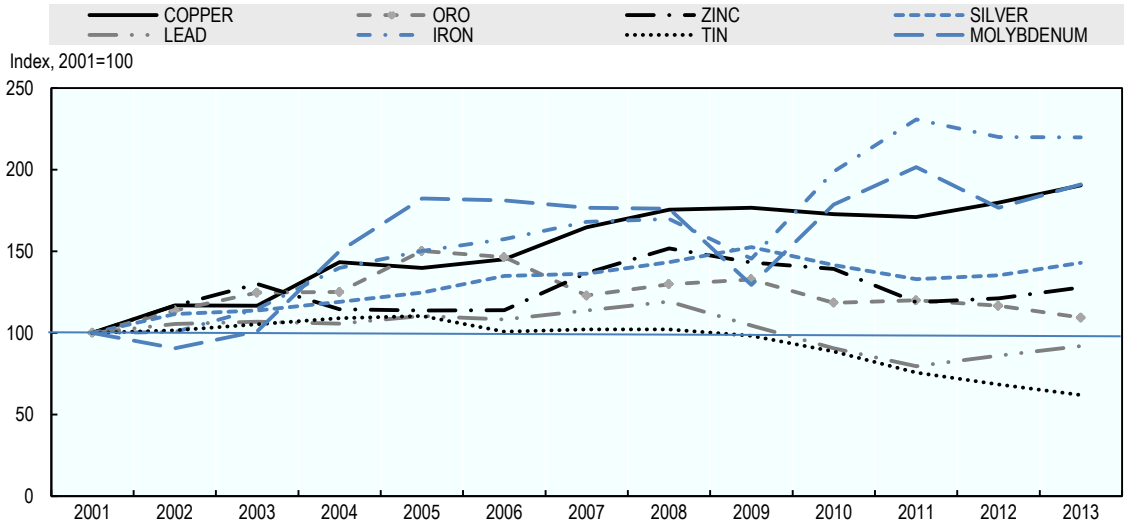
Metal	Rank in Latin America	Rank Worldwide
Copper	2nd	3rd
Gold	1st	6th
Lead	1st	4th
Silver	2nd	3rd
Tin	1st	3rd
Zinc	1st	3rd

Data refer to 2013.
Source: U.S. Geological Survey, Mineral Commodity Summaries, January 2015.

Mineral production in Peru increased for most commodities compared to 2001 levels (Figure 6). Copper production steadily increased over the period, almost doubling in volume between 2001 and 2013. Similarly, molybdenum and iron production exhibited strong growth which slowed in 2009 when commodity prices were in sharp decline. The end of the decade saw lower output relative to the period of high commodity prices in the mid-2000s. By 2013, production of gold, tin and lead declined between 11% and 39% from their levels in 2007.

Figure 6. Metallic mining production in Peru

Volume, 2001=100



Source: Author's calculation based on Peru's Ministry of Energy and Mines production data.

The mining sector is an important source of government revenue. At its peak, taxes from the mining sector accounted for a quarter of total internal tax revenues for the Peruvian government (Table 2). Tax revenue from the sector fell to 9.4% of the total tax revenue, partly due to the decline in the price of copper and some other metals.

Exports' contribution to the economy has always been robust: in 2012, exports amounted to USD 45.6 billion or 24% of GDP. Minerals and metals accounted for more than half (57%) of the country's exports.

The export composition has changed over time (Figure 7). Copper ores and concentrates accounted for 18% of the total export values in 2013, up from 2% a decade earlier. The gain in export share resulted from both an increase in production and world price. The enabling policy environment that has evolved in Peru has been very important as a backdrop to these changes (see Box 1). Exports of fuel also accounted for a larger share of exports in recent years, while the share of food products and textiles fell by half.

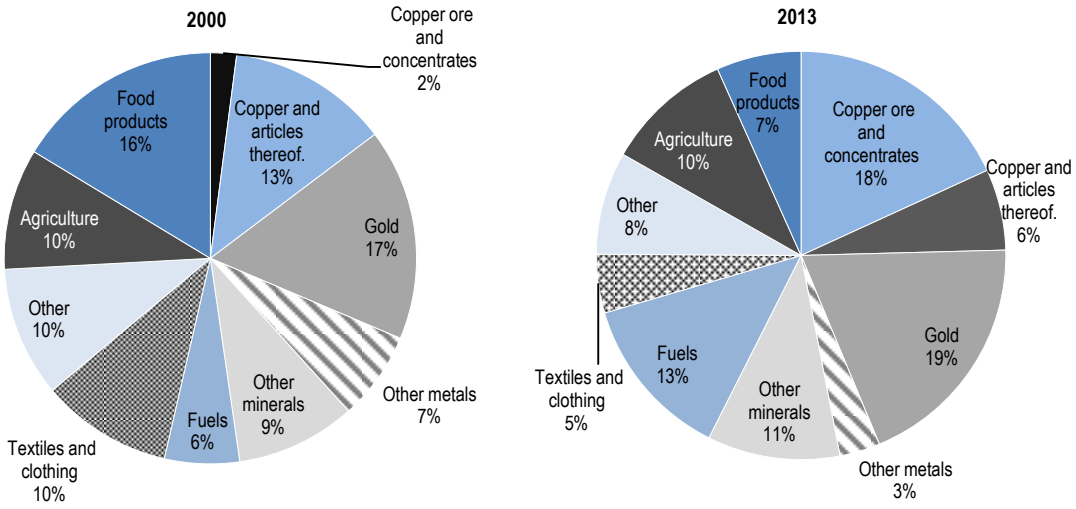
Table 2. Mining share in tax revenues in Peru

(Million Nuevos Soles)

	2002	2003	2004	2004	2006	2007	2008	2009	2010	2011	2012	2013
Total Internal tax revenues	18 707	21 349	24 018	28 002	36 941	43 616	46 956	45 420	53 521	64 206	72 463	76 683
Taxes from mining	689	1 092	1 741	3 123	7 731	10 761	8 985	4 859	8 132	11 258	10 633	7 181
Mining's share of total	**3.7%**	**5.1%**	**7.2%**	**11.2%**	**20.9%**	**24.7%**	**19.1%**	**10.7%**	**15.2%**	**17.5%**	**14.7%**	**9.4%**

Source: Superintendencia Nacional de Aduanas y de Administración Tributaria (SUNAT), Instituto Nacional de Estadística e Informática (INEI).

Figure 7. Export composition, 2000 and 2013



Source: UN Comtrade, HS1996 nomenclature, nominal value.

Box 1. Import substitution to trade openness in Peru: A historical view

Peru's economy has changed substantially in the last two and a half decades. In 1990 a change in government and economic policies was brought about by the most severe economic and political crisis in the country in recent times. Inflation in 1991 was 7650%; industrial production had fallen by 20% in two years (GATT, 1994). Public expenditure was severely curtailed due to a fall in revenue collection and the government's incapacity to borrow. Corruption was widespread and the presence of independence movements and growing terrorism by groups such as Shining Path and Túpac Amaru Revolutionary Movement represented a threat to the survival of democracy.

Peru, as many countries in the region, had followed a policy of import substitution for much of the previous decades. Tariffs were high as was tariff dispersion, implying even higher effective protection. In 1989, the simple average tariff was 66% (GATT, 1994). There were 56 different tariff levels from 10-84%. Additionally, 535 products were subject to export restrictions and 540 products, representing 23% of industrial production, were subject to an import ban (Webb et al., 2006). Multiple exchange rates and interpretation of restricted and banned imported goods left much discretion to customs officials thereby increasing the potential for corruption.

Starting in mid-1990, a comprehensive set of structural reforms was undertaken. Price controls were eliminated, most subsidies were removed, quantitative easing was progressively reduced and a managed, unified floating exchange rate was implemented. The tax structure was simplified and reformed. Peru's debt was restructured with foreign creditors which helped to increase confidence among potential investors. A new foreign investment law was introduced in 1991 which guaranteed foreign investors non-discriminatory treatment, free exchange convertibility and unrestricted rights to repatriate capital and profits (GATT, 1994).

The comprehensive reforms bore fruit. Inflation was substantially reduced to 57% by 1992 and single-digit later in the 1990s. Foreign investment slowly returned to Peru, principally to the manufacturing and mining sectors. Tax revenues increased from 5.8% of GDP in the first half of 1990 to 10.2% in 1992. The public sector deficit was reduced from 4.3% of GDP in 1989 to 1.5% in 1991.

Peru moved away from the anti-export bias in its tariff structure and moved away from import-substituting policies. Peruvian firms were subject to increased competition from foreign competitors. Peru's trade policy legislation was reformed substantially. Import procedures were simplified and accelerated which had the added benefit of reducing the risk of corruption. Post-reform, formalities could be carried out without employing dedicated customs agents. Anti-dumping and countervailing legislation was enacted in 1991.

The tariff structure in Peru was simplified and much reduced. Two tariff rates were applied: 15% and 25%. Eighty-seven per cent of tariff lines, representing more than 97% of imports, were subject to a 15% tariff rate. The average level of import tariff was reduced from 66% in 1989 to 16% by June 1993. In 1993, remaining tariff surcharges were suppressed. Export restrictions were abolished with the exception of the bilateral agreement with the European Communities under the Multi-fibre Agreement (GATT, 1994). Not only did Peru undertake comprehensive reforms to its trade regime, including unilateral liberalization, it also supported international efforts, in particular the Uruguay Round.

Peru's trade policy reforms have opened the country to trade and foreign investment. Trade has grown by 8.2% in real terms since the reforms were implemented, compared with 0.7% during the 1980s and 3.3% in previous decades (Illescas and Jaramillo, 2011). In other words, exports averaged USD 6.3 billion at the end of the 1990s to

an average of 28.8 billion in 2007-9. Much of this increase was in volume as opposed to rising international prices (Ibid). The volume of non-traditional exports rose by 300% over the two decades following the reforms. Foreign direct investment increased starting in 1992 whereas there were huge outflows in the late 1980s.

The substantial increase in trade was related to a strong increase in international reserves and overall relative macro-economic stability. According to statistics of the Peruvian Central Bank, international reserves have been multiplied by thirty-seven. Inflation has been low, averaging below 4% in the last decade. Public external debt is only 11.4% of GDP and government income has increased from 8.1% to 21% of GDP (Baracat et al., 2013).

Over the period since the early 1990s, Peru has increasingly engaged internationally, in particular in bilateral and plurilateral trade negotiations and, perhaps even more importantly, has leveraged these processes to implement trade reforms. The preferential trade arrangement granted by the United States to the Andean countries, United States Andean Trade Preference Act, was enacted in 1991. Peru joined the Asia-Pacific Economic Cooperation (APEC) in 1998. The Peru-US trade promotion agreement was completed in 2006. Since then, Peru has also negotiated and signed preferential trade agreements with Chile, Singapore, Canada, the People's Republic of China, EFTA, Korea, Thailand, Japan, Mexico, Panama, Costa Rica, and the European Union. Many of these FTAs have given political impetus to implement second-generation reforms in Peru and have provided Peruvian officials experience in different international arenas. They also incited Peru to articulate and communicate its economic and trade interests.

Peru's overall goal of increasing international competitiveness in order to expand its position in global value chains is clearly stated in its tariff policy strategy, published in 2006:

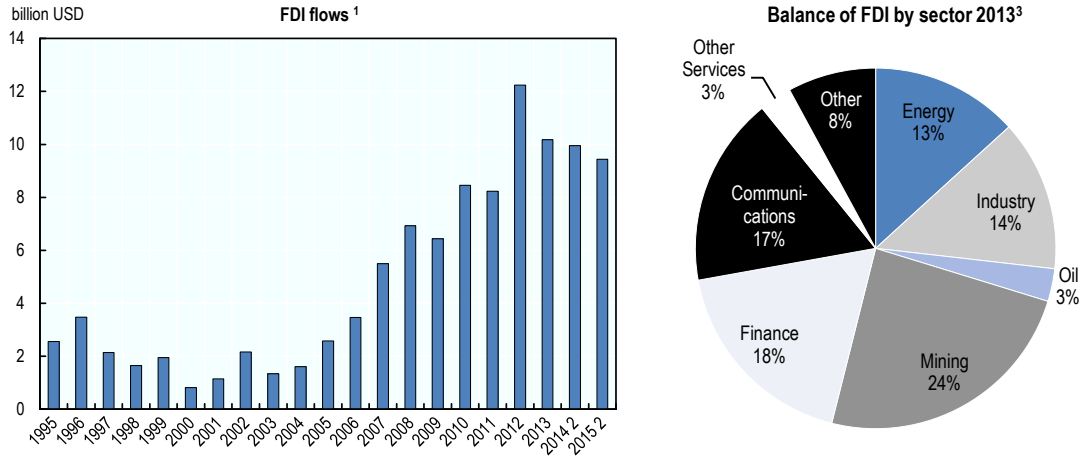
> From a standpoint of economic efficiency, the reduction of tariffs promotes improvements in international competitiveness, productivity of businesses and improvements of domestically produced products. All of this enables higher incomes and greater customer satisfaction. Higher tariffs isolate an economy from international competition and provide only a few sectors a boost at the expense of the economy's overall efficiency. Hence policy, particularly for a country with no power to influence international prices, should be to reduce tariffs and thereby their distorting effect on the efficiency of resource allocation. (MEF, 2006)

Peru's change in trade and other policies from import substitution during the 1970s and 80s to international engagement has been vital in its path toward economic stabilisation and strong growth.

Sources: Baracat et al. (2013), GATT (1994), Illescas and Jaramillo (2011), Ministry of Economy and Finance (2006), Webb et al. (2006).

Favorable macroeconomic conditions and improvements in the country's political stability, outlined in Box 1, have led to large inflows of foreign direct investments. FDI inflows have increased since 2000, peaking in 2012 at over USD 12 billion (Figure 8). By 2013 mining accounted for almost a quarter of the FDI balance. Financial services, communications, industrial and energy sectors also received substantial foreign investments.

Figure 8. Foreign direct investment

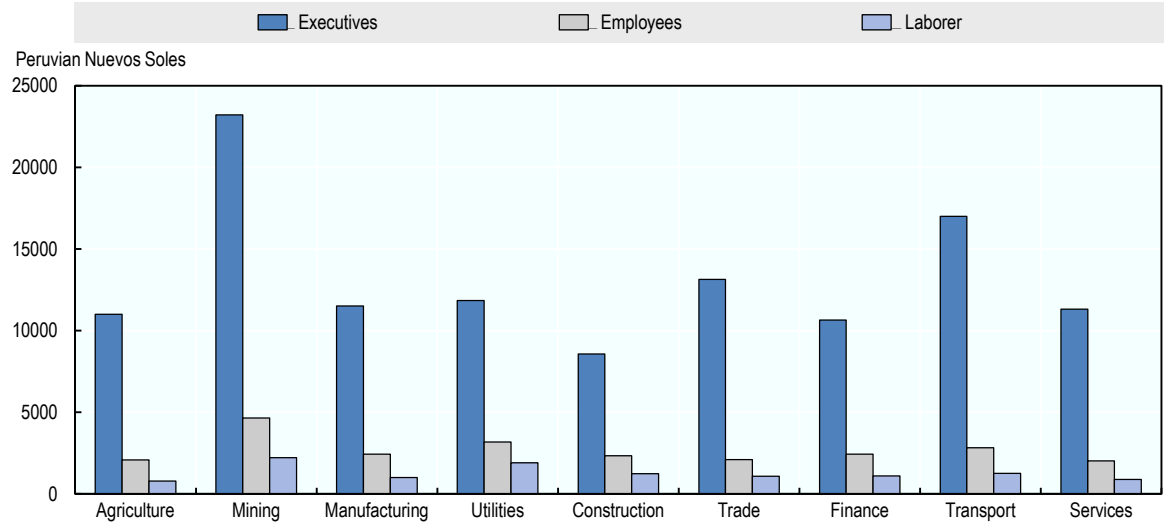


1. Includes reinvestment, contributions and other capital transactions, and net lending to the parent company.
2. Projection: BCRP Inflation Report - December 2013.
3. Includes contributions from abroad for social capital of domestic companies.

Source: Proinversion.

Jobs in mining accounted for only a small share of total employment: formal jobs in mining accounted for only 1.3% of Peru's occupied labour force in 2013. However, remunerations across all types of positions (executives, employees, or labourers) are consistently higher in mining than in other sectors (Figure 9). Average wages for mining executives are 36% more than executives in transportation, the second most highly paid sector. Compensation for labourers in the mining sector, on average, is almost double that in other industries.

Figure 9. Average nominal monthly wage by sector and employment position (December 2007) [1]



1. In enterprises with more than ten workers in urban areas.

Source: Ministry of Energy and Mining, Peru.

3. Taxation of the extractive industries

Colombia[1]

One of the ways in which natural resource-rich countries benefit from their resource endowment is through the taxation of those minerals and the firms that extract them. This section describes some of the main taxes applied to mining firms in Colombia.[2]

Mining firms in Colombia are subjected to five main tax instruments: corporate income tax; a pro-equity income tax (CREE); value added tax levied on the purchase of fixed assets; a wealth tax levied on business net wealth; and royalty payments.[3]

1. This section intends to provide a description of the main taxes used to extract revenue from the minerals sector in Colombia. It is not meant as a comprehensive study of taxation of the extractive industries. Issues such as transfer pricing, despite their importance, are outside the scope of this paper and would need to be covered in a more comprehensive context. For a more comprehensive coverage of the Colombian tax system and recommendations on how it can be improved, albeit not specific to the extractive industries, see *OECD Economic Surveys: Colombia 2015*.

2. Strictly speaking, Colombia continues to levy export surcharges on a few products: one of these is uncut emeralds. A 1% tax levied on the value of exports of uncut emeralds finances programmes to develop the industry and to finance social and economic development in producing regions.

3. Additional taxes that mining firms, as all other firms, are subject to in Colombia is the local real estate tax (*impuesto predial*), the tax and social taxes for explosives, the additional '*Super Sociedades*' tax on corporations and the national fuel tax.

Colombian corporations and other legal entities are subject to tax on their worldwide income, while foreign corporations and entities are subject to tax only on their Colombian sourced income. The general income tax rate for both Colombian and foreign corporations and other legal entities is 25%. However, if a foreign firm's Colombian sourced income is not attributable to a branch or a permanent establishment in Colombia, the rate is 33%.

Colombian income tax liability is calculated on the basis of two potentially different tax bases. Either the tax base is (i) profit after exemptions minus allowed deductions, or (ii) is calculated using a minimum presumptive tax base, whichever is higher. The minimum presumptive tax base is equal to 3% of a firm's net equity in the previous year. In the case a firm pays tax under the minimum presumptive tax base rule, it can carry forward the difference between taxes paid, using method (ii) above, and taxes due when calculated using tax base (i), until they are paid under the profit-based taxable base and for the following five taxable years maximum.

There are a number of deductions from the calculated income tax base in Colombia. The most relevant ones to the mining sector are the following:

- Royalty payments are deductible in the calculation of income used as the tax base for the corporate income tax and the pro-equity tax (Tax Code 107 and General Ruling no. 15766 of 2005)
- Exploration costs in the case of discovery of minerals. Unsuccessful exploration expenditure, or exploration which has not yet yielded a return, can be amortized in the year incurred or within the subsequent two years (Tax Code 142 and 143).
- VAT paid on imported machinery for basic industries such as mining.
- Tax depreciation of fixed assets, not including land, generally over a ten-year period for capital equipment and 20 years for immovable assets
- Payments to head offices by Colombian companies for management expenses or royalties
- Rental fees, payroll tax, social security contributions, and taxes on inputs such as import duties not otherwise refunded or credited.
- Voluntary investment made towards environmental enhancements or control if they have been accredited by the environmental authority. The deduction cannot exceed 20% of the taxpayer's taxable income.
- Income taxpayers who invest in projects qualified as technological research and development can deduct from their net income 175% of the amount invested. The deduction cannot exceed 40% of taxable income before having credited the deduction; however, the difference can be carried forward for the following years.

Non-incorporated individuals, including self-employed miners, are liable for individual income tax. The marginal rate is on a progressive scale from zero to 33%. However, a simplified minimum alternative tax (IMAS) has been introduced in the 2012 tax reform for low and medium income employees and self-employed individuals. The IMAS involves a simplified form and a grace period of six months after filing until taxpayers are eligible to be audited.

The 2012 tax reform act instituted a new "pro-equity income tax", the CREE, which has been in place since January 1, 2013. One of the reasons for the reform was to reduce the tax burden on formal sector jobs. The CREE replaced two previous payroll contributions for private-sector employees earning up to 10 times the monthly minimum wage.

The CREE tax rate is 9% through 2015 and will fall to 8% starting in 2016. The tax base used for the CREE is broader than the one used to calculate corporate income tax since most of the deductions permitted on corporate income tax are not allowed under the CREE. Royalty payments are also deductible from the CREE tax base.

Colombia levies royalty payments on products of the extractive and petroleum industries. The royalty is "compensation for the exploitation of a non-renewable natural resource property of the Colombian State" (Article 360 of the Colombian Constitution). Royalty payments are collected and administered by the Ministry of Mining and Energy. They are calculated on the basis of the value of mineral sales. For gold and silver, the price at which the metal is valued for the purpose of royalties collection is 80% of the average price during the previous month on the London exchange. Royalty rates range from 1 to 12% (Table 3).

Royalties collected for coal are progressive – the rate charged is higher for firms extracting more than three million tonnes annually.

Table 3. Royalty rate for different minerals, Colombia

Mineral extracted	Royalty rate payable on the value of production "at the mine gate"
Coal above 3 million tons production annually	10%
Coal under 3 million tons production annually	5%
Nickel	12%
Iron and copper	5%
Gold and silver	4%
Alluvial gold in concession contracts	6%
Platinum	5%
Radioactive minerals	10%
Metallic minerals	5%
Non-metallic minerals	3%
Construction material	1%

Source: Colombian Federal Law 756 of 2002, Article 16, www.sgr.gov.co/LinkClick.aspx?fileticket=68y2-RNV46g%3D&tabid=103.

In 2013, the royalties collected from the mining sector amounted to USD 800 million, equalling 15% of the total royalties collected. (The hydrocarbon sector accounts for the remaining 85%). Coal accounted for most of the royalty payments in the mining sector – 12% of all royalties in 2013.

Value added tax (VAT) is collected on all goods and services that are sold in country or imported. VAT is collected on the total value of goods and services at a rate of 0%, 5% or 16%.

Dividends in Colombia are taxed at the combined statutory corporate income tax and CREE rate of 34%. Dividends are not taxed at the personal shareholder level. Capital gains are taxed at a rate of 10%. Gains realised from the sale of certain assets including immovable property are taxed at lower rates or are tax exempt (OECD, 2015b).

Peru

Tax structure applicable to mining firms[4]

Mineral extraction firms in Peru are subject to five different tax instruments: (i) Corporate tax, (ii) Royalties, (iii) Special mining tax, (iv) Special mining levy, and (v) Employee participation in earnings. Corporate tax and employee participation in earnings apply to all firms operating in the country; royalties are paid by all firms which extract non-renewable resources such as minerals and gas; and the mining tax and levy are specific to the mining sector.

4. Information adapted from Ministerio de Energía y Minas (n.d), Sociedad Nacional de Minería Petróleo Energía (2013), APOYO Consultoria (2011 and 2014).

The corporate tax (*Impuesto a la renta*) rate is 30% of the profit before taxes and employees' participation in earnings and after payment of royalties. A tax reform package passed through Congress in December 2014 lowered the corporate tax rate to 28% in 2015/16, 27% in 2017/18 and 26% from 2019 onward. Firms in the mining sector are allowed the following deductions regarding corporate tax:

- Amortization of the acquisition value of mining concessions and exploration expenses over a term determined according to the probable life of the deposit.
- Deduction of the exploration expenses incurred in a single year once the mine has begun production, or its amortization over several years.
- Deduction of the development and mine-preparation expenses in a single year or their amortization over a maximum of three years.
- The possibility of deducting the infrastructure investments that constitute public services made by the mining firms from their net income.
- The possibility of applying a higher depreciation rate for machinery and equipment used for mining.

The mining royalty (*regalías mineras*) is a fee that the holders of mining concessions pay for the exploitation of metallic and non-metallic mineral resources. It is progressive and is determined by applying an effective rate, ranging from 1.0% to 12% depending on the operating margin, on the quarterly operating margin of mining companies. The resulting amount is compared to 1% of the quarterly sales, and the higher amount is paid. The amount of royalty paid is considered as an expense for the purposes of calculating corporate taxes.

Royalties in the mining sector have traditionally been calculated as a share of the value of extracted minerals or a fee per tonne of extracted ore. In Peru, however, it is based on operating margin. The question has been raised as to whether the Peruvian tax administration has the capacity to accurately evaluate the level of profits of large, oftentimes multi-national firms that have some flexibility in their accounting practices. In this regard, it is noteworthy that the Peruvian mining sector accounts for a small portion of the royalties paid. Although not strictly comparable since the system of calculation of royalties is different for mining as compared with hydrocarbons, the information in Table 4 suggests that the mining sector's contribution to the royalties take is largely below that of hydrocarbons despite its substantially larger share in economic activity.

The special mining tax (*impuesto especial a la minería*) is a progressive tax levied on the operating profits obtained by mining companies from the sale and own consumption of metallic mineral resources. This tax is determined on a quarterly basis, by applying the effective rate, ranging from 2.0% to 8.4%, on operating profits. The rate is established on the basis of the quarterly operating margin. The amount paid as special mining tax is considered as an expense for the purposes of calculating corporate taxes. This tax is applicable to firms without stability contracts since 2011. (Peru has implemented a system of stability contracts whereby firms are guaranteed a stable tax environment over a 10 to 15-year period, at least as regards income taxes. These contracts are described in greater detail in a subsequent sub-section).

The special mining levy (*gravamen especial a la minería*) is a voluntary and temporary surcharge that mining companies pay by virtue of agreements subscribed with the government. It is applicable only to firms with valid stability contracts signed before 2011 and who agreed to the application of this levy with the Peruvian government. The special mining levy applies only during the period that firms are protected by stability contracts; afterwards they are subject to the standard regime of special mining taxes (further details concerning the stability contracts are included in the next sub-section). This levy is calculated by applying the effective rate, ranging from 4.0% to 13.12%, on the quarterly operating profit of mining firms. The amounts paid as royalties are deducted from this levy.

Table 4. Contribution of mining and hydrocarbons sectors to total royalties envelope in Peru

Million US dollars

	2005	2006	2007	2008	2009	2010	2011	2012	2013
Petroleum	316	387	443	653	344	459	681	657	574
Liquid gas	199	247	290	397	431	696	893	781	905
Natural gas	27	37	58	81	84	162	418	457	454
Hydrocarbons - total	543	672	791	1 132	859	1 316	1 993	1 895	1 933
Mining	61	112	153	162	102	201	298	188	177

Source: PERUPETRO, MINEM.

Employees' participation in earnings (*participación de los trabajadores en las utilidades*) is a transfer by firms to their employees. Firms with more than 20 employees are required to distribute 8% of their annual taxable income before taxes to all of their employees, with a maximum limit per-employee equal to 18 monthly salaries. If there is a surplus, i.e. if 8% of a firm's profits exceeds its 18-month salary bill, this surplus is allocated to the *Fondo Nacional de Capacitación y Promoción del Empleo* (National fund for job training and job promotion) up to a ceiling. Over and above that threshold, the surplus profits allocated to the fund are attributed to regional governments for public-investment projects.

This unusual system of mandatory profit-sharing with employees at all levels, including those that cannot influence the strategic management of the firm, suggests that larger, capital-intensive, potentially highly profitable firms such as some mining firms will draw more desirable employees from more labour-intensive ones and from smaller, higher risk firms such as start-ups. It also implies that larger firms that are expected to make a large profit, such as some mining firms, can reward employees with lower salaries than corresponding firms in some other industries since they will receive substantial bonuses – up to 150% of their annual salary – in the form of the employees' participation in earnings. The wage bill of such firms may thus be lower than it would be without this policy, and their overall taxable base may therefore be higher. If this is indeed the case, they will pay more tax as their profits will be higher due to a reduced wage bill. Finally, it represents a risk-sharing factor between the firm and its employees — some of the volatility in revenue of firms in industries such as mining is passed off on the employees if their salaries are estimated using an average employees' participation package.

Dividends are taxed at a rate of 6.8% when profits are distributed to non-residents and individuals as of 1 January 2015. The previous rate was 4.1% and it will be further increased in the coming years. From 2017 the dividend tax rate will be raised to 8% and from 2019 to 9.3% (Ernst and Young, 2015).

The tax structure described above as regards the extractive industries is the result of a substantial reform undertaken in 2011. Unlike the previous scheme outlined in Box 2, the new system is built on the assumption that mining companies should be taxed based on their profitability: those with higher margins are subject to a higher effective rate. This reform was particularly relevant in the context of low commodity prices: the new system is ascribed with preventing sharp reductions in profits from causing substantial layoffs and decreased investment. Such a system, however, presents greater difficulties with respect to the ease of calculation by tax authorities. As was seen above, the amount of royalties paid by the mining sector has been relatively limited, in particular when compared with the hydrocarbons sector which represents a far smaller share of the total economy, although this is not only due to the calculation of the tax and royalty base.

Box 2. Tax system as applied to extractives in Peru: Pre- and post-2011 reform

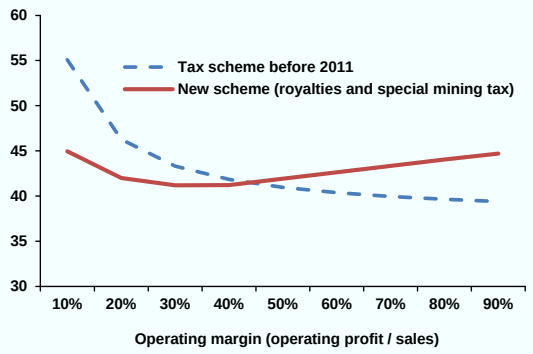
Before the 2011 reform, the tax system for mining firms was comprised of four components: corporate tax, royalties, employees' participation on earnings and a voluntary contribution towards social investments.

The former tax system included a 30% rate for corporate taxes and 8% for employees' participation; these two instruments remained unchanged in the new fiscal framework. The taxable amount and tax rate for royalties changed under the new system. Before 2011, royalties were calculated based on sales. The marginal rate for annual sales of USD 60 million or less was 1%; for sales between USD 60 million and USD 120 million was 2%; and for sales over USD 120 million was 3%.

The voluntary contribution toward social investments (*Programa Minero de Solidaridad con el Pueblo*) was started in 2006 as a response from mining firms to the intention of the government to increase taxes due to the sharp increase in international minerals prices and was considered to be temporary. The rate was 3.75% of net profit for firms that did not pay royalties and 1.25% for companies that paid royalties. The programme ended in March 2011; in June of the same year the new tax scheme was announced including, in particular, the special mining levy and special mining tax.

The figure below illustrates the change in the effective tax rate for firms with and without stability contracts. The change of tax system particularly affected firms with higher margins and no stability contract (left), as well as firms with a stability contract, since they had a flat and lower rate before the scheme changed.

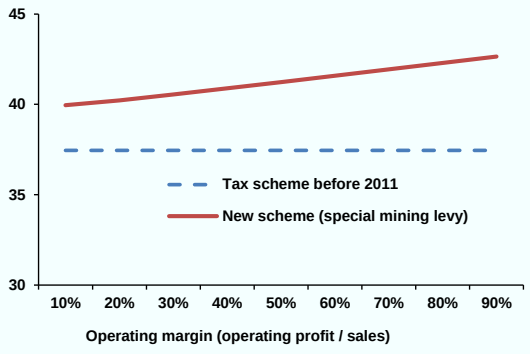
FIRM WITHOUT STABILITY CONTRACT:
TAX BURDEN OF A "MODEL" MINING COMPANY 1/ 2/
(% profit before tax, payments and contributions)



1/ We assume 70% of profit sharing through dividends.
2/ Taxes included are corporate tax, employees' participation, royalties, special mining tax and tax on dividends.

Source: APOYO Consultoria (2014b)

FIRM WITH STABILITY CONTRACT
TAX BURDEN OF A "MODEL" MINING COMPANY 1/ 2/
(% profit before tax, payments and contributions)



1/ We assume 70% of profit sharing through dividends.
2/ Taxes included are corporate tax, employees' participation, special mining levy and tax on dividends.

Source: APOYO Consultoría (2014b)

Mining firms' perceptions of the tax system can be considered rather neutral. According to the Policy Perception Index calculated by the Fraser Institute, Peru is ranked 56th out of 112 mining jurisdictions in terms of overall policy attractiveness.[5] Peru's tax regime is ranked 33rd out of 112 countries. Sixty-two per cent of the respondents considered the tax regime encouraged, or was not a deterrent to, investment; 9% considered the tax regime in Peru to be a strong deterrent to pursuing investments in the country.

According to some estimates, the mining sector in Peru may be subject to a higher tax burden than countries competing for investment in their mining sectors. Before the change in tax design and rates in 2011, the tax burden on mining companies was 39.4% of operating profit. [6] With the new system, the burden increased by nearly 3 percentage points.[7] In 2013, the average tax burden on a copper firm was 43% of operating revenue for companies without stability agreements and 42% for companies with agreements. Although difficult to compare across countries, these rates may be higher than those observed for comparable firms in some competing countries. However, the extractive industries contribute relatively less to total government revenues in Peru compared with some other Latin American countries (Appendix Figure 1).

Stability contracts

In order not to discourage firms from investing in the country because of the risks of a sudden change in the legal or tax schemes, Peru has two kinds of contracts that can be subscribed by mining investors in order to obtain legal stability for their investments: (i) legal stability agreements that are applicable to all private investors, including those investing in mining activities and (ii) stability contracts applicable exclusively to those investing in mining activities. Firms can subscribe to both contracts and enjoy their combined benefits as long as they meet the requirements for both.[8]

Legal stability agreements are arranged with ProInversión, the Peruvian government agency in charge of promotion of private investment. They guarantee that the corporate tax regime will remain unchanged for a term of ten years from the agreement's date of signing. Investors are guaranteed that they will not be subjected to a greater tax burden than the one they faced when they signed the agreement in terms of stability of investments, dividends, earnings and movement of funds. They are guaranteed free access to currency, free remittance of earnings, dividends, capital and other income and no discrimination in treatment of foreign and local investors. To qualify, investors must invest USD 2 million within two years from the date of signature of the stabilization contract.

Stability contracts are applicable only to mining activities in accordance with the General Mining Law (GML) and are approved by the Ministry of Mines and Energy. The 2014 tax reform instituted three types of stability contracts: for 10, 12 or 15 years depending on production and investment

5. The Policy Perception Index (PPI) is a composite index, measuring the overall policy attractiveness of the 112 jurisdictions in the survey. The index is com posed of survey responses to policy factors that affect investment decisions. Policy factors examined include uncertainty concerning the administration of current regulations, environmental regulations, regulatory duplication, the legal system and taxation regime, uncertainty concerning protected areas and disputed land claims, infrastructure, socio economic and community development conditions, trade barriers, political stability, labor regulations, quality of the geological database, security, and labor and skills availability. The PPI is normalized to a maximum score of 100.

6. Estimates for 22 companies and includes corporate taxes, employees´ participation on earnings and royalties.

7. Includes corporate taxes, employees´ participation, royalties, special mining tax and special mining levy.

8. Information regarding stability contracts and legal stability agreements is adapted from Ministerio de Energía y Minas (n.d), Sociedad Nacional de Minería Petróleo Energía (2013) and APOYO Consultoria (2011).

levels. They guarantee stability of the tax regime applies to corporate income tax rate, not including the withholding tax rate paid on dividends. They are also guaranteed tax exemptions, incentives and benefits that were in effect when the contract was signed for the duration of the period fixed by law. Stability contract holders are also accorded accelerated annual depreciation for machinery, industrial equipment, other fixed assets, buildings and construction in accordance with the General Mining Law (GML). These firms must invest at least USD 500 million and achieve a minimum capacity of extraction. In exchange for this stability, firms pay an additional 2 percentage points of corporate taxes (32% instead of 30%; 30% instead of 28% in 2015/16, etc.) during the period of validity of the stability contract.

It is worth noting that the special mining levy was an additional tax imposed on stability contract holders, although this was "voluntary". Stability contract holders could have chosen not to accept the new tax but they would have been subject to a higher tax rate after their stability contracts expired. Firms that have chosen to sign stability contracts despite the previous changes in the tax regime affecting stability contract holders, seem to have considered it more favourable to sign a stability contract and be open to renegotiation rather than being subject to unforeseeable and unexpected changes. Indeed, the tax structure has changed twice in the last four years: the far-reaching change in the tax design in 2011 moving to a system based on operating margins or profits as a tax base, and the December 2014 decrease in the tax rates for corporate taxes and increase in taxes on dividends and changes to the stability contracts. These changes have, however, been undertaken in consensus with stakeholders.

Private sector participation in public investment

Despite the steady growth in Peru and the increase in tax revenue that local governments in mining areas receive, there is a lack of basic services in mining communities. In 2008, the Peruvian government designed a mechanism called "*Obras por impuestos"* (OxI) or "Works for taxes" with the objective of accelerating and improving the quality of public investments. This mechanism allows private firms to finance physical infrastructure and maintenance expenditures under the responsibility of local governments in exchange for future tax credits. The amount invested in these projects annually by private firms can be recovered up to a ceiling of 50% of the previous year´s corporate tax. The mechanism was devised to allow mining firms that are substantial tax payers to ensure that their taxes are well spent.

The OxI mechanism is seen to have benefitted regional and local governments by increasing the execution of infrastructure projects, accelerating the local economic dynamism, using the know-how of private companies to increase the quality of their investments, and enhancing the reputation and image of local governments by helping them to reach their goals and objectives. The benefits for private firms are that their taxes are directed to generate social impacts, they develop corporate social responsibility programmes in collaboration with the regional and local authorities of the communities in which they operate, and they may improve their corporate image and reputation. Finally, the mechanism may benefit the community as a whole if it helps to accelerate the investment in infrastructure, improve the quality of public services and generate direct and indirect employment for the local population.

The main risk associated with allowing private firms to replace the local and regional authorities in the provision of public infrastructure relates to the extent to which firms can determine the priorities of subnational governments. Their own priorities and biases may tend to drive some types of investments, i.e. conflicts of interest, albeit projects must be approved by the regional or local government.

Equally important as the level of tax and its design is how the revenue from the sector is distributed and spent. The following section outlines the reform in the system of distribution of revenue from royalties from the extractive industries.

4. Distribution of revenue from royalties

Colombia

The Colombian government passed an ambitious reform of its royalties system in 2011. The reform, which was implemented starting in 2012, responded to two objectives: i) distribute revenue from State resources more widely and equitably, and ii) ensure more careful spending of revenue from natural resources (Ministry of Mines and Energy). It prioritised monitoring and oversight of the collection and spending of revenue from natural resources. It also oversaw the creation of a stabilisation fund to manage risks related to volatile commodity prices and smooth spending over time.

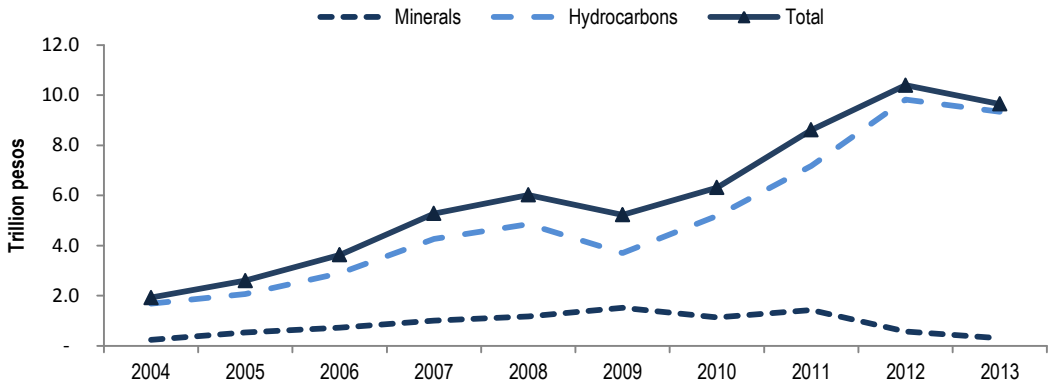
Royalties are paid by mining firms to compensate their extraction of non-renewable resources that are the property of the State. The revenue from royalties is also State property. The revenue from royalties has increased substantially in the past decade (Figure 10a). In 2013, revenue from royalties equalled 1.4% of Colombia's GDP. Revenues from hydrocarbons have accounted for between 70 and 97% of royalties paid in the last decade; mining has provided 3-30% of the total. In 2013, royalties paid were 9.6 trillion pesos, 97% of which was provided by the hydrocarbons sector (Figure 10b). Of the royalties emanating from the mining sector, 75-85% is typically provided from coal mining. About 15-25% is provided by gold, nickel and emeralds.

Before the 2011 reform, 80% of royalties were distributed to the regions where minerals and hydrocarbons were extracted; only 20% were distributed according to other criteria. Starting in 2012, distribution to regions rich in extractive resources was substantially reduced and criteria were revised in order to distribute the revenue in a more targeted and geographically diverse fashion. Prior to 2012, 80% of the royalties were distributed to regions that represented 17% of the Colombian population; in 2012, the same share, 80% of royalties collected, reached regions representing 70% of the population (Ortiz, Astrid Martínez, 2013). Despite the substantial contribution of revenue from royalties to regional and local governments in minerals and energy producing regions, they are among the least developed regions in Colombia. Indeed, poverty levels were higher than the national average in six of the eight regions that received the largest share of royalties by 2005 (Ministry of Mines and Energy). In La Guajira, for example, the region receiving the largest amount of royalties from mining before 2012, half of households did not have access to sanitation in 2009, 41% did not have access to a continuous water supply and only 67% of children under 17 attended school, compared with the national average of 85% (Ruiz and Ferro, 2013).

The 2012 reform aimed at improving the effectiveness of investment and infrastructure spending funded by royalties. Of the total package of revenue from royalties, 2% is set aside for administration and oversight of the distribution system. An additional 1% is used for monitoring, control and evaluation of projects (Figure 6). The emphasis on oversight and monitoring of expenditure, as well as explicitly accounting for the financial burden that it implies, was one of the major aims of the reform.

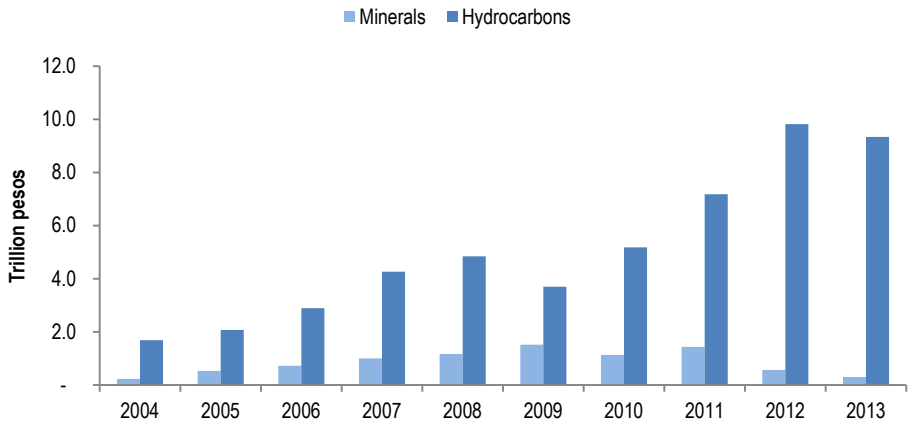
Expenditure to fund research and development of geological resources and geological mapping has also witnessed a substantial change due to the reform in the royalties' distribution system. Two per cent of the revenue from royalties goes to funding INGEOMINAS, the Colombian Geological Service. Investing in geological, geochemical and geophysical mapping of Colombia's resources represents an important step in leveraging Colombia's comparative advantage in extractive industries. Having comprehensive, detailed geological information will allow the Ministry of Mines and Energy to increase the efficiency of decision-making, including the granting and auctioning of mining and energy exploitation licenses and their monitoring, which will help to ensure future revenue streams from royalties. The availability of geological information is an area where Colombia has been lagging: only 53% of the country has been mapped using geological information, 28% in geochemical maps and 5% in geophysical mapping. Corresponding figures in Peru for example are 100% (geological), 50% (geochemical) and 60% (geophysical).

Figure 10a. Evolution of mining royalties in Colombia and breakdown by industry, 2004 to 2013



Source: ANH (Agencia Nacional de Hidrocarburos), ANM (Agencia Nacional de mineria)

Figure 10b. Evolution of mining royalties in Colombia and breakdown by industry, 2004 to 2013



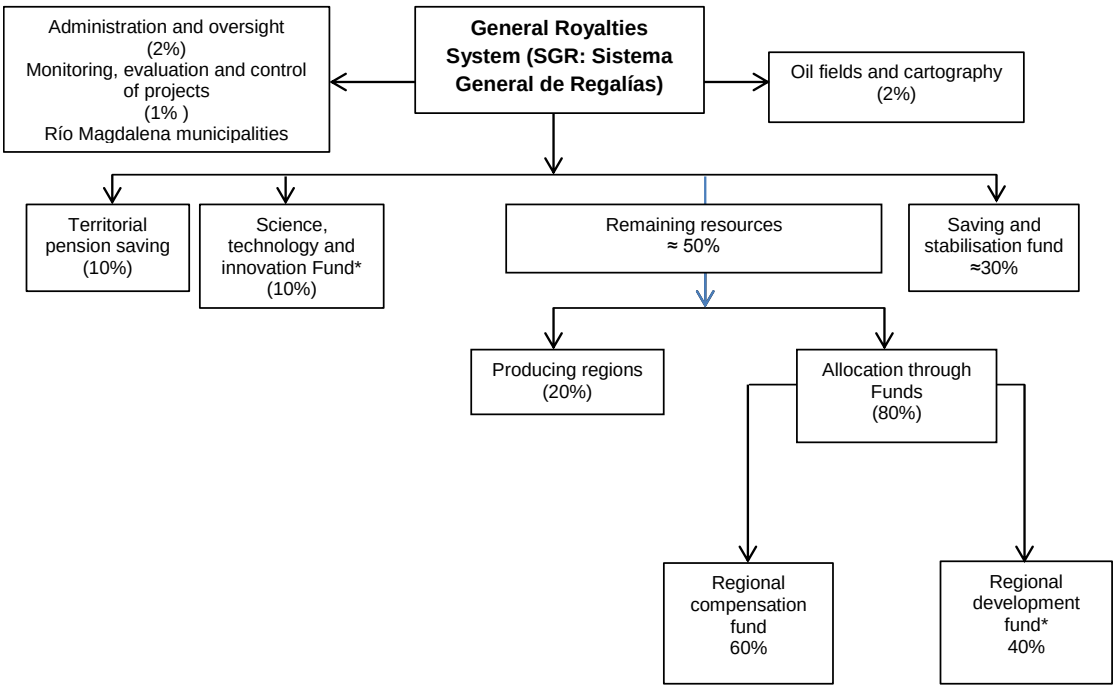
Source: ANM and ANH.

The availability of geological information is one determinant of the future of the mining and extractive sectors. Eighteen per cent of investors reported that the access to geological information, including the quality and scale of maps and ease of access to information, represented a strong deterrent or a reason not to pursue investment in the mining sector in Colombia. An additional 35% indicated that it represented a mild deterrent to investment in 2013 (Fraser Institute, 2013). Corresponding figures for Peru for example suggest that 4% of investors found the availability of geological information to be a strong deterrent to investment and 26% found it a mild deterrent whereas 22% found the quality and access to geological information to encourage investment in the country. Funding geological research will therefore aid in sector development and increase future government revenue, including future revenue from royalties.

The remaining expenditure envelope is distributed between funds created to oversee spending on infrastructure and investment projects; science, technology and innovation expenditure; and pensions. Half of the remaining budget envelope is disbursed between producing regions and two new regional funds that were created to invest mainly in infrastructure-related projects (Figure 11). The share going to producing regions has gradually decreased from 50% in 2012 to 20% from 2015 onward. In the medium term, therefore, the producing regions will obtain about 10% of the total revenue from

royalties in direct expenditure, compared to 80% before the reform. Although this has created some strong reactions from producing regions, with some regions suggesting they will no longer allow mining operations in their jurisdictions, it seems a more appropriate share of the revenue given that the underlying reason for payment of royalties is to compensate the State for extraction of non-renewable resources that belong to all of its citizens.[9] However, mining activities, and to a lesser extent extraction of hydrocarbons, create immigration into producing regions necessitating greater regional and local expenditure on infrastructure and social and municipal services. Any consequent demand for public services and infrastructure created by extractive activity should be included in an overall development plan which can be funded through the newly-created regional compensation and regional development funds in addition to the direct allocation funds.

Figure 11. Distribution of Royalties in Colombia, post-2012 reform



Source: OECD based on Acto Legislativo 05 (2011), Decree 0750 (2012) and Decree 4923 (2011).

The newly-created Regional Compensation Fund disburses 60% of the allocation to project-oriented funds (about 23% of the total royalties take or USD 1.1 billion in 2013) to Colombia's poorest regions. This envelope is distributed mainly for infrastructure and investment projects. The Fund is distributed to projects both at the regional (60% of projects) and departmental (40%) level. Criteria for regions qualifying for access to these funds are based on the Basic Unmet Needs index which combines indicators of poverty, population, and unemployment. Notably, six of the eight regions hosting extractive industries have Basic Unmet Needs that are higher than the national

9. The Ministry of Mines and Energy has implemented the Production Incentive Project which provides additional sources of revenue to producing regions in order to encourage extraction of non-renewable resources, contribute to sustainable development in those areas, and improve relations between local officials and mining and energy firms. A total of 180 billion Colombian pesos will fund projects through 101 local governments during 2015 and 2016. The Colombian authorities forecast that the impact on regional development will be significant.

average. It is expected that the Regional Compensation Fund will be combined with the Regional Development Fund in 30 years, i.e. spending will be available for all regions, if regional disparities diminish.

The remaining 40% of disbursement in the Funds for projects covering infrastructure and investment (15% of the total royalties envelope or USD 700 million in 2013) in the Regional Development Fund goes to all other departments. Anecdotal evidence suggests that a large proportion of these funds is accessed by departments with greater capacity to submit viable projects and greater knowledge of the process of project allocation, therefore potentially not those with the greatest needs. Lack of capacity in the project submission process is a recurring challenge for many sub-national governments.

A further 10% of the royalties revenue is allocated to a pension fund FONPET (*Fondo Nacional de Pensiones de las Entidades Territoriales*) which is administered by the Ministry of Finance. FONPET is aimed at guaranteeing pensions for sub-national public employees.

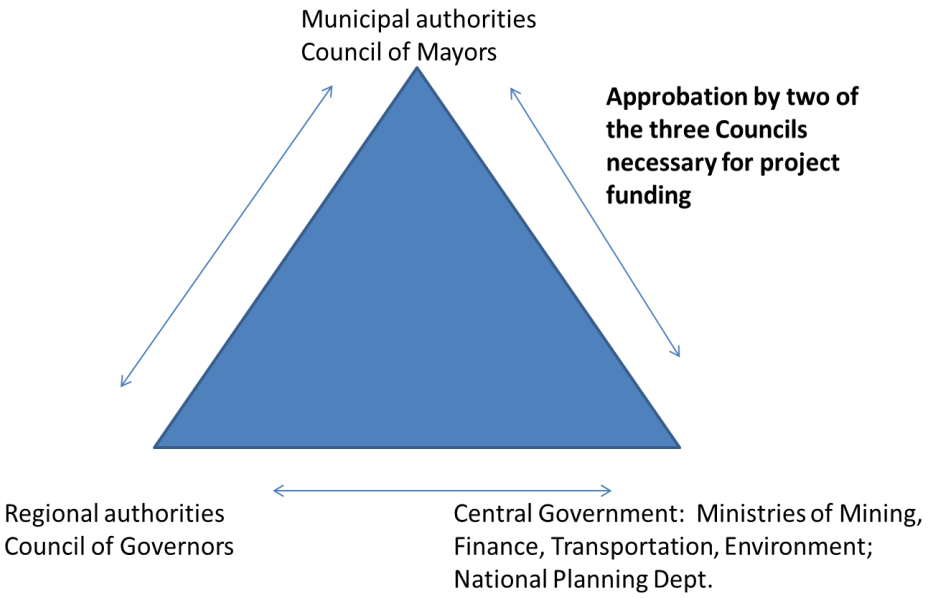
Finally, 10% of the envelope is available for projects covering science, technology and innovation (STI). Each region has its own advisory council for science, technology and innovation, normally chaired by the governor, with the participation of regional industry, research and education institutions and Colciencias, the national Department for Science, Technology and Industry. This allocation implies a significant increase in resources available for STI. In 2012, the amount of royalty spent on projects in the Science and Technology fund was USD 250 million or 40% of total spending on science and technology nationwide (www.sgr.gov.co and OECD, 2014a). The amount spent in the 2013-2014 envelope had already doubled as of the first quarter of 2014 confirming that resources flowing to science, technology and innovation have substantially increased.

Funds from the royalties system are allocated to finance investment projects presented by municipalities, departments, and other territorial entities. Selection of projects and their management is the responsibility of OCADs (*Órganos Colegiados de Administración y Decisión*), public-sector management bodies that exist at the local, regional and national level. Colombia's six regional OCADs are responsible for defining, evaluating, prioritizing and approving regional investment projects presented by territorial governments. They also designate the projects' executor. In 1 089 municipalities, local OCADs approve local projects presented mostly by mayors. Science, Technology and Innovation resources are allocated by a national OCAD composed by governors, universities and the National government.

A triangular system of local, regional and national involvement in decision-making regarding infrastructure investments aims to increase the efficiency of spending, provide oversight and provide opportunities for technical assistance from the national level in terms of project development and management. OCADs include representatives of municipalities, departments and the national government (Figure 12). Projects are proposed at the regional or departmental level, in the case of the poorest regions, and at the regional level in the case of the Regional Development funds. Local and regional representatives are generally mayoral and governor-led councils; at the national level, they are representatives from the Department of National Planning, the Ministry of Mines and Energy, Ministry of the Environment, Ministry of Finance, Transportation, etc. At the national level, representatives of Ministries are chosen as appropriate to the project (e.g. Ministry of Transportation for projects to develop the transport infrastructure), and one Ministry is named as leader. The Senate, Chamber of Representatives, and representatives from indigenous communities and other minorities also participate in the OCAD but cannot vote on decisions.

During the 2012-2014 period, 74% of the USD 9.3 billion available from royalties payments for investment has been allocated by the OCADs to finance more than 6 000 projects. In the case where an investment project presented by a sub-national entity is rejected by an OCAD, funds allocated to that entity are held in escrow, at the disposal of the sub-national government, which has to re-design a new project. Unspent funds from previous years are allowed to accumulate.

Figure 12. OCAD system of sub-national approval of infrastructure and investment projects



Stabilization and Savings Fund

A substantial outlay of the royalties' revenue goes to a Stabilisation and Savings Fund (FAE). Opened in August 2012, the fund aims both to stabilize the Colombian peso and, more generally, foster macroeconomic stability, and to save a portion of the rents from its non-renewable resources for future generations. The Fund collects up to 30% of the distributed revenue from royalties and is spent in a counter-cyclical fashion in order to maintain stability in spending of regional investment projects described above. It also aims to reduce the exchange rate volatility, and exchange rate pressure, that strong natural resource exporters often experience.

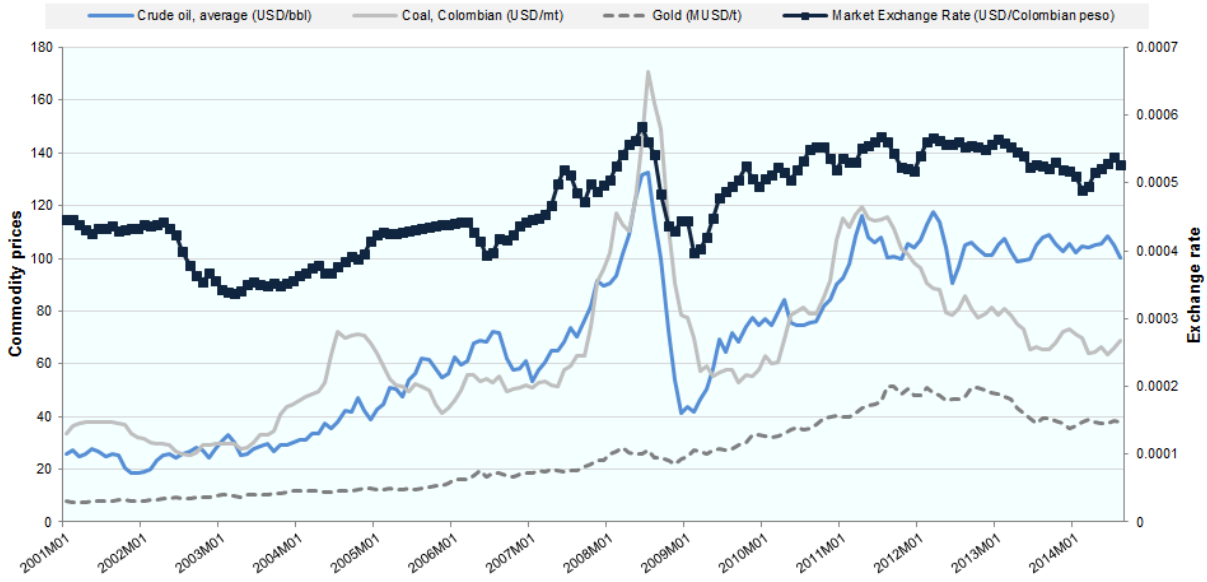
The vast majority of Colombia's exports are in natural resources: 70% of exports are hydrocarbons or minerals. Rising prices of oil or coal therefore put pressure on the Colombian peso. As natural resource prices rise and push up the exchange rate, Colombian exporters of non-extractives find it more difficult to remain competitive. In addition, as the extractive industries draw resources from the economy, they put pressure on prices and wages by increasing competition for skilled workers and inputs into production processes. Non-extractive industries exporters can be "crowded out" due to exchange rate pressure and competition for resources. This has often happened in Colombia whose exchange rate has typically been quite highly correlated with energy and minerals prices (Figure 13).

The increase in the real effective exchange rate as minerals and energy prices rise reduces the competitiveness of tradable non-extractive industries, such as manufacturing and agriculture. The increase in the real effective exchange rate as minerals and energy prices rise reduces the competitiveness of tradable non-extractive industries, such as manufacturing and agriculture. In particular, while the mining sector grew by more than 14% in real terms in 2011, non-mining tradable sectors have seen their competitiveness affected by the dual effect of a stronger exchange rate and higher input prices driven by the mining industry (OECD, 2014b).

In an attempt to counter this effect, the Colombian FAE invests 30% of revenue from royalties in foreign currency (USD). When oil and minerals prices fall, easing pressure on the exchange rate, a share of the accumulated FAE can be withdrawn to complement a shortfall in spending due to lower levels of revenue from royalty payments. In any given year, up to 10% of the last year's closing value can be withdrawn.

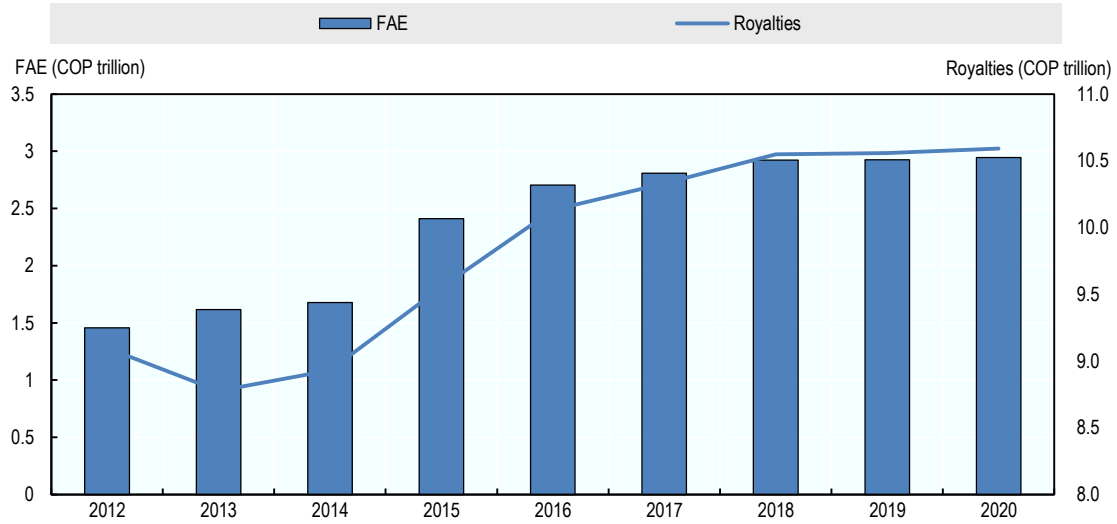
By 1st January 2015, the FAE had accumulated USD 2.5 billion. According to forecasts of revenue from royalty payments, 30% of which are to be invested in the fund each year, and assuming no draw-down of the FAE, it will have accumulated 24 trillion Colombian pesos by 2022 (USD 10 billion at January 2015 exchange rates) (Figure 14).

Figure 13. Colombian peso exchange rate and minerals and energy prices



Source: Exchange rate, Central Bank of Colombia. Prices, World Bank.

Figure 14. Colombia's Stabilization and Savings Fund: Forecast of annual inflows



Source: Medium-term Fiscal Framework 2012.

The FAE is managed by the Central Bank of Colombia and oversight is provided by an Investment Committee. The Investment Committee is made up of representatives of the Ministry of Finance, Ministry of Mining and Energy, the National Planning Department, all with voting rights, as well as the Chairman of the Central Bank, an auditor, two Governors and two Mayors, who do not hold the right to vote. The FAE objectives include adhering to the highest standards of sovereign wealth fund (SWF) management. Adhering to these standards, including in terms of transparency of portfolio holdings, returns and independent audits, will be key going forward.

The fiscal rule

A substantial share of revenue to Colombia's government is derived from the royalties and other taxes on its non-renewable resources—22% from 2009-12 (OECD/IDB/ECLAC, 2014). Moreover, exports of oil and minerals account for a strong percentage of Colombia's trade – 70% in many recent years. Changes in the prices and demand for a few non-renewable resource commodities can therefore introduce substantial volatility in funds available to the government. In the case that government spending follows changes in non-renewable resource prices, effects of this volatility will be exacerbated. Spending by the government should therefore be counter-cyclical, i.e. higher when revenue from non-renewables is lower - or at least constant, and dependent on overall macroeconomic conditions and the economy's capacity to absorb the spending without overheating. Researchers at the Central Bank of Colombia have found a positive effect on welfare of a counter-cyclical fiscal rule as opposed to a balanced-budget rule (Ojeda, Parra-Polania and Vargas, 2014).

In order to impose fiscal discipline and to separate government spending from revenues from the oil and minerals sectors, the Colombian government introduced the Fiscal Rule for Colombia (in Law 1473) in 2011. The fiscal rule applies to central government spending, i.e. not spending of sub-national governments. The fiscal rule has been modelled on the fiscal rule (otherwise referred to as the structural balance rule) that has been in place in Chile since 2001 (Box 3). It prescribes that the Colombian government must meet precise structural fiscal-deficit targets. Targets are defined in the Law and have been set in a decreasing fashion over the ten years following its inception. The fiscal deficit target has been set at 2.3% through 2014, 1.9% through 2018 and 1% as of 2022.

Box 3. Chile's fiscal balance rule

The structural balance rule was introduced in Chile in 2001 and raised to law by enactment of the Fiscal Responsibility Law in 2006. The structural balance rule involves estimating the fiscal income that would be obtained net of the impact of the economic cycle, and in particular of commodity price cycles, and spending only the amount compatible with the structural balance target defined by the Government. In practice, this means saving during economic highs, when revenues known to be of a temporary nature are received, and spending the savings in situations when fiscal income drops.

The structural balance indicator used in Chile calculates a measure of government revenue net of the cyclical impact of three variables: the level of economic activity and the prices of copper and molybdenum, a by-product in the production of copper. Thus the structural balance reflects the financial results that the central government would have shown in a particular year if GDP had been at its trend level and copper and molybdenum prices were at their estimated long-term level. It imposes discipline on government expenditure in times of high revenue intake, providing for stable sources of revenue during periods of low government income.

The structural balance rule is calculated using projected government revenue when copper and molybdenum prices are at the expected average price over a period of 10 years, and GDP growth is at a sustainable medium-term rate. These rates are determined by an independent panel of experts from the private and public sectors and academia.

Source: Korinek, J. (2013), Arellano (2006), Marcel and Vega (2010) and Rodriguez et al. (2007).

In Chile, medium-term growth forecasts and forecasts of the prices of copper and its by-product molybdenum are used to calculate structural revenues. In Colombia, a forecast of the price of oil is used to estimate medium-term non-cyclical revenues. Two committees consisting of independent experts are set up to provide estimates for the long-run growth rate of the economy and for commodity revenues. All available information on future oil prices is used. One of the most obvious challenges to

this methodology is forecasting the price of oil in order to estimate long-term, sustainable revenues from the sector. The government of Chile also experienced a similar challenge in attempting to forecast the longer term price of copper. Since the structural balance is determined using these forecasts, the forecast of the price of oil will strongly influence the amount of spending that the Colombian government will undertake, in keeping with the fiscal rule.

According to Colombian forecasts in use, no cycles are projected for the mining and energy sectors. The structural, long-term price of oil is currently set at USD 99 per barrel which was close to the average annual price over the first two years after its inception.

In the case where the growth in the economy or commodity prices in a given year are substantially higher than the long-run projections, in principle the excess revenue should be saved in the Stabilization and Savings Fund (FAE). In the case of lower growth in the economy (defined as 2 percentage points lower than long-term structural forecasts) or lower commodity prices, FAE funds can be used to finance smoothed expenditure levels in order not to exceed the fiscal balance targets.

Peru

Revenue recipients

The distribution of taxes between central, regional and local governments is specific to each type of tax. A decentralized fiscal system was implemented in 2001, distributing revenue between Peru's three levels of government: national, regional (among 25 regions) and local (at both provincial and district levels). The total tax revenue from mining, including corporate tax, royalties and special mining levies, was distributed among the different levels of government in the following way: 50% to the central government, 12% to regional and 38% to local governments.[10]

Mining firms in Peru paid USD 3.3 billion in taxes in 2013, or about 1.6% of GDP, 9.7% of the total tax revenue and 7.3% of total government revenue.[11] In the same year, the mining sector contributed 12.06% of Peru's total GDP.[12] [13] Total annual taxes are distributed by instrument in the following way: corporate tax (70%), royalties (6%), special mining taxes and levies (5%) and employees' participation in earnings (19%).[14]

Half of the corporate tax from mining companies is distributed to the subnational governments where the minerals are extracted - this transfer is called "canon" - and half is retained by the central government. "Canon" is distributed to regional and local governments in proportions determined by the Ministry of Economy and Finance based on population and basic needs criteria (Article 2 of the Law no. 28322). Canon is distributed exclusively to the regional and local governments where the minerals are extracted. Subnational governments are not obliged to invest the canon resources in the communities that are mostly affected by mining activities. The distribution is done in the following way (Figure 15):

10. Information taken from statistics of the Ministry of the Economy and Finance.

11. Information on GDP and total government revenue taken from statistics of the Banco Central de Reserva del Perú (BCRP). Information on taxes taken from SUNAT.

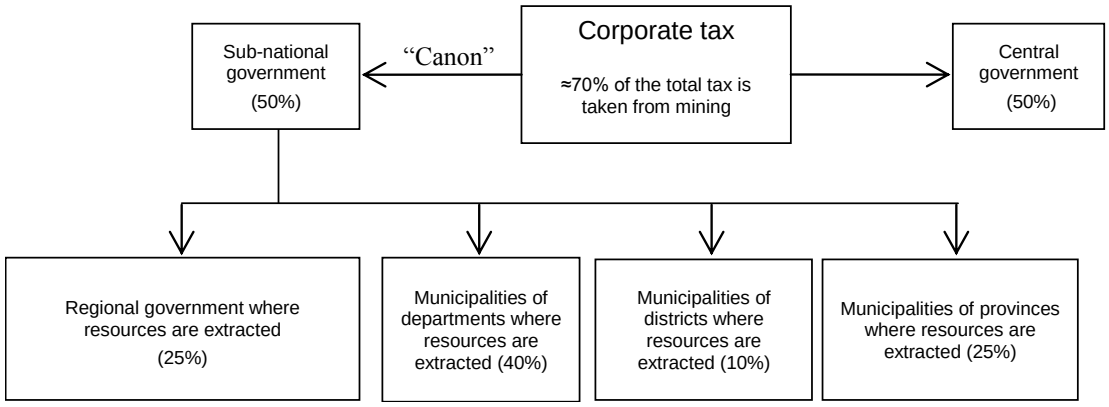
12. Banco Central de Reserva del Perú (2014).

13. As a point of comparison, in the last decade, Chile's mining sector represented between 11 and 21% of total GDP and taxes paid by mining sector firms and profit contributed by the state-owned mining company provided between 9 and 34% of tax revenue collected by the central government (COCHILCO, Anuario de Estadísticas del Cobre y Otros Minerales 1995-2014).

14. Statistics on internal taxes, SUNAT, statistics on government revenue, Ministerio de Economía (MEF), calculations by APOYO Consultoría.

- Local governments of the municipality or municipalities where resources are extracted receive 10% of the canon collected.
- Local governments of the province where resources are extracted receive 25% of the canon collected.
- Local governments of the department or departments in regions where resources are extracted receive 40% of the canon collected.
- Regional governments where resources are extracted receive 25% of the canon collected.

Figure 15. Distribution of corporate tax revenues from the extractive industry in Peru



Source: Author's illustration from information provided by the Ministry of Economy and Finance.

Revenue from royalties, accounting for 6% of the total tax revenue from mining, is distributed exclusively to the regional and local governments where the minerals are extracted, i.e. not to the central government or to non-producing regions. Unlike canon, there are some restrictions on how the resources must be invested in the communities that are most affected by mining activities. The distribution is as follows:

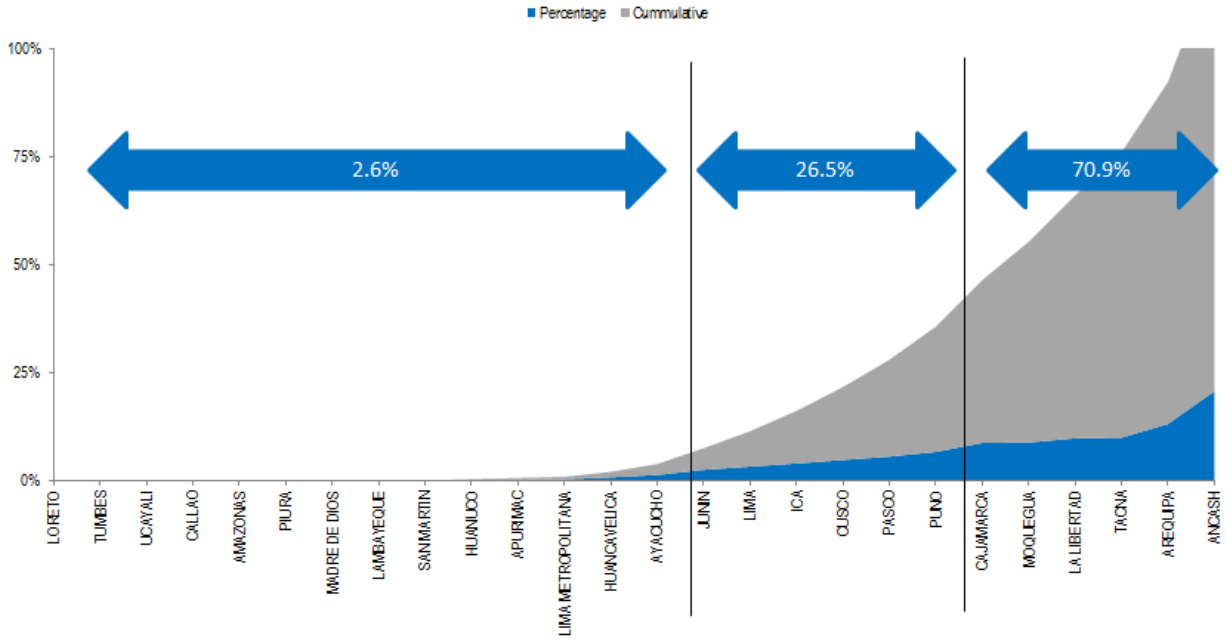
- Regional governments where resources are extracted receive 15% of the royalties collected.
- Public universities in the regions where resources are extracted receive 5% of the royalties.
- Local governments of the department where resources are extracted receive 40% of the royalties collected.
- Local governments of the province or provinces where resources are extracted receive 20% of the royalties collected.
- Local governments of the district or districts where resources are extracted receive 20% of the royalties collected, of which half must be invested in communities where the natural resource is extracted.

The special mining tax and special mining levy are collected and managed exclusively by the central government.

The resource distribution system described above is associated with a number of problems. Firstly, it increases the inequality among regions that are rich in natural resources and regions that are not. This problem also affects provinces that are adjacent to those with resources and receive much less than the latter. Some districts are negatively affected by the mining activities as they are part of the environmental influence area but are not considered part of the mining concession area. Perhaps most importantly, the distribution of both canon and revenue from royalties is highly fragmented making it difficult to finance large projects by local, provincial or regional governments.

The distribution of canon and royalties is concentrated in a few regions: 97% of the canon is distributed to 12 regions, and 70.9% is concentrated in only six regions (Figure 16). Although the revenue from royalties is distributed only to regions where mining activity takes place, the sub-soil resources, as in most countries of the world, belong to the Peruvian people.

Figure 16. Distribution of canon and royalties, Peru



Source: APOYO Consultoria (2014a).

Expenditure

The challenges encountered in undertaking and implementing public investment projects has been analysed in some detail (see Apoyo Consultoria (2014) for further information). Some of the problems identified in the project cycle of many public investment projects are summarized below:

- Inefficient use of the alternatives for project implementation: there is a preference for undertaking public works through direct administration and hiring instead of hiring an independent contractor. In 2013, almost 99% of the projects were implemented exclusively and directly by the public government. Other types of management of projects are widely unknown.
- Subnational governments lack qualified personnel to elaborate high quality pre-investment studies although this situation is heterogeneous among subnational governments.
- In certain cases, the land where the projects are planned to take place does not have legal status.
- Few resources are set aside for current expenses, including operation and maintenance of public investments.

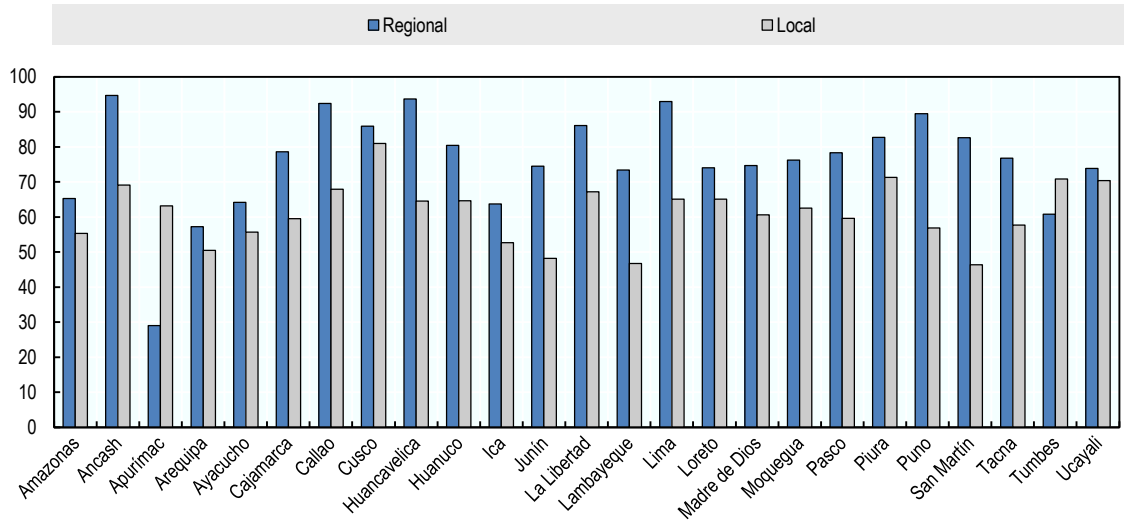
A major obstacle to efficient public expenditure is the small size of the projects. Several investment projects of small size are formulated instead of bigger projects that group similar smaller ones. In 2012, the average cost per investment project was USD 1.9 million at the national level; USD 2.4 million at the regional level; and a little more than USD 0.5 million at the local level. This is partly due to the fact that most subnational governments do not have enough capacity to manage simultaneously several small projects.

The management of bigger projects would allow better management of public investment as it would take advantage of economies of scale and contribute more efficiently in closing the infrastructure gaps. However, there are few larger projects managed by subnational governments.

In addition, the projects undertaken using canon funds are generally longer-term investments and require a stable stream of future revenue. The distribution of canon to sub-national governments in small and volatile amounts does not allow for needed long-term investments. The amount of canon and royalty revenues distributed to each sub-national government depends on the profit and production of firms in the region, province or district. This is difficult to forecast and sub-national governments in most cases cannot plan their income streams over multiple years. However, the canon and royalties revenues can only be used to invest in public infrastructure (75%), in the maintenance of public projects (up to 20%), and in the preparation of investment profiles (up to 5%).

Subnational governments therefore experience difficulties managing public investments due to the atomization of projects, volatility in revenue stream and the lack of required capacity to carry out substantial infrastructure projects. As a consequence, in addition to investing in low-quality and low-impact projects, subnational governments cannot spend the entirety of their budgets. In 2013, regional governments spent 76% of their resources and local governments spent 61% of their available resources (Figure 17).

Figure 17. Peru: share of budget expended by region, 2013



Source: Apoyo Consultoría (2014).

Corruption

Along with the increase of canon and royalties revenues transferred to subnational governments, corruption cases in regional governments have been more frequent. In 2014, nine regional presidents, out of a total of 25 regions, were accused in Peruvian courts of corruption. The most common charge was misappropriation of public funds involved in irregular concessions and public expenditure. Most of the regions involved have received sizeable transfers from canon and royalties. Thus, the substantial resources available from the extractive industries have triggered a number of corruption cases due to misappropriation of funds and illicit associations.

These corruption cases indicate that the system in place has yet to provide an effective mechanism of oversight of regional presidents and mayors. In particular, the difficulty in identifying corruption increases as the subnational government resources increase and as the atomization of projects continues. The National Control System, tasked with such oversight, is undergoing reform

with the objective of simplifying its procedures and adapting them to a decentralized situation. It is also looking for mechanisms to link control with incentives to subnational governments.

Another potential aspect of limiting the scope for corruption in regions that receive transfers due to mining activities and other natural resource exploitation is through transparency mechanisms such as the Extractive Industries Transparency Initiative (EITI). The EITI is a coalition of governments, private firms and civil society which aims to improve openness and accountability in the management of revenues from natural resources. Presently, 41 countries are implementing the standard along with Peru, the first country in Latin America to join the initiative. The EITI standard ensures full disclosure of taxes and other payments made by oil, gas and mining companies to governments which is made public in an annual report that allows citizens to compare how much their government is receiving from their country's natural resources with expenditures declared by the firms themselves.

Peru is currently a "Compliant" country, which indicates that it meets all requirements in the EITI standard. Each year, more firms have taken part in the reporting of revenues. The last report has included the disclosure of revenue received by each region from its extractive industries. Peru is the first country to disclose its earnings at the sub-national level within the context of the EITI.

The work of EITI is important as it indicates any irregularities between the payment and receipt of mining taxes and discloses the results publicly. The EITI reporting confirms disclosure by the Ministry of Economy which publishes the tax revenues received by the central and subnational governments and how they are spent. As has already been stated, some of the biggest challenges in benefitting from mining revenues are related to their distribution and the lack of capacity to efficiently spend them, as well as the escalation of corruption – problems that the EITI does not address directly.

5. Tackling mining occurring outside the formal sector

Mining is a traditional activity in some regions of the Andean community. Many countries are mineral-rich and minerals are found in some remote areas where there is little other economic activity. Traditional mining is generally done in small, family-owned or community operations. Gold mining is particularly prevalent in traditional mining activities. With the recent sharp increase in the price of gold, however, many non-traditional actors have invested the sector. The non-traditional miners are using more highly mechanized production processes. There is also a criminal element to some of the gold mining operations since, according to Colombia's Ministry of Defence, it has become more lucrative to mine gold than to grow cocaine.

Three types of mining activity have been differentiated outside the formal sector. Although some categories of formal, informal and illegal mining overlap, the following typology may be helpful to distinguish between the different types of mining that occur in countries of Latin America.

- **Informal mining**: refers to artisanal or traditional production units. These are generally families or small groups. They often live on or nearby their area of activity. They do not have an accounting structure, are not incorporated and do not keep inventory. Many do not possess the mining title for the land on which they mine.
- **Illegal mining**: refers to the fact that production units are operating outside a legal framework. They may be larger-scale operations and may use heavy machinery. They may employ substantial numbers of people. They do not own a mining title, are not registered as miners, generally do not pay royalties and taxes and have not registered in the ongoing process of formalization. Many illegal mining operations are undertaken in restricted areas or in riverbeds where mining is prohibited in Peru, for example.
- **Criminal mining**: has been a problem in many countries of the Andean Community. It can take many forms. On the one hand, gold mining has been used in money laundering of drug profits. Another common form of criminal mining results from extortion of small or medium-sized mining firms. Armed operatives demand a share of mining profits under threat of violence. Another form of criminal mining involves organized crime groups operating

production units. Workers are sometimes threatened or coerced into mining for local organized units; in this case, a variety of labour and human rights are not respected. Some criminal mining operations control access to inputs or machinery used in the mining operations. In Colombia, much of the criminal mining is thought to be controlled by organized groups like the FARC, ELN or Bacrim. The extensive network of these groups extends the reach of criminal mining in Colombia.

Colombia

The majority of economic activity in Colombia takes place outside the formal sector. The 2010-2014 National Development Plan noted that in 2009, over 60% of the Colombian workforce did not contribute to social security and were thus considered part of the informal sector. The scope of informality in the Colombian economy is among the highest in Latin America.

Mining is no different from other sectors in this regard and suggests many challenges. It has been estimated that 87% of gold mining takes place informally (i.e. without a mining permit, according to the Mining Census – *Censo Minero Departamental Colombiano* – undertaken by the Ministry of Mines and Energy in 2010-11). Firms are not registered, exploitation and environmental permits have not been issued, safety regulations are not enforced, taxes and social security contributions are not paid and labour, environmental and even basic human rights legislation is not observed. According to the 2010-11 Mining Census, 63% of mining firms operate without a mining title. Sixty-five per cent of mining firms do not pay royalties, most of them also operating without a mining title.

There have been moves to formalize miners in the past. It has been estimated that 40% of miners are now legal; in the past, only 10% were legal. This is particularly prevalent in gold mining. The World Gold Council estimates that 10-20% of gold is mined by artisanal and small miners worldwide but they account for 90% of the labour force. The definition of artisanal, small and medium-size miners differs between countries and has implications for policies that affect them (Box 4).

Box 4. How small is small? Artisanal mining in the Andean region

In most OECD countries, mining is undertaken by large, capital-intensive firms that, although often operating in remote areas, are strongly regulated. Some gold mining in South America takes place in a very different climate for a number of reasons: gold mining can be done at the micro-enterprise level (i.e. panning for gold), minerals can be found in abundance, there is a tradition of small mining operations in some countries, and some regions are remote enough to have little collective or government oversight.

Defining artisanal, small and larger-size mining firms implies differentiated scope for environmental, social and economic impact. Therefore, procedures and requirements applied to small, family firms mining on a small plot are not appropriate for large firms with thousands of employees. Definitions of different classes of miners and the requirements of each category are therefore important elements in the process of formalization.

In Colombia, there exists a category of miners that undertake gold panning ("*barequeros*") as defined in the Mining Code (Art. 155-157), which allows manual sand washing without the use of machinery to separate gold and precious stones. Such traditional miners are defined by the organization of their activity: they work alone or in a family unit or community, and they do not use any large machinery. Traditional miners are not obliged to comply with the same regulations as other firms. All other firms are required to comply with a full set of regulations regardless of the size of the firm and the potential for their environmental footprint. Therefore, a firm with a handful of employees operating in a very small area is compelled to comply with the same regulatory obligations as a large firm with thousands of employees operating a large, highly mechanized operation.[1]

In Peru, however, the regulatory requirements are different depending on the scope of activity. Firms are divided into categories of artisanal miners: small miners, medium-sized and large firms. Medium-sized and large firms have more stringent requirements and permits. In Peru, artisanal and small-scale miners are defined by the amount of material they extract per day and the amount of land they cover.

1. It should be noted that the Colombian government is in the process of developing a new decree on mining classification, as was set out in the 2014 National Development Plan. The aim is to clearly outline mining categories and the characteristics of each.

Box 5. Substance use in gold mining

In much of the Andean region, trace quantities of gold can be found in rivers or extracted from rock. Gold mining lends itself to small-scale and artisanal mining since the requirements for large machinery and capital are lower than for other types of mining. It is a traditional economic activity in many countries. There are three ways used to extract gold: gravimetric (physical) methods to separate loose alluvial gold deposits; using mercury, either on the ore or on concentrated mineral; and cyanide. The traditional activity of panning for gold has been transformed by the use of mercury to extract gold and silver from ore. In Colombia, mercury is used in virtually all small-scale informal sector gold mining. In many cases, mercury is used on the ore deposits, as opposed to the concentrated mineral, so large amounts of mercury are required and the outcome extracts less gold from the deposit.

An alternative method to extract gold makes use of cyanide. Cyanide used in mineral extraction can be fatal in case of human contact but dissolves in conjunction with ultra-violet rays. Using cyanide to extract the mineral is more efficient and less environmentally harmful, therefore, but requires formality, larger scale operations and an initial capital outlay. It has been estimated that informal mercury use recovers 30% of the gold contained in the ore whereas cyanide processes recover 70% of the gold content.

Mercury has devastating consequences for human health and for the environment. Mercury—also known as quicksilver – is an element found in nature in various forms. Because it is an element, mercury does not break down in the environment. Instead, it cycles between the atmosphere, land and water and can travel large distances from the original source. Mercury can also build up in humans and animals and become highly concentrated in the food chain. This is a problem since low levels of mercury exposure can build up over time until concentrations are high enough to be harmful. The United Nations Industrial Development Organization (UNIDO) suggests that 100% of mercury used in artisanal and small-scale gold mining is released into the atmosphere. Using mercury in a controlled environment on concentrated mineral, as opposed to the less processed ore, can reduce emissions by 70-90%. The controlled environment suggests greater formality, acceptance of safety standards, and initial capital outlays which is associated with larger scale operations than the traditional ASM unit of production.

The Minamata Convention on Mercury, a global treaty signed on 19 January 2013, was named after the Minamata disease, a neurological syndrome first discovered in Japan in 1956. The Minamata disease was caused by the release of mercury in industrial wastewater from a chemical factory. The local chemical and plastics firm dumped an estimated 27 tons of methylmercury into the Minamata Bay over a period of 37 years. The highly toxic chemical bioaccumulated in fish and shellfish in the Minamata Bay and when eaten by the local population resulted in mercury poisoning. Pollution was so heavy at the mouth of the plant's wastewater canal that a figure of 2 kg of mercury per ton of sediment was measured, a level that would be economically viable to mine. The high contamination levels in the people of Minamata led to severe neurological damage and malformations and killed more than 900 people. An estimated 2 million people from the area suffered health problems or were left permanently disabled from the contamination.

The Minamata Convention on Mercury aims to protect human health and the global environment from the adverse effects of mercury. It includes a ban on new mercury mines, the phase-out of existing ones, control measures on air emissions, and the international regulation of mercury use in ASM gold mining. The Convention calls for the elimination of mercury use in ASM mining in 20 years. Colombia, one of the 100 signatories to the Minamata convention, has passed legislation to outlaw mercury use in mining in five years, i.e. by 2018. Peru's objective is to ratify the Convention by 2015-16.

ASM miners in Colombia continue to use mercury. Colombia does not produce mercury but imported between 54 and 130 tonnes of mercury per year from 2006-10. Around 98% of imports were used in gold mining. Colombia's National Mercury Inventory shows 47 tonnes of mercury being released each year to the atmosphere—15 tonnes to water and 15 tonnes to soil as a result of gold mining activities (OECD/ECLAC, 2014). Analysis by UNIDO suggests that the release of mercury to the environment may be higher than estimated by Colombia – as much as 150 tonnes a year in ASM alone (UNIDO, 2012). The UNIDO report ranked Colombia as the world's third most contaminated country in terms of quantity of mercury released, even though it ranks 14th in terms of quantity of gold produced. Urban air concentrations of mercury in mining towns in Antioquia province averaged 10 µg/m3 in residential areas which ranked as the world's highest level of per capita mercury pollution. The highest concentration ever measured in the world was in gold shops in Antioquia province: 1 000 µg/m3. The World Health Organisation (WHO) limit for public exposure to mercury is 1 µg/m3 (WHO, 2007). The WHO limit for tolerable intake in long-term inhalation is 0.2 µg/m3 (OECD/ECLAC, 2014).

The concentration of mercury in some residential areas in mining provinces in Colombia are therefore 10 times the WHO limit for public exposure and 50 times the tolerable long-term inhalation levels. The total amount of mercury released into the environment is also very high, including when compared with the fatal levels in the Minamata Bay in 1956.

There are a number of reasons for implementing a process of formalization. One is that informal miners generally do not pay taxes, royalties or social security contributions. According to the 2010-11 Mining Census, 65% of mining firms (or "units of production") do not pay royalties. Among informal miners, the figure is 81%. The contribution to the collection of royalties by the mining sector is therefore taken from only 35% of mining firms, representing a substantial gap in potential revenue.

One challenge with formalization is that mining firms that are registered as firms, but that mine without a permit, pay royalties on their extracted product thereby allowing them to "legalize" the minerals they extract, without having conformed to regulation in place.

There have been many well-documented incidences of environmental damage due to illegal mining operations. Eighty-seven per cent of gold mining in Colombia takes place outside the formal sector (i.e. without a mining title) and virtually all informal sector operations use mercury to extract the gold from the rock or sand. Gold extraction using mercury in an uncontrolled environment, as is the case in most of the illegal mining sites in Colombia, is a serious threat to the health of communities in the area and to the environment on a potentially large scale (Box 5). In Colombia, 75% of mining operations do not have environmental permits; among operations that do not hold a mining title, the figure is 93%. Alluvial mining is particularly hazardous for the environment as chemicals and waste are carried downstream.

Formalization processes

The Colombian government has made a major push toward formalisation of the mining sector in order to better control and regulate mining activity. The 2012 National Plan for Mining Development outlines the steps necessary toward formalization. Formalization is viewed in Colombia as a three-level process: basic, intermediate and advanced.[15] The basic mandatory requirements are legal requirements to which are gradually added other requirements (technical, environmental, economic, fiscal, social and labour requirements) until reaching full legalization (Appendix II).

The formalization process is a lengthy and complicated one. Appendix II and III outline the steps and the relevant authorities that are necessary to engage in order to complete the formalization process. According to one count, formalization requires submission of 91 documents. However, 63% of miners working without a mining title are illiterate (Mining Census, Ministry of Mines and Energy, 2010/11).

Moreover, many informal mining operations are in remote areas. Appendix III outlines the agencies responsible for issuing permits and authorisations. Many informal mining operations are not located near the agencies that are responsible for issuing permits and authorisations making formalization difficult to complete.

One of the first level requirements in the process toward formalization is to register as a miner. The Register of Mineral Traders (RUCOM) was created by law 1450 of 2011and came into effect as of 1 January 2015.All buyers and sellers of minerals must be registered in RUCOM: it is illegal to buy or sell minerals from/to non-registered market participants. Artisanal miners are also obliged to register on RUCOM. As of 8 October 2015, the number of *barequeros*, traditional miners who extract minerals manually by sand washing without using machinery, registered in RUCOM was 87 500. Titleholders who were evaluated and published in RUCOM numbered 923 and certified marketers were 2120.

Perhaps partly as a result of the complexity of the process and level of education of informal miners, few have been fully formalized under this process. Under the National Plan for Mining Development process outlined here, 8 125 requests for mining titles had been submitted as of July 2013. Of them, 39% have been rejected and only one mining title has been granted. As of July 2013, 4 959 requests were still pending.[16] [17]

15. Política Nacional para la Formalización de la Minería en Colombia, final version, Ministry of Mines and Energy, May 2014.

16. *Política Nacional para la Formalización de la Minería en Colombia*, Ministry of Mines and Energy, May 2014, p. 17.

17. The Ministry of Mines and Energy has made some recent changes to its management of the formalization process. Recently, *Juntas de Formalizacion* (Formalization Boards) have established

It can be assumed therefore that many ASM will not accede to a mining title. There has recently been a policy to encourage mining title holders to engage with informal ASM operating on their territory. Before 2013, there was no way for a mining title holder to subcontract mining activity within the area covered by the title. A decree within the Law on the use of Mercury (decree 480 of March 2014), however, regulates the subcontract between the mining title holder and the ASM. The contract is an authorisation to continue exploitation of the area for no less than four years, with the possibility to extend the contract. The subcontract does not involve fragmentation of the title and the holder has the authority to execute audits and fiscal controls of the areas. The title holder does not have direct responsibility in the event of non-compliance with technical, environmental and security regulations in the area. Decree 480 defines the steps to obtain an authorisation from the mining authority for the formalization of subcontracts which are summarized in Appendix IV.

The formalization process through subcontracting has the advantage of grouping artisanal and small-scale miners around a mining title holder. The process somewhat simplifies the formalization of ASM who are linked by contract to the mining title holder who may be more apt to manage administrative compliance. The mining title holder however is not liable for the subcontractors operating within the confines of his title in the case they do not comply with environmental, security and technical regulations. Auditing of compliance with requirements thereby remains the responsibility of the mining authority. The responsibility for compliance with safety, environmental and technical regulations is therefore shifted from the title holder to the mining administration in the case of sub-contractors.

Strategies for combatting criminal mining

Criminal mining poses a particular problem that cannot be solved through formalization alone. Criminal mining in Colombia is often the remit of organized groups such as the FARC, ELN, and Bacrim. These groups have a large network and a strong presence in some, mostly remote, regions. They have been involved in drug trafficking for decades and have been attracted to gold mining due to the substantial rise in the price of gold in recent years and the potential for money laundering.

Money laundering takes place in a variety of ways. In some cases, drug operatives buy gold from small miners in cash. Sometimes they pay a premium that can be more than 10% above the local market price for gold. The drug operatives may then pay the royalty on the gold they have purchased in order to make the operation fully official. When the gold is sold, all of the revenue can then be accounted for through formal channels. It has also been suggested that some drug operatives pay the royalty without actually buying or selling any gold. If this is indeed the case, the amount of gold produced in Colombia may be overstated. On the other hand, some gold is bought in neighbouring countries (e.g. Venezuela, Ecuador or Peru) using illicit funds and sold in Colombia to a "front" mining firm.

Money laundering can also be performed by buying mining equipment using money from drug trafficking. The mining equipment can then either be re-sold, used in operations that are directly managed by organized crime groups, or rented to coerced (or not) miners.

Other insurgent groups use extortion at the mining site either by requiring a monthly payment, requesting a share of gross production, or demanding an in-kind payment for each machine that the miner uses. Anecdotal evidence suggests that these payments can be substantial. In the region of Antioquia, miners have reported that insurgent groups obtain between 1 and 3 million pesos (USD 540-1650) per month for each excavator found on an alluvial mining site (*Defensoria del Pueblo*, 2010, p. 176). One gold mine provided the FARC with a daily income of 120 million pesos (USD 65 000) (Ibid.)

in 11 department which are designed to increase coherence in the efforts of national and local authorities (mining, environmental and administrative authorities).

In order to combat criminal mining, a police agency was created in 2013, *la Unidad Nacional de Intervención Contra la Minería Ilegal* (UNIMIL), within the National Police, which works in conjunction with the Ministry of Mines and Energy. In the first half of 2014, operations to tackle criminal mining confiscated 322 kilos of gold (Source: National Police, Dept. of Police UNIMIL). This unit takes over from a previous interagency initiative that closed 595 illegal mines between January 2011 and July 2012 (OECD/ECLAC, 2014). It has been estimated by the Department of Defence, however, that a possible 10 000 illegal machines are still in operation.

UNIMIL's priority is to target restricted areas (reserves, national park areas) where environmental damage is most harmful. This includes alluvial mining which is prevalent in some areas. Gold mining has been targeted but also some mining of rare earth elements (REE) and coltan. Heavy machinery has been targeted in order to reduce the production capacity. Heavy machinery which costs thousands or over a million dollars located in remote areas can be assumed to be illegally obtained as traditional gold panning operators are unable to purchase such equipment. Other inputs into the production process have been targeted. Large amounts of petrol entering remote areas with few roads and cars, for example, can be assumed to be used in illegal mining production facilities. In accordance with Decree 2261, passed in 2013, all machinery imported into Colombia for use in mining operations is now equipped with a GPS facility to allow closer monitoring.

The problem of illegal mining exists in the Andean region as a whole, and efforts have commenced to address it, reflected by Decision 774 *Andean Policy to combat illegal mining* of 30 July 2012 by the Andean Council of Ministers of Foreign Affairs. This policy is aimed at optimizing the control and monitoring of the import, export, transport, processing and marketing within the Andean region and with other countries, of mineral ores and their products coming from illegal mining, as well as the machinery, equipment, inputs and hydrocarbons that are used in illegal mining.

Purchase of gold from miners is allowed only by Central Banks in some countries. Such a system, although putting the burden on Central Banks to conduct an activity that is not within their direct remit, has the advantage of rendering intermediate gold traders, who in some cases introduce a level of corruption, irrelevant. This was previously the case in Colombia. Over 20 years ago, it was forbidden to buy or sell gold to/from any organization other than the Central Bank of Colombia. The Central Bank had offices in mining areas and bought all gold mined by small, medium and large-scale miners. A similar situation exists today in some countries such as Mongolia, Mozambique or Lao PDR.

Alternative models to support small and artisanal miners

Small and artisanal mining exists in many countries. Its regulation and management, given the potential for environmental damage, problems related to worker safety, and the opportunities for rent-seeking behaviour given potentially substantial rents in remote areas, have posed challenges in other countries. Different strategies have been used for supporting and regulating small mining activities. In Chile, for example, a national mining enterprise is responsible for buying copper miners' ore, processing it, and selling it on the world market. The Empresa Nacional de Mineria (ENAMI) also provides technical assistance to small and artisanal miners, including financial assistance as necessary (Box 6).

By selling their copper ore to a centralized organisation, small and artisanal Chilean copper miners are shielded from potential non-transparent selling operations in remote mining areas, benefit from technical and financial assistance and from the economies of scale inherent in international export of large quantities of copper. Alone, no ASM miner could access the international market for copper at the price and conditions that ENAMI can negotiate. Illegal mining is not a major problem in Chile, which is a different situation from the countries of the Andean Community.

Box 6. Chile's management of small and medium-sized mining firms

In 1960, the Chilean National Mining Corporation (ENAMI) was founded to promote small and medium-sized private sector mining firms in Chile. ENAMI's role is to provide technical and financial assistance to miners and mining firms, buy the mined ore, process it and sell it on the international market. In this way, ENAMI benefits ASM by creating economies of scale in order to buy and sell on markets to which they would not have access individually. ENAMI is a state-owned firm but is, in principle, self-financed (www.enami.cl/).

ENAMI buys unprocessed ore from small and medium-sized firms at a cost that is determined on a yearly basis. The price at which ENAMI buys ore is publicly known and is determined by a panel of experts from the copper industry. About 2000 small private firms sell their products to ENAMI. The unprocessed ore is then refined in one of its five processing plants and its smelter. The processed product (cathodes and refined copper) are then sold on international markets.

ENAMI also supports small-scale miners by offering them technical assistance. This can be in the form of training or supplying machinery and equipment that are not owned by the small firms but are necessary to mining operations. ENAMI also provides financial assistance in the form of loans to allow small-scale miners to explore and identify new ore reserves, develop their facilities, purchase equipment, etc.

Production, purchasing, treatment, technical and financial support operations of ENAMI are spread along seven regions in Chile. Depending on the year considered, it is approximately the tenth largest copper exporter in Chile.

Source: www.enami.cl/english-overview/english-overview.html; Korinek, (2013).

Alternative models for organizing small and artisanal operations in remote areas exist, including in Colombia. Colombia's main agricultural export is coffee and the Colombian coffee growers have been associated for over 80 years. They benefit from research and development services, a guarantee that their entire harvest will be purchased at international market prices, rural extension services and financial incentives to increase productivity, and commercialization and value addition strategies that are only possible through a large organization such as the "Fedecafé" (Box 7).

Small and artisanal miners in Colombia would benefit from an organization that could provide technical and financial assistance and large-scale buying and selling operations with greater oversight. They will need some technical assistance to adopt new mining techniques that do not rely on mercury, in particular given that the use of mercury for mining will be prohibited from 2018. Larger-scale refining and processing operations could use more sustainable techniques and impose higher safety standards necessary to protect workers. Financial support will be necessary to construct larger-scale gold processing plants.

ASM gold miners in Colombia could benefit from centralized buying and selling with operations in the sometimes remote areas where gold is mined. A centralized office where miners could sell their ore at international prices would offer an alternative to the sometimes corrupt and even criminal gold transactions. Sale of gold in larger quantities by such an organization would also obtain more direct access to international markets and the potential for better price negotiation.

A larger structure could also offer technical assistance to ASM gold miners to access certifications for their product. Some firms, particularly those selling luxury products, aim to source their gold sustainably. Their potential demand far outweighs the current supply of certified sustainable gold, however, and their desire for secure access to large quantities of gold that has been sustainably mined suggests a market for better practices in gold mining (this issue is covered in greater detail in the following section). An organization, firm, or association that could support ASM miners in Colombia could improve the conditions for miners and promote a sustainable product more widely. ENAMI has provided some value added to small-scale miners in Chile; the Fedecafé has supported and promoted coffee growers in Colombia.

Box 7. Supporting small and artisanal coffee farming in Colombia: The Fedecafé

Since 1927 Colombian coffee growers have organized themselves through a representative organisation called the Federación Nacional de Cafeteros de Colombia or Fedecafé. The Fedecafé has a presence in every rural region where coffee is grown. A Fedecafé outpost, recognizable by the logo reproduced above, is present in the smallest towns and villages in remote coffee-growing regions of Colombia. The Fedecafé's mission is to represent and support Colombian coffee growers while guaranteeing the sustainability of the coffee growing business and the positioning of high-quality Colombian coffee.

The Fedecafé supports Colombian growers in areas such as research and development to optimize the costs of production and improve the quality of coffee, technical assistance to coffee growers through its extension services, and development of quality practices ensuring Colombian coffee growers receive market premiums. The Fedecafé guarantees the full purchase of growers' harvests at international prices, and commercializes and promotes Colombian coffee.

Research and development is undertaken in Cenicafé, the Federation's research centre responsible for the scientific innovation and technological development. Its work consists mainly of improving plant productivity, developing pest and disease controls, and improving the efficiency of inputs and labour. Cenicafé's findings are passed on to growers through technical assistance and technology transfer programmes by its rural extension service that employs 1 500 qualified technicians. Extension services also aim to improve productivity of coffee trees. The Fedecafé offers cash or in kind incentives to maintain coffee trees at their optimal level of productivity with the aim of optimizing coffee growers' incomes. The Fedecafé guarantees its members the purchase of their entire harvest at a publicized price that is based on current international prices through its network of 36 coffee cooperatives and 540 purchase points. In this way, the Federation aims to ensure that Colombian coffee growers receive the best possible price, and offers an alternative to potential intermediaries and speculators.

The Federation aims to add value and implements quality control of all coffee exported from Colombia. It develops campaigns for managing crops, pests and diseases. Value is added to Colombian coffee through commercialization initiatives such as the largest freeze dried coffee factory in the world and the trademark Juan Valdez coffee and coffee shops. It also adds value through advertising campaigns for Colombian coffee and its co-branding tool to link the coffee product to the grower through its triangular logo. Coffee roasters can apply for licenses to use the trademarked 100% Colombian Coffee logo for export which represents an added value for them.

The value-adding commercialization and technical assistance initiatives are financed through the National Coffee Fund. The National Coffee Fund is partially financed through parafiscal contributions by coffee exporters. Strictly speaking, this is an indirect export tax since only exports, and not domestic consumption, of mild coffee are subject to the contribution of USD 0.06 per pound. The "coffee contribution" is used however only for actions that benefit the coffee growing sector.

The Federation represents more than 563 000 coffee-growing families and is financed by its members. It has developed a complex infrastructure of federated representation that promotes collaboration and joint decisions. Its structure is based on coffee growers' representatives who have been elected at the local and regional levels. Every four years during the coffee elections, federated coffee growers elect their representatives to their National Congress of Coffee Growers, as well as to the departmental and municipal committees, the bodies that define the policies and programmes that will be executed within their organization.

Source: www.federaciondecafeteros.org; and OECD (2015a).

Peru

Description and extent of the problem

Mining activity taking place outside the formal sector in Peru is defined in one of two ways: illegal mining and informal mining (Supreme Decree No. 014-92-EM of June 1992). Illegal mining as defined in Peru refers to the activity of extracting mineral resources from deposits that belong to concessions registered to someone else. Informal mining is the activity that extracts mineral resources from areas that are not granted in concession.

Informal and illegal mining in Peru has increased significantly since 2005 due to the rise in the price of gold, which multiplied the profitability of illegal mining. Revenues from illegal and informal mining rose from USD 47 million in 2005 to over USD 1.8 billion in 2011 (Kossuth and Reiser, 2012; Macroconsult, 2012). Moreover, these activities have become increasingly widespread in economic, environmental, social and political terms (Kossuth and Reiser, 2012). There is illegal or informal mining in 21 of the 25 regions of the country, most predominantly in the regions of Madre de Dios, Puno, La Libertad and Piura. It employs around 100 000 people directly and another 300 000 who have economic or social links with these activities (Macroconsult, 2012).

Informal and illegal mining has become an important activity, both in terms of employment generation and tax evasion. According to the latest estimates available, in 2012 illegal and informal mining in Peru generated more revenue than drug trafficking - around USD 1.8 billion as compared to USD 1.2 billion. Over one million ounces of gold were mined outside the formal sector and tax avoidance is estimated at more than USD 300 million (Macroconsult, 2012). An average informal miner earns between USD 15 and USD 170 per day, depending on the amount of gold extracted, which is between one and four grams per day.

In some regions, illegal and informal mining is a substantial component of the economy. For instance, in Piura, illegal mining activity produces 170 thousand ounces of gold per year, valued at USD 285 million. To achieve those production levels, it created nearly 7 700 direct jobs compared to 1 300 created by the formal mining sector. Madre de Dios is another example. This region faces the worst social, economic, environmental and political effects of illegal mining. Conservative estimates indicate that 1 of every 3 ounces of gold produced in the region are mined illegally producing over 560 thousand ounces valued at USD 800 million (Macroconsult, 2012). Miners evaded paying over USD 170 million in regional taxes alone, i.e. half of the annual budget of the regional government (Kossuth and Reiser, 2012).

Besides the economic effects described above, informality has brought several problems ranging from environmental to socioeconomic damage to links with drug trafficking.

The most prevalent environmental problems are related to mercury pollution and deforestation. Incorrect use of mercury in the preparation phase of the amalgam and in its burning phase causes considerable emissions of mercury to the environment. In the last 20 years, it is estimated that more than 3 000 metric tons of mercury have been dumped into the Amazonian rivers polluting the water, flora and fauna, and human populations that breathe the mineral or consume the polluted water and fish (see Box 5 *Substance use in gold mining*). For instance, in the Madre de Dios region illegal miners produce between 16 and 18 tons of gold and require around 2.8 kilograms of mercury for every kilogram of gold that is extracted (SPDA, 2012).

In the Madre de Dios region, deforestation is another environmental problem caused by illegal mining. Between 1999 and 2012, deforestation due to illegal and informal mining increased from less than 10 000 hectares to over 50 000 hectares. In addition, the illegal mining in this region expanded from 2 166 hectares per year in 2008 to 6 145 hectares per year in 2012. Other environmental impacts are related to alterations of the landscape, accumulation of solid waste, contamination tailings and dust generation (SPDA, 2012).

The most important socioeconomic problems related to illegal mining are human trafficking, labor exploitation and child labor (SPDA, 2012). Gold mining is a risky activity and illegal conditions do not provide the required occupational safety. Children are involved in different stages of the mining process, mainly in hauling, processing with mercury for amalgamation, and searching for mineral remains. Other socioeconomic problems are related to the creation of improvised and crowded towns without adequate basic services that affect the health of the entire population living and working nearby. The high demand for labor, including unskilled labor, creates jobs, but they are precarious and informal with unstable revenues.

Other problems created by illegal mining are the links with drug trafficking, similar to those outlined in the preceding section for Colombia. Gold is bought by drug traffickers to launder the money they make with their illegal activity (SPDA, 2012) . Then, the gold that is bought is transferred to other countries to be cleared as tracking of its origin is lost. Also, some of the inputs utilized in gold production can be used to grow cocaine. According to Carmen Masias, DEVIDA[18] director, some chemical inputs used in illegal mining are diverted and put to use in cocaine production. Also, large capital flows from the Russian Federation and Brazil have been identified as important funders of illegal mining (Kossuth and Reiser, 2012). In order to prevent the police forces from entering the illegal mining areas, miners smuggle explosives and weapons.

Artisanal and small miners and their formalization process

Formal mining activities in Peru are organized in four categories: artisanal, small-scale, medium-scale and large mining. The categories are defined according to the scale of production: production capacity and size of the concession area. They are regulated by two types of mining rules that differ in their obligations in terms of the minimum annual production and the concession fee charged. Table 5 presents the characteristics of the four categories for legal mining (SPDA, 2013).

Artisanal and small-scale mining, in addition to the features listed above, are also defined by the use of equipment and materials and the need for a formal contract (SPDA, 2013). Artisanal miners cannot use the following equipment, machinery, inputs and installations: (i) dredgers and other similar devices that suck materials from the beds of rivers, lakes and streams for the purpose of extracting gold and other minerals; (ii) goods, machinery, equipment and supplies such as excavators, dumpers, compressors and pneumatic drills; (iii) installation and use of chutes, mills and pools of cyanide to process ore; pumps and other equipment.

In 2011, legislation was passed which paved the way for the first time for the destruction of machinery of illegal miners (Urgent Decree 007-2011 and Ministry Resolution 034-2011-EM). There is scant information regarding the results of these operations given their nature. In the first nine months of 2013, the military is said to have carried out 13 commando operations against illegal mines, destroying or confiscating 72 machines and other equipment.[19] In 2014, two operations are said to have destroyed USD 20 million of machinery and equipment used by illegal miners.[20]

The current Peruvian government aims to establish a series of regulations and procedures, in conjunction with the informal and illegal miners, in order to put an end to informality in this sector and the social and environmental ills it creates. These negotiations have lasted several years and are still in process, as most of the deadlines have been postponed due to the substantial political and economic power of informal sector mining associations.

18. Comisión Nacional para el Desarrollo y Vidas sin Droga (DEVIDA)

19. www.newyorker.com/currency-tag/whos-to-blame-for-perus-gold-mining-troubles

20. https://redaccion.lamula.pe/2014/04/30/quebrar-la-ley-para-combatir-la-informalidad/gabrielarriaran/

Table 5. Categories for mining activities, Peru

Parameters	Small and artisanal mining regime		General regime	
	Artisanal mining	Small-scale mining		
	Law 27651	Law 27651	Medium-scale mining	Large-scale mining
Production capacity	Until 25 metric tons per day	Until 350 metric tons per day	From 350 to 5000 metric tons per day	More than 5000 metric tons per day
	Until 200 cubic meters per day*	Until 3000 cubic meters per day**		
Extension of mining concessions	Until 1 000 hectares	Until 2 000 hectares	More than 2 000 hectares	
Minimum annual production	USD 25 per hectare per year	USD 50 per hectare per year	USD 100 per hectare per year	
	5% of a tax unit per hectare for any substance	10% of a tax unit per hectare for metallic substances	One tax unit per hectare for metallic substances	
		5% of a tax unit per hectare for non-metallic substances	10% of a tax unit per hectare for non-metallic substances	
Validity right	USD 0.50 per hectare per year	USD 1 per hectare per year	USD 3 per hectare per year	
Institutions in carge of promotion and supervision	Ministry of Energy and Mining		Ministry of Energy and Mining	
	Regional governments		OEFA	

* For gold exploitation in river.

** For gold gravel.

Source: Summarized from information contained in SPDA (2013), www.spda.org.pe/?wpfb_dl=14.

Illegal and informal mining syndicates have used their influence; there are several indications that they have benefited from the promulgation of certain laws and from the lack of implementation of others. The lack of strict implementation has aided in the proliferation of small miners and social tensions in the mining regions. Recently, there has been a new impetus to enforce legal process in the mining sector.

The formalization process for small-scale or artisanal miners stipulates six steps: 1) declaration of commitment, 2) certification of ownership, agreement or exploitation contract in the mining concession, 3) certification of land ownership, 4) provide an instrument of corrective environmental management. Upon the presentation of those requirements, the Ministry of Energy and Mines asks for approval for the use of water resources, the operation in the boundaries of national parks and others. The whole formalization process should take 125 days, according to the law (MINEM, n.d.).

There are different requirements for small-scale and artisanal miners as compared with large-scale. The main difference is the scope and procedure for undertaking the environmental impact study. The one required for large-scale firms is more comprehensive and requires more time to be approved by the authorities (up to 120 days, according to the law). Moreover, it requires active participation of the local communities and governments before, during and after the study is developed in order to be approved (MINEM, 2008). The impact assessment required for artisanal mining and small-scale firms is less detailed; for example, it does not require an economic assessment of the environmental impact of the project, and is approved in a shorter time (up to 50 days, according to the law). Moreover, civic participation is encouraged, such as through an ad in the national official newspaper, but active participation is not a pre-requisite.[21]

21. Manual de Legislación Ambiental. Participación ciudadana en la declaración de impacto ambiental. www.legislacionambientalspda.org.pe/index.php?option=com_content&view=article&id=602:participacion-ciudadana-en-la-declaracion-de-impacto-ambiental&catid=34:cap-4&Itemid=3812

A single window system was implemented in November 2013 to process formal applications. However, in 2013, the Ombudsman's Office audited the implementation of the process, indicating that several of the entities in charge did not accomplish their tasks (Defensoría del Pueblo, 2013).

The formalization process has had limited results, reflected in the lack of formalized miners: in April 2014, around 278 of 4 893 miners that have applied under the present process have presented the instrument of corrective environmental management and none of them have been approved yet. One important aspect that has hampered advances in formalization is the centralization of decision making systems and absence of regional governments in the implementation of procedures. Given the lack of engagement in the initiative, the government has extended the deadline for formalization initially planned for April 2014 for two more years, until 2016 (Romo, 2014).

In the two years since the new formalization process was introduced, only 15% of artisanal and small miners pledged to commit to the process (Zurita, 2014). The remaining informal sector miners are operating on existing concessions and would need either to negotiate with existing concession holders or to apply and be granted their own concession in order to formalize.

The potential for obtaining a concession, however, is rather limited: most of the mining concessions are already held. This does not necessarily imply that mining exploration or production activity is underway. In the past, concession holders could hold a concession forever (no time limit). Regulations concerning concession were recently reformed but even under the new system concession holders can abstain from mining activity without losing their concession for 21 years. In addition, the penalties are minimal for inactivity and only apply after a concession has been idle for seven years.

Table 6. Mining concession fees and penalties, Peru

Type of concession holder	Annual concession fee	Penalty if no activity in the last 7-15 years	Penalty if no activity in more than 15 years
Large and medium-scale mining ("*Régimen general*")	USD 3/hectare	USD 6/hectare	USD 20/hectare
Small scale mining	USD 1/hectare	USD 1/hectare	USD 5/hectare
Artisanal mining	USD 0.50/hectare	USD 0.50/hectare	USD 3/hectare

Source: INGEMMET, www.ingemmet.gob.pe/form/plantilla01.aspx?opcion=385.

Relationship between concession holders and illegal miners

One main reason that informal and illegal miners do not formalize their situation is the cost it implies in terms of the formalization process itself and the taxes they would have to pay if they formalize. As such, the formalization process is fundamental as it provides incentives to register and comply with existing regulations including those governing attribution of concessions. However, the process only applies to illegal miners who are mining deposits that are not in a concession.

Informal miners operate in existing concessions. In this situation, there have been two types of reactions from concession holders: i) accommodate these miners on their concession and find a peaceful alternative or ii) demand their withdrawal. The first case has occurred with bigger mining companies who prefer to strike a deal with miners exploiting resources from their concessions instead of risking a social conflict. One major copper mining operation, *Las Bambas*, started a formalization process for illegal miners operating within its concession with the Ministry of Energy and Mines. The firm offered to ensure the adequate tailings management in order to reduce pollution and aid in increasing the efficiency of the miners. Another example is from a mine in Ica where the company offered to buy the gold production from its illegal miners. That way, miners avoided the need for middle men and were ensured a better price and quicker sale than they could have otherwise obtained. These cases are not widespread however and the conditions of such agreements are variable.

The withdrawal of illegal miners happens more often in concessions granted to junior companies and to individuals that do not have the resources to allow squatters to exploit the minerals thereby reducing their future stream of income. When a compromise is not reached, there have been cases of miners engaging with local leaders and their communities to start a social movement against mining activities.

International ban on mercury

The Minamata Convention is an international initiative to stop the indiscriminate use of mercury and protect the environment and health of the population (see Box 5 *Substance use in gold mining* in the previous section). Peru was one of 100 countries to sign the agreement in October 2013 with a commitment to control the use of mercury in activities such as illegal mining (MINAM, 2013). The Presidency of the Council of Ministers emitted a Supreme Decree in 2014 for the Small-scale Mining and Artisanal Mining detailing its objective to ratify the Minamata Convention within 2-3 years after its adoption in 2013 (PNUMA, 2014).

One of the most affected regions, Madre de Dios, has developed plans for remediating the contamination of mercury due to artisanal and small-scale mining. These plans aim at reducing the health risk of mercury contamination, reducing their negative environmental impacts and restoring the affected natural resources (Ambiental, 2013).

The implementation requires a multi-sectoral approach involving the Ministries of Environment, Education and Health; the Regional Government of Madre de Dios and local governments. It includes the development of promotional campaigns and the sensitization and awareness about the dangers of pollution from mercury and other heavy metals in the population. The target audience includes urban and rural populations with special emphasis on the most vulnerable populations (pregnant women, children and members of indigenous communities). Likewise there is support for the promotion and dissemination of alternative technologies for mining production.

In March 2014, the Government implemented a registry for users of mercury and cyanide and increased the import controls of these inputs. These controls could have an effect on reducing the use of mercury but anecdotal information reveals that their impact has been limited.

Gold certification

On the one hand, the Peruvian government is keen to reduce the extent of the informal economy which is omnipresent in gold mining. On the other, demand for sustainable, traceable gold is growing. One way in which to contribute to motivating sustainable mining practices is to leverage the demand for sustainably mined gold through the supply chain. This requires defining standards for what are considered sustainable practices and methods of traceability and certification to document such practices. A number of initiatives exist in this area.

The Better Gold Initiative (BGI) implemented by SECO, the Swiss State Secretariat for Economic Affairs, aims to increase traceability and transparency in the gold value chain. This programme aims to match small producers directly with potential Swiss buyers such that middlemen are avoided in the transaction. In this way, small producers may sell their product at a premium, bypassing intermediate brokers. This could represent a substantial gain to producers as over half of Peruvian gold is typically exported to Switzerland. BGI does not, however, offer a premium to gold producers for their certified gold. It does, however, invest USD 1000/kg of gold for social and environmental projects through its CSR fund. BGI buyers purchase gold that has been certified by Fairmined or Fairtrade organizations. The challenge with this programme is that it uses certification processes that it does not control and to which it does not contribute.

Peru was the first pilot country in which the Better Gold Initiative was rolled out. Exports from Peru to Switzerland through the BGI commenced in September 2013. Four mining operations have been certified. In the first half of 2014, 350 kg of gold were exported through BGI. One tonne of gold is expected to be exported in 2015 through the programme. This is necessarily a very small portion of

the gold exported: typically, Peru exports around 170 tonnes of gold per year and 30% of its gold production is estimated to come from ASM. Once underway, it is hoped that the BGI will be expanded, with more miners and refiners certified as sustainable producers.

In October 2014, one of the largest Swiss gold refiners, Metalor, was certified to offer Fairmined gold. FLO-CERT is the international organization responsible for certification. The FLO-CERT certification confirms that a mining organization complies with Fairtrade and Fairmined standards and grants the authorisation to sell the product under Fairtrade and Fairmined labels. The certificate is valid for a period of three years, provided that mining organization continuously obeys the requirements of the standard. For most producers, there are two audits during the three year period. High risk producers, in terms of the complexity of their commercial processes or volume of sales, may be subject to additional audits.[22]

The Alliance for Responsible Mining (ARM) and the Fairtrade International organization are global initiatives focusing on the conditions in artisanal and small-scale mining. Their objective is to promote better social, environmental and labor practices, improve governance and implement ecosystem restoration practices (*Alianza por la minería responsable*, 2011). According to ARM, the benefits of fair-trade gold are that miners receive at least 95% of the international gold price plus a premium of an additional 10% over the gold price (15% if gold extraction does not involve toxic chemicals at all). The mining organization is required to invest the premium in development and community projects in technology, education, health and basic services. In order to be certified, a mining organization must comply with four pillars: i) social development: organizations must be formal and operate legally, they must have a democratic structure and transparent management; ii) economic development: organizations must have access to logistic, administrative and technical means to produce a quality product; moreover, they must strengthen their administrative and financial organization; iii) working conditions: it must provide decent work and avoid child labor, guarantee safety and right to form unions; and, iv) environmental development: organizations must handle responsibly and eliminate progressively their use of mercury and cyanide and must comply with environmental legislation.

The Responsible Jewellery Council (RJC) includes many major jewellery manufacturers and distributors among its members, thereby representing the retail end of the value chain. The RJC introduced its own certification in March 2012, aiming to trace gold from producers to consumers. The RJC is voluntary, however, and does not have an enforcement mechanism if firms do not comply. In September 2014, the RJC and the ARM have confirmed the integrity of the latest Fairmined Standard by officially recognizing it as a Responsible Mining Standard under the RJC Chain of Custody (CoC) Standard for precious metals.

The OECD's Gold Supplement to the Due Diligence Guidance for Responsible Sourcing of Minerals from Conflict-Affected and High Risk Areas provides recommendations for companies that wish to source their minerals and metals from conflict-affected and high-risk areas. The Gold Supplement contains specific measures to create economic and development opportunities for artisanal and small-scale miners, and invites all stakeholders to support legalisation and formalization processes in producing countries.[23]

The London Bullion Market Association (LBMA) has developed the Responsible Gold Guidance to avoid contributing to conflict, human rights abuses, terrorist financing practices, and in order to comply with high standards of anti-money laundering. This framework is mandatory for all refiners wishing to sell into the London Bullion Market, and is intended to assure investors and consumers that

22. www.flocert.net/es/servicios-fairtrade/certificacion-fairtrade/como-funciona/.

23. Colombia adhered to the OECD Council Recommendation on the OECD Guidance in May 2012, and has since then worked to support understanding of the Guidance and integrate its recommendations into national regulatory instruments. Outreach efforts with the government of Peru could begin in the second half of 2015.

all London gold stocks are conflict-free due to compliance with an audited, conflict-free process. The 63 LBMA Good Delivery Gold refiners include the preeminent refiners of gold internationally with an annual production making up 85-90% of world gold production. Compliance with the guidance is reviewed annually by independent auditors and results are submitted to the LBMA, as well as being made publicly available. The Guidance is based on the OECD Due Diligence Guidance, as well as existing practices in Good Delivery refiners aimed at combatting money laundering and terrorist financing.

The World Gold Council has developed the Conflict-Free Gold Standard (CFGS), to help companies involved in the extraction of gold provide assurance that their gold is not contributing to conflict. This voluntary Standard has also been developed to support refiners in meeting the requirements of the LBMA Responsible Gold Guidance. Companies are required to report their conformance with the standard over a 12-month period. Companies can identify suitable external assurance providers, who need to meet the criteria contained in the Standard. However, the World Gold Council does not act as a certifying body.

The Andean Community of Nations has addressed the issue of illegal mining since 2012. In 2012, member countries approved a political decision against illegal mining, which includes a cooperation mechanism to eradicate this activity as well as the protection of the environment and natural resources. The Decision 774 - Andean policy in the fight against illegal mining[24] includes the following measures: confiscation, demolition and neutralization of machinery and inputs used in illegal mining; exchange of information to identify illegal miners; tackling money laundering and crimes related to illegal mining; strengthening of control mechanisms; and execution of operations against illegal miners with coordinated actions at the borders, among others. In 2013, 65 delegates met in Ecuador to identify the mechanisms of prevention and cooperation however concrete actions have yet to be implemented.

6. Policy implications: Lessons from Colombia and Peru

In a number of ways, both Colombia and Peru have moved toward a better system of management of the minerals sector without relying on distorting trade policies such as export restrictions to implement them. Some of these policies may provide food for thought for other natural resource exporters. Challenges remain, however, and some of these are highlighted below.

Both Colombia and Peru have experienced strong growth in recent decades. They both have put into place a relatively open trading regime with a minimum of distortions. Peru in particular has moved from a regulatory framework that favoured import substitution in the 1980s to an open trade framework today. Reforms undertaken in the 1990s and 2000s to fully engage in global markets and increase competitivity of Peruvian firms is to be commended. Colombia has also been evolving toward an economic framework guaranteeing greater stability and security. In both Peru and Colombia regulatory frameworks do not include distortive trade policies such as export restrictions. Both countries have endeavoured to address through other policies overarching objectives such as sharing the benefits of the extractive industries economy-wide, enabling spillovers from extractive industries into other sectors and stemming the trade of illegally mined metals.

One important way in which benefits are extracted from natural resources is through tax revenue and royalty payments. A balanced and well-designed tax system ensures that resource rich economies benefit from their endowments without resorting to sub-optimal distortive policies such as export restrictions to generate the revenue necessary to cover public expenditure. Despite the substantial size of the Peruvian mining sector in its economy (60% of exports), the minerals sector only provided 8% of royalties, as compared with 92% by the substantially smaller hydrocarbons sector. Royalty

24. Decisión 774: Política Andina de Lucha Contra la Minería Ilegal (2012).

payments made by the mining sector represent about 15% of total royalties collected in Colombia (85% are provided by the more substantial petroleum industry).

Progressive tax and royalty rates have the advantage that when commodity prices are low, firms are taxed at a lower rate; and they are taxed at a higher rate when prices are high. In Peru, the reform of mining taxes and royalties undertaken in 2011 moved toward a progressive system. The tax instruments specific to the extractive industries, i.e. the royalty, special mining tax and special mining levy, are all calculated on a progressive scale depending on firms' operating margins. Progressive taxes serve to tax firms more when their profits are higher and less when they are lower, for example due to volatile prices of raw materials.

Taxes and royalties calculated on the basis of value or profit can be more difficult to calculate, however, than those based on the value or volume of sales. Moreover, tax authorities can face challenges in verifying whether the prices used by companies appropriately reflect arm's length prices. In Colombia, royalties for gold and silver are calculated using a method that is transparent and relatively easy to determine and audit. The value upon which the royalty is calculated for gold and silver is based on 80% of the average price in the previous month on the London Metals Exchange. There is therefore little potential negotiation or discussion of the value of the metals on which the royalty is paid and its calculation is easier to apply and to audit than, for example, one based on profit or subject to local market conditions. But this has the disadvantage that it is a 'blunt' approach that does not take into account the particular facts and circumstances facing companies.

Overall, if an industry is taxed in ways that appear sudden or ad-hoc, investors will be discouraged from participation. If it is taxed too little, however, the contribution of that sector's tax envelope to the overall government revenue will be smaller thereby contributing less to the government services that benefit the population overall. Moreover, revenue settings that are unreasonably low can raise domestic pressure for renegotiation. In Colombia, the extractive industries (mining and petroleum) provided 22% of tax revenues in 2009-12, up from 17% in 2005-8. In Peru, the mining sector contributed 9.4% of the total tax revenue in 2013. This was down from 25% in 2007 when copper and other commodity prices were particularly high. In December 2014, Peru increased its tax rates when firms are earning substantial profits. These will only apply, however, when firms are making—and declaring—very substantial profits.

Due to the long-term and substantial investments required in extractive industries, investors are particularly cognizant of the stability of tax and other policies. Peru, in particular, has been forthcoming in offering investors tax stability contracts. Many firms have taken advantage of the stability contracts and agreements that can offer 10, 12 and 15-year tax stability. This guarantee comes at a price but many mining firms in Peru have preferred this lower-risk option.

If extractive sectors are over-taxed, foreign direct investment will suffer. Overall, the mining sectors in both Colombia and Peru continue to draw investment from abroad: the share of FDI going to the extractive sector in Colombia is about 20% and is substantially higher than its contribution to GDP. In Peru, mining commanded 24% of total FDI entering the country and contributed to GDP at the level of 14%. Peru ranked 30th out of 122 mining jurisdictions in terms of its attractiveness to investment in extractives, and second in Latin America, and Colombia ranked 58th out of 122.

Equally as important as the collection of revenue is its distribution. Much of the revenue from the extractive industries in Colombia and Peru is invested in infrastructure. Given the high level of demand for infrastructure services, these returns could be substantial. In some other countries, such as Chile, some revenue from the extractive industries is also set aside for development of other sectors. Chile put into place a cluster development policy and some exporting industries such as salmon and trout, wine and fruit, and tourism, in addition to the mining cluster, have benefitted from a sector-specific developmental approach.

Colombia's reform of its system of distribution of royalties undertaken in 2011 was ambitious. Before the reform, 80% of the revenue from royalties was distributed to the regions where minerals and hydrocarbons were extracted; despite this, they represent some of the least developed regions in

Colombia. The new system aims to respond to this sub-optimal situation by distributing revenue from royalties more evenly across regions and improving the effectiveness of investment and infrastructure spending funded by royalties. The reform has not been without challenges. Some regions and municipalities have threatened to close down or refuse entry to mining operations since they no longer directly dispose of a large share of the revenue from royalties.

In Peru, revenue from the mining sector, including corporate tax, royalties and special mining taxes and levies, is distributed among the different levels of government in a somewhat piecemeal fashion. Over 70% of the revenue distributed to the sub-national level goes to just six of Peru's 25 regions. In 2014, nine out of Peru's 25 regional presidents were accused of corruption, most for misappropriation of public funds involved in irregular concessions and public expenditure. The indictments, a severely negative reflection of the system of revenue distribution to sub-national governments, may offer a precious opportunity to reform the system of distribution of royalties in Peru. A move toward a more balanced distribution of revenue, such as that undertaken in Colombia, would be desirable.

A positive step in Peru's management of revenue from the extractive sector is its compliance with the Extractive Industries Transparency Initiative (EITI). Peru is the first country to disclose its earnings at the sub-national level within the context of the EITI. Reporting in accordance with EITI accounting mechanisms increases transparency regarding revenue received by subnational governments and revenue paid by extractive firms. Increased transparency will not resolve the corruption problems in place but may lead to greater accountability in the process.[25]

In both Colombia and Peru, the spending of revenue from royalties is earmarked by region and municipality. In both countries, fractioned spending may not allow financing of larger infrastructure projects. In addition, some projects stretch over many years; this is incompletely accounted for in the context of royalties' revenue budgets and it may prove difficult to fund some projects in particular if the amount of royalties collected diminishes as is forecast, for example, for Colombia.

Technical expertise needed to plan, propose, undertake and oversee large infrastructure projects is often lacking in both Peru and Colombia at the sub-national level. Although the OCAD system in Colombia is intended to assist in this respect through knowledge sharing between national and sub-national levels, the gap in the ability to access and successfully use funds is substantial. In some cases, larger cities and richer regions have been more successful in proposing infrastructure projects which is contrary to one of the aims of the reform. In Peru, the lack of required capacity to carry out substantial infrastructure projects has had the particular consequence that subnational governments, in addition to investing in low-quality and low-impact projects, cannot spend the entirety of their budgets. Ensuring technical assistance in project planning and management will be important for the success of infrastructure projects going forward in both Colombia and Peru, a lesson also for countries that spend their revenues from the extractive sector through a similar process.

Tackling these problems will be a key to taking full advantage of the natural resource endowments in Colombia and Peru. The reform process in Colombia is a first step toward greater accountability and better use of the revenues from its extractives sector. Success in its ambitious reform could allow Colombia substantial investment in infrastructure and could cushion its economy from volatile international commodity prices thereby shielding it from some of the worst effects of "Dutch disease".

Many natural resources exporters experience volatile revenue streams due to unpredictable commodity prices. Colombia has attempted to smooth its central government spending and ease pressure on its exchange rate due to volatility in its main export products from the extractive industries. To combat the rise in the exchange rate due to price changes in natural resource exports and

25. Colombia was admitted as an EITI candidate in October 2014 which represents a positive step toward transparency and accountability.

its potential to dampen the competitiveness of other exports, Colombia has opened a Stabilisation fund, part of which is invested in foreign currency.

Peru would do well to put into place policies that aim to smooth spending of revenues from extractive industries. The extractive industries account for a substantial portion of its government revenue but this share fluctuates with international price movements. The strong volatility in revenue due to international price variation is also transmitted to sub-national governments through distribution of canon and royalty payments. There is insufficient capacity at the sub-national government level to plan and forecast future revenues and therefore to spend the revenue from extractives effectively. A stabilisation fund that smoothed distribution of canon to regions and municipalities, for example, would enable more effective and efficient spending of revenue from extractives.

Managing volatile revenues from resources is a challenge for any government. In Peru and Colombia, as in most countries, this is best done at the level of the central government. This provides another motivation to avoid fragmentation in the distribution of revenue from resources, as the potential for implementing policies to counter volatility is vastly reduced in that case.

In order to impose fiscal discipline and to separate government spending from revenues from the oil and minerals sector, the Colombian government introduced a Fiscal Rule in 2011. Adoption of the Colombian fiscal rule has been a substantial step in the direction of smoothing government expenditure and cushioning the Colombian economy from the volatility introduced by commodity prices. This is not, however, an easy task. One of the important pieces of information necessary to predict the long-term sustainable budget envelope is the long-term average price of oil. This is particularly difficult to predict, and could call into question the forecasts for sustainable spending.

Investing in geological, geochemical and geophysical mapping of resource-rich countries represents an important step in leveraging their comparative advantage in extractive industries. Expenditure to fund research and development of geological resources and geological mapping is positively impacted by the reform in the royalties' distribution system in Colombia.

This is one area where Peru has invested with considerable success. High-quality geological information represents a substantial value added for the minerals sector in Peru, providing information for potential investors and mining sector policymakers. In addition, the Peruvian geological institute, INGEMMET, has provided information regarding potential deposits and mining concessions online at www.ingemmet.gob.pe. Those investments have paid off: almost no investors indicated that the quality of the geological database was a strong deterrent to investment or a reason not to pursue investment in Peru compared with close to 20% of potential investors in Colombia (Fraser Institute, 2013).

Both Peru and Colombia have put into place strategies to tackle the particular problem of criminal mining. Responding to criminal mining in Colombia has been particularly challenging. Some of the criminal elements are linked to groups that have been fighting the Colombian state for decades and whom are presently involved in peace negotiations with the government. The peace dividend could be substantial. An incentive may be present however to under-implement the strategy to combat criminal mining in order to further the peace negotiations or settlement process. Security remains a problem: Colombia was ranked fourth last of 112 mining jurisdictions in terms of the security situation (Fraser Institute, 2013).

A major challenge to the mining sector in both Colombia and Peru remains the high level of informality. There is a clear link in both Peru and Colombia between illegal mining and environmental damage, haphazard exploitation of natural resources and unpaid taxes and royalties. In some other countries, attempts are made to counter these effects with export restrictions. Such policies do not address the heart of the problem however and do not prevent smuggling. A move to greater formalization in the mining sector has positive effects both in terms of revenue generation and containing environmental damage.

Both Peru and Colombia have put into place processes of formalization. In both cases, however, the processes are complicated and onerous. Small-scale and artisanal miners, many of whom are illiterate and based in remote areas, are not necessarily able to comply with all regulations. In addition, in Colombia, the level of regulation required of small firms is the same as for large firms with hundreds or thousands of employees and a potentially much bigger environmental and social footprint. Streamlined procedures and administrative simplification would help to achieve formalization of ASM. Peru does not suffer from this problem as regulation is different for operations of different scale, i.e. large extraction sites are required to comply with more stringent regulations.

One of the processes by which miners may formalize in Colombia is through sub-contracts with mining title holders. This type of sub-contract can simplify the move to formalization and will group ASM miners around title-holders who may be more apt to manage administrative compliance. A move to such sub-contracts thereby represents a positive step toward formalization of ASM. This form of contract, however, shifts the onus of compliance with environmental, security and technical regulations from the title holder to the mining authorities since the title holder is not responsible for compliance with environmental, social and technical requirements.

One aspect of the management of extractives is regulation of concessions. In Peru, concession holders pay few penalties if they do not undertake economic activity. They can hold onto their concession rights for 21 years without proving economic activity on site. This exacerbates the problem of informal sector activity as there are few concessions available. It can also create a situation of rent-seeking by concession holders that have no intention to exploit existing resources.

It is difficult to ascertain trends in the informal sector due to lack of information. In Colombia, the Ministry of Mines and Energy undertook a detailed Mining Census in 2010-11 which provided much-needed information on the situation of informal sector activity. An update would be desirable as new figures would allow a deeper analysis of formalization policies and their potential impact. Access to such information would also be desirable regarding informality in mining in Peru.

Perhaps the most pressing problem as regards informal gold mining is the use of mercury. Given the extensive use of the chemical in some areas, mercury contamination has been described by some officials as a disaster waiting to happen. Signing the Minamata Convention to do away with mercury use in ASM was of prime importance. Coordination among members of the Andean Community will be key to stopping the trade in mercury in the region.

The move to safer, less damaging gold mining processes will require grouping small-scale and artisanal miners around processing facilities and will require access to funding and to more sophisticated technologies. There are some precedents: ENAMI, the Chilean national mining corporation that supports ASM miners is one model; the Federaciòn de Cafeteiros de Colombia is another.

One of the key features of both ENAMI and the Fedecafé is that they buy the raw material from small producers who are often far from international markets. They further process the raw material and add value, thereby financing their operations. Such an organization for ASM would provide an alternative to selling to sometimes corrupt and coercive buyers and would allow small gold miners to access international markets. It could also offer technical solutions to counter the use of mercury that are available only to larger processing operations.

There is a strong potential to respond to some of the problems caused by informal and illegal mining by leveraging demands throughout the supply chain. Certification systems such as Fairmined, Fairtrade and the Responsible Jewellery Council outline sustainable practices for artisanal and small-scale mining. They also respond to demand from some gold buyers, in particular luxury brands, for sustainable, secure, certified supply chains. Assistance to ASM wishing to comply with certification schemes provides one way of responding to the challenges posed by small-scale mining. The Better Gold Initiative (BGI) operated by the Swiss government could be a potential tool in providing incentives to ASM to obtain certifications: Switzerland is by far the largest importer of gold globally.

Peru is the first country in which the Better Gold Initiative has been rolled out. Although the quantities of the metal sold through this initiative are small, there is substantial scope for expansion.

One way to enforce mining, labour and environmental regulations would be to target gold traders and processors. Formal buyers could impose certain conditions on miners. Nevertheless, the potential for success of these initiatives is limited as long as informal and illegal miners can sell their production outside the country. This situation is particularly relevant in Peru and Colombia where the relationship of illegal mining and drug trafficking is close. A regional solution will be needed.

The scale of the environmental and social damage caused by illegal gold mining in the Andean region, as well as elsewhere, coupled with the demand by the retail sector for sustainably mined gold, suggests the necessity for a plurilateral solution. Many initiatives to promote sustainable gold mining, outlined in this report, are very positive. Competing standards and initiatives do not allow full leveraging of the supply chain, however, and frustrate efforts of retail firms to manage their reputational risk. Many countries have, despite their efforts, been unable to halt the illegal mining activities on their territories and to cease the sale of mercury, in part due to smuggling. The extent of the damage is too great to be stopped by private initiatives alone. A plurilateral platform involving governments of gold exporting and importing countries, private sector participants and industry associations, as well as organizations working with ASM on the ground is needed.

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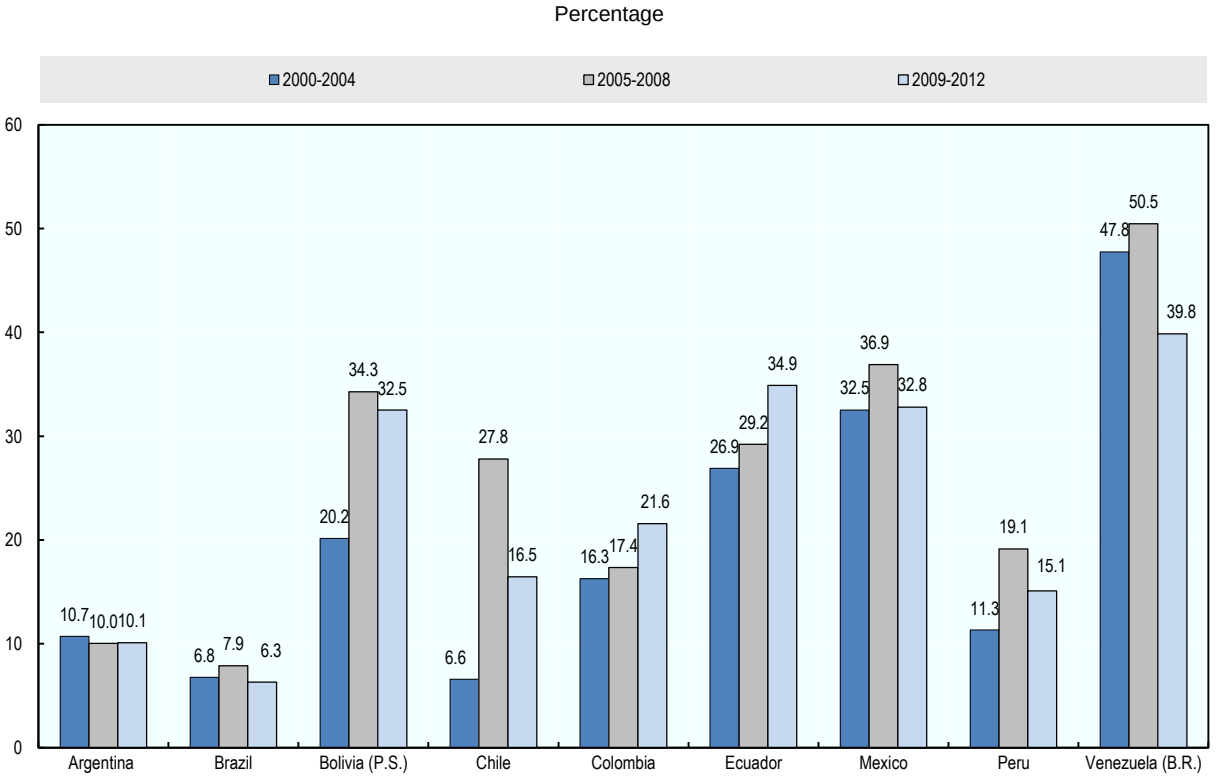
Appendix I.

Comparison of revenues from non-renewable natural resources in Latin America

Appendix Figure 1. Relative participation of revenues from non-renewable natural resources in total revenues



Source: ECLAC, compiled in OECD/IDB/ECLAC (2014).

Appendix II.

Steps toward formalization in the mining sector: Colombia

Basic formalization – LEVEL 1

- Legal requirements (as set out in the Law 685, the Decree 933 and the Decree 480)
    1. Valid proposal for a concession contract
    2. Valid legalization request
    3. Valid formalization request for traditional mining
    4. Valid request for Special Reserve Areas
    5. Request for a Formalization subcontract
    6. Request for relinquishment of the areas to be formalized
- Technical requirements
    1. Baseline for technical aspects of the operation (e.g. Application guides, geological exploration works, initial infrastructure work, description of the exploitation system, exploitation method and ventilation)
- Environmental requirements
    1. Baseline for environmental aspects: application guide; environmental assessment studies (wáter, air, land)
- Social and labour requirements
    1. Comply with the union and the payment of social security
    2. Comply with the labour law and other requirements as well as contribute to the pension plan
- Economic requirements
    1. Pay taxes and economic considerations to the State for the use of natural resources
    2. Required information: calculation of the basic costs of production per unit; basic organizational structure; basic financial statements; plan of association (or community development)

Intermediary formalization- LEVEL 2

- Mining title or operating under a mining title[1].
    1. Comply with all requirements set out in the appropriate formalization instrument
- Technical requirements
    1. Have the approved PTO or PTI
    2. Apply the Environmental guides for mining
    3. Have a mining security standard
    4. Have a certificate for the use of explosives (optional)
    5. Present the "Basic Mining Format" (Formato Básico Minero)
- Environmental requirements
    1. Environmental management documents applicable
    2. Obtain and comply with licences, concessions and authorisations for the use and exploitation of renewable natural resources
    3. Apply Environmental Mining Guides
    4. Viability of the request to subtract the forest reserve area
    5. Comply with all other requirements determined by the environmental authorities

1. Having a valid mining title, a valid operation contract, valid formalization subcontract or assignment of the areas.

- Social and labour requirements
    1. Prior consultation with ethnic communities
    2. Comply with the "Sistema de Gestión de Seguridad y Salud en el Trabajo"
- Economic
    1. Define the minimal production to breakeven and include it as a planning criterion
    2. Organizational structure with hierarchies and a decision-making process
    3. Have a budget and available cash flow
    4. Have a business plan
    5. Pay other charges according to the law
    6. Use the banking sector

Advanced formalization –LEVEL 3

- Mining title or operating under a mining title[2]
    1. Working under a mining title (i.e. hold a valid mining title, have a valid operation contract, valid formalization subcontract, an assignment of rights or subcontract)
    2. Contribute to ensure that other miners work under a mining title
- Technical requirements
    1. Implement efficiently PTO
    2. Implement better technological practices, innovation and development in the industry
    3. Receive training or technical assistance
    4. Implement the mining security standard
- Environmental requirements
    1. Comply with environmental licence, the environmental management document and others as applicable
    2. Obtain training on environmental issues
    3. Put in place clean technologies
    4. Have an environmental seal
- Social and labour requirements
    1. Obtain training on mining social and labour issues
    2. Develop CSR
    3. Have a Social Management Plan
- Economic
    1. Complete financial statements, balance consolidation for direct (? marginal) costing
    2. Comply with tax payment and other payments related to the operation of a mine
    3. Have certifications (process, products or quality)
    4. Consolidate a union (certification) [NTD – this may be to establish a union or obtain certification therefor]
    5. Use the financial sector
    6. Obtain training on financial, banking and mineral market issues
    7. Optimize the production costs
    8. Participate in productive networking activities

2. A valid mining title, a valid operation contract, valid formalization subcontract or assignment of the areas.

Appendix III.

General Mining Procedures and the Responsible Entity: Colombia

Procedure	Responsible entity
Obtain a Mining Title	National Agency of Mining
Mining certificate in the National Mining Registry	National Agency of Mining
Application for the transfer of mining rights	National Agency of Mining
Application for the transfer of a mining area	National Agency of Mining
Calculation, collection and distribution of royalties and other compensations	National Agency of Mining Municipal Mayor's Office
Legal rights for mining purposes	Municipal Mayor's Office
Request of easement of property in favour of mining	Ministry of Mines and Energy
Request of certificate of free mining areas	National Mining Agency
Request of environmental license	National Authority of Environmental Licenses (ANLA), Ministry of Environment and Sustainable Development, Regional Environmental Authorities (CARS)
Request for wastewater discharge permit	Regional Environmental Authorities (CARS)
Request for surface water concession	Regional Environmental Authorities (CARS)
Request for use of timber and non-timber products from natural forests	Regional Environmental Authorities (CARS)
Prior consultation with ethnic minorities	Ministry of Interior, Colombian Institute for Rural Development (INCODER)
Purchase of explosives and demolition accessories	Military Manufacturer (INDUMIL)
Request of importation registry	Ministry of Commerce, Industry and Tourism
Request, update or cancellation of a Unique Tax Registry (RUT)	National Tax and Customs Office (DIAN)
Request to declare capital flows in cash greater than USD 10 000 or its equivalent in other currencies	National Tax and Customs Office (DIAN)
Request to declare the entry or exit of securities representing greater than USD 10 000 or its equivalent in other currencies	National Tax and Customs Office (DIAN)
Request road use permit	National Roads Institute (INVIAS)
Request of a port license	National Infrastructure Agency (ANI)
Registry of workers to the general social security system	General Social Health Security System (SGSSS)
Request of authorisation of proportionality or variation of the proportionality between national and foreign workers	Ministry of Labor
Application for protection by security forces in conflict zones	Presidential Council for Energy and Infrastructure Protection
Authorisation for archaeological exploration and conservation	Colombian Institute of Anthropology and History

Appendix IV.

Formalization process through the use of a subcontract

The Decree 480 defines the steps to obtain an authorisation from the mining authority for the formalization of Subcontracts in Colombia. The request for authorisation must contain the following information: identification of the holder of the mining title and the small-sized miner to subcontract, indication of the area to be subcontracted, the mineral to be exploited, geo-references, and the Subcontract with the contractual object, the name of the parties and description of the area and duration of the subcontract.

The mining authority has 30 open days to evaluate the request and perform a verification visit to assess the viability or not of the Subcontract. Upon the approval of the Subcontract, it must be registered in the National Mining Registry (Registro Minero Nacional) and the subcontractor needs to present the Complementary Work Plan (Plan de Trabajos y Obras Complementario) with the goal to establish the "fiscalización diferencial" and needs to request the appropriate environmental licenses in accordance the 2010 Decree no. 2820.

Detailed summary of Decree 480 regulating the process of formalization

Pursuant to Article 1 the Decree applies to small-scale or artisanal mining, as defined by the Ministry of Mines and Energy, who, on the day of entry into force of Act 1658 (July 15, 2013), are operating in areas authorized by a mining title.

Article 3 lists the documents to be provided to request the authorisation of a formalization subcontract such as general information and identification of the holder of the mining titles; general information and identification of the miner to whom it is subcontracted or his/her legal representatives; identification of the area to be subcontracted; indication of the mineral extracted; map of the area to be subcontracted including geographical references; indication of the age of the exploitation; draft of the formalization subcontract, which must stipulate the identification of the parties, the contractual object, description of the area, duration of the contract (cannot be less than four years).

The mining authority must evaluate the request within 30 open days following the filing of the request (an additional month is granted to correct a request that would be considered not be in conformity with the conditions). (Article 4)

Within 60 open days of filing the request for formalization, the mining authority must undertake a visit to verify and ensure the viability of the area to be subcontracted. Within 30 open days following the visit, the authority must validate or not the subcontract. (Article 5)

Article 6 provides seven (7) reasons to reject of subcontracting, notably when the visit report determines that it is not technically viable to subcontract; when the visit report determines that the work by the artisanal miner are not prior to July 15, 2013; when the mineral to exploit by the artisanal miner is different than the mineral indicated on the title; when the artisanal miner already is a party to a formalization contract.

In accordance with the documents submitted and the viability report regarding the Subcontract for Mining Formalization ("Subcontract" - Subcontrato de Formalizacion Minera), the mining authority provides a ten-day delay to gather all signatures of the parties to the Subcontract. If the Subcontract is not presented within the allocated period, the authorisation will be revoked. (Article 7)

The mining authority will approve the signed Subcontract by administrative act and will order that within 15 days following the approval, the Subcontract be registered with the National Mining Registry ("NMR"). (Article 8)

Once authorized through an administrative act, the actions prescribed in the Mining Code (sections 159 to 161) do not need to be executed.

Once registered with the NMR, the subcontractor is required to present to the mining authority the "Complementary Work Program" (Programa de trabajos y obras complementario).

The subcontractor will have to comply with all the norms concerning mining security and hygiene in the delay established to present the "Complementary Work Program" and in the development of its mining activities.

If the draft of the Subcontract is different to the authorized Subcontract, the mining authority will grant 15 open days to correct the discrepancies, failing of which will cause the revocation of the authorisation. (Article 8 al.2)

The Subcontractor will need to present a technical document containing the Complementary Work Plan for differential *fiscalization* (Plan de Trabajos y Obras Complementario para la Fiscalizacion difererencial) in the format provided for by the mining authority. (Article 9)

The holder of the mining title is required to signify by writing his acceptance of the content presented by the subcontractor. The Complementary Work Plan for the differential *fiscalization* ("Plan") will be annexed to the Work Plan Program (PTO) of the holder of mining title. The subcontractor who wants to modify the Plan will need the approval of the mining authority and the written approval of the holder of mining

In case the Complementary Work Plan is not presented with the approval of the holder of the mining title, the subcontractor will need to suspend its mining activities and the mining authority will terminate the approval of the Subcontract.

The Plan needs to include at least the following information: (Article 10)

- Definitive delimitation of the exploitation area
- Topographic map of the area
- Block plan, measurements and characteristics of the reserves to be exploited
- Description and location of the mining works, mineral deposits
- Monthly and annual production
- Mining Exploitation Plan
- Work Plan of geomorphological, landscape and forestry restoration
- Plan of shutdown of the exploitation and abandonment of infrastructures

Upon the registration with the NMR of the administrative act that approves the Subcontract, the subcontractor needs to request the appropriate environmental licenses to the competent environmental authority. The request for these licenses must be submitted to the mining authority within 2 months following the registration with the NMR (in conformity with Decree 2820 of 2010 of amendments thereof). If the holder of the mining title has the required environmental licenses, they may be assigned. (Article 11)