Global trends affecting the mining industry and the implications for Peru

Public report

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This report is the result of work conducted by CSRM and CCPM to examine global and national mining trends, under the auspices of the mining company Antamina in Peru. The objective of the study was to identify key global and national trends and how these are affecting the mining sector. Ultimately this information is intended to help identify ways to improve the interactions between mining, communities and the environment in the face of the challenges of the coming years.

The authors would like to extend their gratitude to all those who gave willingly of their time and perspectives to help shape the analysis of emerging global and national trends and how these are affecting the mining sector in Peru.

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Cover image

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The Sustainable Minerals Institute (SMI) is a world-leading research[2] institute committed to developing knowledge-based solutions to the sustainability challenges of the global resource industry, and to training the next generation of industry and community leaders. The Institute is transdisciplinary, and our work is independent, impartial and rigorous. Our research integrates the expertise of production, environmental and social science specialists to deliver responsible resource development.

Centre for Social Responsibility in Mining

The Centre for Social Responsibility in Mining focuses on the social, cultural, economic and political challenges that occur when change is brought about by mineral resource extraction. The Centre contributes to industry change through independent research, teaching and by convening and participating in multi-stakeholder dialogue processes. The team consist of anthropologists, sociologists, political scientists, economists, engineers, development and natural resource specialists.

CCPM Grupo Consultor

CCPM is a Peruvian-based consultancy group consisting of researchers and practitioners with extensive experience in the private and public sectors.

CCPM has accompanied companies, governments, multilateral organizations, and civil society, providing guidance, analysis, design, and evaluation in the development and implementation of integrated social strategies to support critical goals and decisions concerning some of the most important investment projects and companies in Peru and other countries in Latin America.

[1] QS World University Rankings and the Performance Ranking of Scientific Papers for World Universities (2019).
[2] The University of Queensland is ranked third in the world for mining and mineral engineering, 2019 Shanghai Rankings by subject.

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Executive Summary

Note on the implications on mining sector globally and in Peru by COVID-19

This report was prepared prior to the outbreak of the global COVID-19 pandemic. The pandemic will have a significant effect on the global and Peruvian economy, and on supply and demand for minerals. The trends discussed in the report are likely to be affected by the pandemic in unforeseen ways.

This report identifies the global trends that are most likely to affect the mining industry over the next decade and considers their implications for Peru. The report begins with an analysis of the institutional context in Peru in 2019, the year in which the study was undertaken. This is followed by a discussion of political, social, environmental, technological and economic trends in that period.

Methodology

The methodology for the paper included a desktop review of the literature on global 'megatrends' and current transformations in the mining industry, followed by 32 in-depth, qualitative interviews with key stakeholders in Peru[3]. The research team combines the expertise of Centre for Social Responsibility in Mining at the Sustainable Minerals Institute of The University of Queensland and CCPM Grupo Consultor headquartered in Lima.

The team adopted an iterative process to select the global trends most relevant to the global mining industry and tested their relevance to Peru in discussion with the interview participants. The selection of five 'global trends' is listed in order of priority to the local stakeholders.

Peruvian context

Peru's economic growth and macroeconomic stability is recognized as one of the best in the region. However, it is affected by significant weaknesses in its political institutions. Weak institutions and governance hamper the State's capacity to address the disruptive effects of relevant factors in the geopolitical and economic context in the coming years. Critical elements of underlying political, economic and social uncertainty for the mining industry are likely to persist.

Global trend 1: Diversifying approaches to governance

Implications for mining

- Global, national, and local changes in the way governments, companies, and civil society interact and share information will generate new opportunities for open, multi-stakeholder initiatives, but also increased expectations of transparency, accountability and participation.
- Global governance initiatives, mineral certification schemes and industry guidelines are gaining traction, as agencies work to fulfil the Sustainable Development Goals by 2030. New models of governance include the rise of voluntary standards as a form of private sector and multi-stakeholder regulation of global value chains.

[3] High- level informants from government (16), industry (6), academia (2), civil society (6), and financial institutions (2) were interviewed in order to provide a broad perspective on the implications of global trends on mining in the Peruvian context.

Implications for mining in Peru

- There is growing interest in Peru for consensus building aimed at facilitating long-term agreements that foster sustainable and inclusive mining and contribute effectively to national development.
- New communication technologies and social media networks are increasing information availability and enabling the involvement of a variety of stakeholders in public affairs, modifying the general conditions under which multi-stakeholder relations are managed in Peru. Live streaming of social unrest and blockages around the Tía Maria project conflict is a notable example.
- The political impact of serious corruption cases involving large companies, political parties and the government has increased Peruvian society's distrust of future development, including mining projects. The trend towards increased anticorruption regulation is expected to continue, but results will depend on the government's willingness and commitment to implement these regulations.
- There is evidence of voluntary application of increasingly stringent sustainability good practices and standards by mining companies operating in Peru.

Global trend 2: Rising inequality and social conflict

Implications for mining

- Focusing on socially responsible operations is becoming the norm for successful new mining projects. Mining companies are increasingly expected to ensure that communities have a strong sense of shared value in the resources sector. Securing social acceptance from local communities has been a challenge for the mining industry in recent years. Many proposed projects have been rejected and operations have been disrupted by protests.
- Global norms for business and human rights are gaining currency within social movements, and local and indigenous communities. Women's rights have achieved greater prominence worldwide over the past decade, with increasing attention on the gender impacts of mining. Social movements are shifting rapidly and can no longer be ignored by the mining industry.

Implications for mining in Peru

- Public participation processes required as part of environmental management in exploration and mining permitting have been improving in terms of inclusion and timeliness. However, they are perceived as formal processes that do not facilitate public participation. Although public participation processes have evolved, bringing the process closer to the people, progress is insufficient, and could exacerbate conflictual situations.
- Among the various interest groups there is great concern around understanding the dynamics of extractive industry development and human rights. There is also distrust on the part of civil society that companies are aware or have a legitimate interest in including a human rights focus in their community engagement practices.
- The Peruvian government has tended to minimise the participation and consultation aspects of environmental assessment processes for mining projects, considering that they introduce delays and negotiation risks that prolong some licensing processes. This has resulted in an increasing number of lawsuits surrounding mining concessions or EIA approvals in areas with indigenous populations. For example, the Constitutional Court of the Superior Court of Justice of Lima's ruling regarding the lawsuit filed by the Awajún and Wampis indigenous peoples for

lack of prior consultation in the Afrodita and Adriana mining projects declared void 111 mining concessions along with the administrative acts that approved their environmental certification.

Global trend 3: Climate change and resource scarcity

Implications for mining

- Due to the combined pressure of population growth and climate change, access to water, land and energy has become increasingly contested. The mining industry is increasingly competing with the agricultural sector for land and water. The cost of these inputs to mining is likely to increase.
- Integrated land and water use planning has become a vital tool for managing competing interests and mitigating conflict over scarce natural resources. Innovations in rehabilitation and water and biodiversity management may help reduce the negative environmental impacts of mining.
- The concept of Climate Smart Mining is an opportunity to reshape public perceptions of mining – from being part of the problem to part of the solution – providing the materials essential to low carbon energy transition. Demand for most minerals is forecast to increase in order to support the sustainable energy transition.
- Since 2019, ICMM has been working with the United Nations Environment Programme (UNEP) and the Principles for Responsible Investment (PRI) to co-convene an inclusive global tailings review for the purpose of establishing an international standard for tailings storage facilities.

Implications for mining in Peru

- Challenges regarding water resources will continue and escalate, as Andean glaciers continue to melt and the coastal basins of the Pacific slopes become increasingly arid. Current mining operations and projects will face greater competition over water resources with agriculture or expanding urban areas.
- The foreseeable trend points to the consolidation of technical and political tools and capacities for structured, rigorous and transparent governance of access and use of water resources. Companies will have to improve their project design processes and invest in improved technologies.
- A series of challenges will have to be overcome to take advantage of demand for minerals associated with low-carbon energy transition. The first challenge concerns the lack of standards for emerging minerals such as lithium. Another concerns the lack of national policy to create the conditions conducive to lithium development in Peru.
- In Peru, there is a trend towards greater supervision of tailings dam operations by the OSINERGMIN, the institution responsible for supervising the safety of large and medium scale mining infrastructure.

Global trend 4: Increasing pace of innovation and uptake of new technology

Implications for mining

- Automated mining operations provide an opportunity to improve occupational health and safety standards of mining.

- Governments and mining companies are faced with developing strategies for transitioning workers who cannot be absorbed by an automated mining sector into new activities through retraining and transitioning programs.

Implications for mining in Peru

- Over the past two decades, approximately half of Peruvian mines have been implementing technological solutions for automation and control in their processes. The pressure to be competitive and continually improve productivity drive digitalisation. Thus far, there is little impact of digitalisation and automation of mining processes in Peru on the size of the labour force. The impact of this trend in the Peruvian mining sector is likely to be moderate in the coming years.

Global trend 5: Realignment of global economic and business activity and the rise of China

Implications for mining

- Changes in the global balance of power from North America and Europe to China and India has led to an increased competition and uncertainty about demand and supply of critical materials.
- Mining companies are likely to face growing geopolitical instability associated with resurgent resource nationalism. Mineral producing countries are becoming increasingly focused on how they can use minerals to leverage national development rather than on supplying them to the global market.

Implications for mining in Peru

- Peru relies heavily on China as an export destination. The increasing geopolitical and trade tensions between China and the US, could contribute to high volatility both for the national mining sector and for the country.
- Cost control is the only variable within mining companies' control. Some companies have realised the importance of social and environmental investment to sustainable mining. Other companies still consider social and environmental investments as non-essential costs. Steady progress in this area is expected.
- Chinese companies have acquired, or shown interest in acquiring, major mining projects and operations in Peru over the past decade. Increasing global political uncertainty and trade tensions between China and the US has increased the value of gold as a safe investment. This has led to the expansion of illegal mining activities, and of its environmental, social, economic and security impacts.
- In Peru, there is a vibrant political discourse around post-extractive visions. In parallel, there are growing demands for fairer distribution of the benefits from extractive activities, giving preference to communities or regions where these activities occur.

1. Introduction and methodology

Note on the implications on mining sector globally and in Peru by COVID-19

This report was prepared prior to the outbreak of the global COVID-19 pandemic. The pandemic will have a significant effect on the global and Peruvian economy, and on supply and demand for minerals. The trends discussed in the report are likely to be affected by the pandemic in unforeseen ways.

'Global trends' are powerful forces that disrupt and change our business, economy, society and personal lives, determining our future world. They pose great risks, but also tremendous opportunities to resolve problems in new ways, to innovate and do things differently. The mining industry is transforming in response to these trends, both at the global level and in Peru.

The aim of this paper is to identify the global trends that are most likely to affect the mining industry significantly over the next decade and to discuss their implications for Peru. We begin with an analysis of the current institutional context in Peru, followed by a discussion of political, social, environmental, technological and economic trends. We consider the implications of each of these five trends for mining in general, and then specifically for the mining industry in Peru.

The methodology for the paper consisted of a desktop review of the literature on global 'mega trends' and current transformations in the mining industry, followed by 32 in-depth, qualitative interviews with key stakeholders in Peru[4]. The research team combines the experience and knowledge of Centre for Social Responsibility in Mining at the Sustainable Minerals Institute of The University of Queensland and CCPM, a Peruvian consultancy firm. We followed an iterative process of selecting the global trends most relevant to the global mining industry, then tested their relevance to Peru in discussion with the interview participants. The final selection of five 'global trends' is listed in order of priority to the local stakeholders.

2. Context: potential implications of institutional weakness of the state in Peru

In Peru, a certain inertia can be observed in the persistence and even deepening of major political and administrative weaknesses. These institutional weaknesses mean that in the coming years, the State may be unable to adequately address the disruptive effects of relevant factors in the international geopolitical and economic context. Critical elements of political, economic and social uncertainty for the mining industry will continue.

2.1 Persistence of structural weaknesses and instability of the Peruvian political system

Peru's economic growth and macroeconomic stability is recognised as being one of the best in the region. However, it is also recognised that it is affected by serious weaknesses in its political institutions.

[4] High- level informants from government (15), industry (6), academia (2), civil society (6), and financial institutions (2) were interviewed in order to have a wider perspective on the implications of global trends on mining in the Peruvian context.

Political confrontation between the Executive and Legislative powers from 2016 to 2019, coupled with the political impacts of the Odebrecht corruption investigations, has heightened civil society's distrust in political institutions and major public or private investment projects. It has also engendered a series of serious political events that have hampered normal functioning of the state.

In the past four years, this political climate of confrontation has caused, among other things, a President to resign[5], continuous changing and charging of ministers in important sectors (contributing to serious delays in critical programs such as reconstruction in regions affected by El Nino in 2017)[6], accusations and warrants for the arrest of important political leaders and national and regional authorities; culminating in the political situation when the study was conducted, in which the President has dissolved Congress and called Parliamentary elections for 26 January 2020[7].

These conditions highlight a cyclical phenomenon in Peruvian politics and reflect long-term structural weaknesses. These include the lack of a stable multi-party system, internally fraught and unrepresentative political and social organisations, and a political culture that tolerates informality and authoritarian leadership. These and other factors weaken society's trust in formal institutions to represent them, uphold public agendas and address conflict[8].

Distrust is mounting at the political level closest to the people. Their direct experience is of inefficient service provision, direct evidence of high levels of corruption, insecurity and lack of incentive for participation and citizen controls[9].

There is no evidence to suggest that these factors will improve perceptibly in the medium term. There is no sign of political and electoral reform or of aligned policy proposals and political organisation that could contribute to notable change. The conditions that may foster social and political instability in coming years will persist, affecting the local and regional environment in which mining companies operate.

2.2 Persistence of weaknesses in decentralisation and processes to modernise state administration and management

As well as the political factors, corruption, and loss of institutional legitimacy, the Peruvian government has not been able to overcome barriers to administrative and management modernisation. This has severely limited its capacity to provide quality public services and to make public development investments.

These limitations affect key cross-sector policy and program strategic planning, coordination and implementation processes. They also affect local and regional governments' capacity to coordinate and execute inter-governmental investment and public service programs.

Despite multiple public, private and multilateral projects and initiatives to improve subnational government capacities, the foreseeable trend in the medium-term points to continuing difficulties

[5] Pedro Pablo Kuczynski's resignation to the Presidency of the Republic of Peru was presented on March 21, 2018.
[6] In the last five years, Peru registers 106 ministerial changes with an average of 9 months and two weeks of validity of ministerial positions.
[7] https://elpais.com/elpais/2019/10/03/opinion/1570116425_800517.html
[8] OECD (2016), Estudios de la OCDE sobre Gobernanza Pública: Perú: Gobernanza integrada para un crecimiento inclusivo, Estudios de la OCDE sobre Gobernanza Pública, OECD Publishing, Paris, https://doi.org/10.1787/9789264265226-es.
[9] LAPOP, IEP (2018), Cultura Política de la Democracia en Perú y en las Américas, 2016/17: Un estudio comparado sobre democracia y gobernabilidad. Barometro de las Américas. Latin American Public Opinion Project, Vanderbilt University. Instituto de Estudios Peruanos. Lima, https://www.vanderbilt.edu/lapop/peru/AB2016-17_Peru_Country_Report_Final_W_031918.pdf

with human resources, administrative and accounting systems. This will affect the capacity to design and execute investment projects at local and regional government levels[10].

This will directly affect the local operating context for mining companies, as significant gaps in economic and social infrastructure and service provision will remain, despite important contributions derived from mining[11].

The imbalance between mining profitability and taxation and low levels of local public investment, will continue to feed social and political perceptions and discourses in mining regions and towns. This will mean demands for increased direct contributions from mining, even though the crux of the problem lies in the capacity to plan and spend available resources, rather than a lack thereof.

The Peruvian government tends to consider that institutional support for the mining sector consists primarily of administrative measures, such as simplifying administrative processes and providing tax breaks. However, the real difficulty lies in the lack of effective management to generate conditions conducive to development and regional social, environmental, political and economic competitiveness, and generate trust in and highlight the benefits from mining.

However, even the best governmental initiatives, such as the recent National Competitiveness and Productivity Policy and Plan, require institutional reforms and intensive processes of cross-sector coordination with subnational governments. These processes are currently hampered by the political crises and the persistent trend seen within Government of sector-based implementation without specific regional criteria.

The central government may have the technical capacity to develop sectoral development visions and promotion or competition frameworks, but this does not ensure adequate appropriation of these frameworks by other sectors or levels of regional and local government that have not been involved in their design.

Without the institutional conditions and capacities to coordinate effective regional development processes, there will continue to be conditions of social and political risk in mining operations' areas of influence. Measures such as 'Works for Taxes'[12] are part of the financing and coordination strategies that seek to avoid some of these political and management pitfalls and can have specific impacts in certain regional and local contexts. But only an increasingly sound institutional foundation will ensure the sustainability of mining investments during their operational lifetime and the sustainability of regions beyond that.

2.3 Resilience of the Peruvian economy despite political and institutional instability

Nonetheless, it is important to highlight that despite shortcomings in governmental management capacity, and the high levels of political polarisation and instability in recent years, indicators of stability and resilience can be seen in the ways in which society and the country's economy maintain a relatively positive and steady performance.

Reports from the National Statistics and Information Institute (INEI) presenting the evolution of the Peruvian economy to August 2019, show positive growth rates in important areas of the primary

[10] "Efectividad de la inversión pública a nivel regional y local". Estudio técnico. Contraloría General de la República. Gobierno del Perú. Lima, 2016.
[11] "Brechas latentes. Índice de avance contra la desigualdad – Perú". Oxfam América Inc. Lima, 2017. https://peru.oxfam.org/sites/peru.oxfam.org/files/file_attachments/Brechas%20latentes%20-%20Indice%20desigualdad.pdf
[12] *Work for taxes* is a form of paying income tax whereby companies can choose (Law 29230), rather than pay in cash, to pay taxes by carrying out a public works project in a given location.

sector (fisheries, agriculture, livestock and mining) and in trade, recovery of public and private construction, growth in energy consumption, among others, suggesting an economic growth rate in August that is higher than the expected annual rate.[13] The reports from INEI for September also suggest that the negative impacts on the economy come from outside, due to a drop in the value of exports and international prices[14].

JP Morgan Chase's Emerging Market Bond Index (EMBI) monitor for August 2019 indicated that, despite a slight increase in the past quarter, Peru would maintain the lowest risk indicator of Latin America[15]. This can be explained mainly by rigorous and disciplined management of fiscal deficit levels, which suggests that the country will continue maintaining overall macroeconomic discipline and there is a low probability of drastic change in economic trends beyond political volatility.

Despite the high level of conflict, the content of political discourse and behaviour of key national players show no signs of drastic change in the general economic trends of the country in the medium term. As mentioned in the box at the beginning of the report, there was no way of predicting the current context of Covid-19.

3. Global trends and their implications

3.1 Political

Global trend 1: Diversifying approaches to governance

"While governments are likely to remain the primary mechanism for coordinating human activity, more diverse governance approaches are emerging. Some are extensions of state authority, while others involve non-state and local actors in 'network governance', based on informal institutions and instruments"[16].

Implications for mining:

1.1 Transformations in the institutional context and roles of stakeholders in mining-related social and environmental governance

Global, national, and local changes in the way governments, companies, and civil society interact and share information will generate new opportunities for open, multi-stakeholder initiatives, but also increased expectations of transparency, accountability and participation. This will increase transaction costs and requirements when developing new mining projects in the country as regards social and environmental standards and management practices. Greater access to information and social media is a key driver of network governance.

Due to the continued strengthening of civil society, there are higher demands for fairness and democratisation of decision-making. Transparency and disclosure of information are becoming key prerequisites for a successful mining operation.

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[13] INEI (2019), *Comportamiento de la Economía Peruana en el Segundo Trimestre de 2019. Informe Técnico (agosto 2019)* Instituto Nacional de Estadística e Informática. Lima, https://www.inei.gob.pe/media/MenuRecursivo/boletines/pbi_trimestral.pdf

[14] INEI (2019), *Indicadores Economicos. Boletín Estadístico No.18 (setiembre 2019)* Instituto Nacional de Estadística e Informática. Lima, https://www.inei.gob.pe/media/MenuRecursivo/boletines/pbi_trimestral.pdf

[15] "Indicadores de riesgo para países emergentes: EMBIG. Diferencial de rendimientos de bonos del Tesoro de los Estados Unidos". Banco Central de Reserva del Perú, Gerencia Central de Estudios Económicos. Setiembre 2019. https://estadisticas.bcrp.gob.pe/estadisticas/series/cuadros/notasemanalmensual/cn-035

[16] European Environment Agency. The European Environment State and Outlook 2015: Assessment of Global Megatrends, p. 103.

Implications in Peru:

a) Growing interest in consensus building of long-term agreements and mining law reforms

There is growing interest in the country for consensus building to facilitate long-term agreements that help mining to develop sustainably and inclusively and contribute effectively to development. Similarly, a need has been identified to update the Mining Law[17] of 27 years, to increase the mining sector's long-term competitiveness and sustainability. The Ministry of Energy and Mines (MINEM) and the Ministry of the Economy and Finance (MEF) respectively are leading these initiatives.

The first of these initiatives led to the definition of the "Peru Mining Vision to 2030" through the Centre of Convergence and Good Practice in Mining and Energy (Rimay[18]), which was established in August 2018. This initiative is supported by the Inter-American Development Bank (IADB). It is aimed at facilitating a platform for high-level dialogue and technical discussion. It brings together government, the private sector, civil society and academia to build consensus regarding the future vision for the mining and energy sectors in Peru.

In January 2019, Rimay's High Level Group[19], completed its first work phase with the publication of the proposed national mining vision: "*By 2030, mining in Peru is inclusive, socially, environmentally and regionally integrated within a framework of good governance and sustainable development. It has been consolidated as a competitive and innovative activity and is valued by society as a whole."*[20] This proposal includes seven priority activities:

- Strengthening of regional and local governance capacities
- Improved practices in water resource management
- Support of R&D+I[21] throughout the mining value chain
- Modern and innovative legal framework, maintaining high environmental and social standards
- Eradication of illegal mining
- Promotion of clusters, links and diversification of production and
- Pilot plan for a regional focus for productive development.

The document that guides the mining vision to 2030 has been well received by the various stakeholders involved in mining, except for some civil society organisations that consider it contributes to maintaining economic dependency on mining. However, there is still uncertainty around the second stage of this initiative, the regional roll-out of the vision through decentralised sessions.

The next steps planned by MINEM, with IDB funds, is to roll the process out in two or three mining regions, building multi-stakeholder dialogue spaces adapted to the reality and needs of each region. The aim is to generate consensus among stakeholders around the long-term vision of mining in each region. Similarly, technical working groups will be established for each of the seven activities prioritised in the 2030 mining vision document. They will be made up of technical experts

[17] This law was approved by Supreme Decree 014-92-EM on 3 June 1992.
[18] *Rimay* is a Quechua Word that means "dialogue" and "convergence".
[19] The High Level Group had 33 members from civil society, the private sector and public entities and developed this document during ten working sessions from September 2018 to January 2019.
[20] Centro de Convergencia y Buenas Prácticas Minero-Energéticas - RIMAY, Lima, enero 2019.
[21] Research, Development and Innovation.

from different sectors and will develop specific action plans to implement the priority actions[22]. To date, there is no timeline for defining these steps[23]. In October 2019, the MINEM formalised the creation of Rimay, strengthening the institutional framework for these processes[24].

Reformulation of the General Mining Law (LGM in Spanish) was announced by President Martin Vizcarra in his national address on 28 June 2019. The initiative has been interpreted by many of those interviewed and by analysts as a response to regional government calls for solutions to the social conflicts in their regions. Among these, Tia Maria in Arequipa stands out in particular. While it is widely recognised in the sector that the normative framework requires some adjustment, it is not considered an opportune time to carry out such complex reform given the current context of political crisis, which involves early congressional elections.

To date, there are two proposals concerning reform of this law. The first is being developed by the Executive, through the MEF, that is seeking to strengthen the competitiveness and sustainability of the mining sector. This proposal does not include major changes in taxes or grant environmental oversight facilities to regional governments. The three main aspects of the new law will be: (i) regional development plans to close social gaps and build company commitments for regional development as a means of gaining social licence; (ii) adjustments to mining concessions; (iii) widening the mining canon[25] to regional governments and municipalities to stimulate public investment from the beginning of operations.

In parallel, a proposal presented in August 2019 by the regional governors of Arequipa, Apurimac, Cusco, Madre de Dios, Moquegua, Puno and Tacna[26], contains eight themes, among which can be highlighted: (i) the creation of a state mining company (*Peru Mining Company*); (ii) the reduction of concession validity from 30 to 15 years; (iii) implementation of participatory mechanisms for Campesina and Indigenous communities in mining activities, whether as shareholders or direct participants; (iv) the transfer of responsibilities for prevention, evaluation, supervision, control and sanction of mining companies to regional governments. This proposal has been qualified as "statist" by the National Mining and Petroleum Company (SNMPE) and as a threat to competition in the Peruvian mining sector and to the environmental monitoring institutional structure. Similarly, it is perceived that the expectations of regional governors with regard to the changes that could be made to the LGM are around themes that are regulated by other legal instruments such as the Royalty Law, the Canon Law, the Law on Profit Taxes, Law on Prior Consultation etc. so in practice it would not be possible to implement these provisions.

LGM reform is proposed in a context that is not conducive to obtaining political approval. However, it is considered that it could offer a window of opportunity to initiate discussion on issues critical to the development of mining activity, which align with the provisions of the 2030 Mining Vision. However, the institutional limitations of the State and the lack of the legitimate political representatives required to achieve long-term strategic agreement on mining are the key obstacles to these initiatives.

[22] MINEM (2019). Reunión MINEM – Sector Minero. Presentación del Ministro de Energía y Minas. Julio, 2019.
[23] http://www.rumbominero.com/ED120/RumboMinero_ED120.pdf
[24] R.M. Nº 302-2019-MINEM/DM; published on 7/10/2019.
[25] This mechanism was used during 2012-2013. The MEF is looking to improve it.
[26] There is even a third proposal, from the political group Nuevo Peru, which aims to cancel mining concessions and grant five year permits in their place, to eliminate property rights. Similarly, it proposes including an extra profit tax when prices are high and making regional and local governments responsible for evaluating Environmental Impact Assessments.

b) Higher levels of civil society access to information, awareness and participation

New information and communication technologies and social media networks are increasing information availability and enabling the involvement of a variety of stakeholders in public affairs, modifying the general conditions in which multi-stakeholder relations are managed in Peru. For example, live streaming of social unrest and blockages around the Tía Maria project conflict.

In Peru, the gradual extension of mobile phone and internet technologies into rural areas provides the population with greater access to sources of information on mining related issues. In 2018, according to the National Institute of Statistics and Informatics (INEI), 71.2% of the population in rural areas had internet access via cell phone, representing an increase of 5.9% on the previous year[27].

In the coming years, increased access to information should foster stronger processes of transparency, accountability and participation. However, it is possible that if there is a continued lack of focus and content in communication, inaccurate perceptions and misinformation could be propagated, affecting the image of the sector and public trust in it.

1.2 Spotlight on corruption and business integrity to build trust in the mining sector

Business integrity in interaction with government officials is a growing concern for the compliance functions of mining companies. The EY Global Fraud Survey 2018 found that senior executives see corruption among the greatest risks to business[28]. Multi-stakeholder initiatives are increasingly seeing the need to integrate political economy into this work to understand the politics behind major governance issues. Systemic corruption and state capture is a greater risk to political stability than efforts to root out corruption at the transactional level between one party within a company and one middle-level official.

The Extractive Industries Transparency Initiative (EITI) has been pushing the frontier of data we now expect to be disclosed, for example, emerging issues related to disclosure of subsidiary structures and value chain transparency. The EITI Standard 2019 has new requirements on reporting gender disaggregated data and environmental impacts, transparency around commodities trading and a breakthrough on contract transparency. There has been an evolution from the early days of a narrow focus on transparency, to recognition and realization of the problem of 'zombie-transparency' (disclosure of data without clear purpose) and the need for complementary accountability and participation (TAP).

Implications in Peru:

a) Strengthening of anti-corruption strategies and standards

The political impact of serious corruption cases involving large companies, political parties and the government (at various levels) in Peru has increased society's distrust of future development of major investment projects, including mining projects.

Between 2002 and 2018, the Attorney General's Office specialising in crimes of corruption (PPEDC in Spanish), identified 4,225 cases of corruption in regional and municipal governments. During this period, 57 regional governors[29] and more than 2,000 mayors and former mayors would

[27] "Estadísticas de las tecnologías de información y comunicación en los hogares". Informe técnico Nº 2, junio 2018. Instituto Nacional de Estadística e Informática. https://www.inei.gob.pe/media/MenuRecursivo/boletines/01-informe-tecnico-n02_tecnologias-de-informacion-ene-feb-mar2018.pdf

[28] EY (2018), Integrity in the spotlight: The future of compliance: 15th Global Fraud Survey.

[29] More than half the regional governors elected in this period are being prosecuted for corruption.

have been implicated in corrupt practices during their mandate[30]. At central government level, all former presidents, from the 1990s onwards, are under legal investigation, showing just how far corruption has penetrated the government itself, hence the term “crisis of the political parties”[31].

Corruption is also an obstacle to social and economic development and is affecting the country’s entry into the OECD. The perception of corruption is high in Peru compared to OECD countries, and is seen as the third largest obstacle to doing business in the country[32].

In turn, generalised corruption feeds public distrust of the State and the perception that in Peru, regulations have been established to give precedence to mining interests over public interests[33]. For companies, corruption is a dissuasive factor when it comes to participating in initiatives such as the ‘Works for Taxes’ initiative. They are discouraged by a lack of trust in regional and local governments and the additional efforts needed to ensure suppliers comply with anti-corruption standards. For mining investors, this issue increases the perception of risk in the country, affecting the execution of projects and free competition.

Initiatives like EITI, which Peru joined in 2005, contribute to building a climate of trust by publishing extractive company contributions to the state. In the future, it is hoped that EITI will also be able to offer information on how the income from mining is distributed and used, hence the implementation of the initiative in five regions[34].

New national standards are also seeking to strengthen the fight against corruption. However, there are no tangible results. The National Integrity and Fight against Corruption Plan 2018-2021 recommends that companies implement good corporate preventive practices in line with Law 30424[35] and its corresponding regulations issued in 2019. They also recommend using broader standards such as ISO 37001.

Despite these regulations, companies note that these anti-corruption controls do not filter down to regional and local levels, and thus are not having the desired effect. While the perception is that the trend will continue towards greater anticorruption regulation, the results will depend on the extent to which these regulations are adopted by the entire national government system. This will require the country to overcome the institutional and governance difficulties it faces.

1.3 Increasing importance of voluntary sustainability standards and level of expected compliance with environmental, social and governance (ESG) performance criteria and certification schemes.

Global governance initiatives, mineral certification schemes and industry guidelines are gaining traction, as agencies work to fulfil the Sustainable Development Goals by 2030. New models of governance include the rise of voluntary standards as a form of private sector and multi-stakeholder regulation of global value chains. These ‘soft laws’ can fill gaps in regulation in certain

[30] Procuraduría Pública Especializada en Delitos de Corrupción – Ministerio de Justicia y Derechos Humanos (PPEDC). La corrupción en los gobiernos regionales y locales. Informe Temático. Unidad de Análisis de Información. Setiembre 2018. https://procuraduriaanticorrupcion.minjus.gob.pe/wp-content/uploads/2018/09/LA-CORRUPCIÓN-EN-GOBIERNOS-REGIONALES-Y-LOCALES.pdf

[31] https://ojo-publico.com/1228/dato-de-del-solar-sobre-que-existen-57-gobernadores-regionales-y-mas-de-2-mil-alcaldes-vinculados-a-hechos-de-corrupcion-es-cierta

[32] OCDE (2017). Estudio de la OCDE sobre integridad en el Perú: Reforzar la integridad del sector público para un crecimiento incluyente, Estudios de la OCDE sobre Gobernanza Pública, Editions OCDE. Paris. https://dx.doi.org/10.1787/9789264271470-es

[33] PROÉTICA Consejo Nacional para la Ética Pública (2019). Riesgos de corrupción en el sector minero: Informe Perú. https://www.proetica.org.pe/wp-content/uploads/2019/02/estudio-mineria-proetica.pdf

[34] https://eiti.org/es/implementing_country/6

[35] Law that regulates the administrative responsibilities of individuals for International bribery.

jurisdictions and enable firms to signal good practice to their downstream customers and differentiate from their competitors.[36]

Implications in Peru:

a) Increasing interest by companies in following sustainability standards and good environmental and social practices

Voluntary application of increasingly strict sustainability good practices and standards can be seen in mining companies operating in Peru, predominantly among the majors that are ICMM members. Uptake by other companies can be foreseen. Furthermore, Peruvian companies, such as the SNMPE and the Institute of Mining Engineers have recently joined ICMM, signing up to its standards and improved responsible management objectives[37].

As a member of the UN, Peru is signatory to the agreements and work agendas under the 2030 Sustainable Development Goals[38], many of which promote private sector participation and collaboration to achieve social, economic and environmental sustainability objectives[39].

Although not yet a regulation, it is probable that in coming years many international and national companies operating in Peru will subscribe to specific standards and good practices around preventing and fighting corruption. For example, ISO 37001 on anti-bribery measures is already being applied in some extractive projects in Peru.[40]

Although levels of best practice implementation still vary greatly, national and international mining company employees operating in Peru recognise that, to face the global challenges posed by social inequality and environmental crisis, mining must become more sustainable. If it does not, the Peruvian mining sector will not be competitive on the national or international stage in the medium and long term. It is expected that although some companies in the sector may resist or find it difficult to adapt, companies and peak bodies will gradually integrate best practice into their systems and promote their increasing and wider use in more mining projects.

3.2 Social

Global trend 2: Rising inequality and social conflict

"The pressures on social contracts have been building for some time now. Economic inequality has steadily become more extreme across most of the world… the next waves of disruption promise to drive these conflicts to a breaking point."[41]

[36] European Environment Agency. The European Environment State and Outlook 2015: Assessment of Global Megatrends, p. 105.
[37] "Responsible mining in Perú: partnerships for development". International Council on Mining and Metals. London, 2013.
[38] "La minería como motor de desarrollo económico para el cumplimiento de los Objetivos de Desarrollo Sostenible 8, 9, 12 y 17". Consorcio de Investigación Económica y Social-CIES. Lima, 2018. https://www.cies.org.pe/sites/default/files/investigaciones/agenda_2030_la_mineria_como_motor_de_desarrollo_economico_para_el_cumplimiento_de_los_ods_89_12_y_17.pdf
[39] "ATLAS: Mapeo de la Minería para los Objetivos del Desarrollo Sustentable". Columbia Center for Sustainable Investment (CCSI), Sustainable Development Solution (SDSN) Network, United Nation Development Program (UNPD), World Economic Forum (WEF). 2016.
[40] International Organization for Standardization (2016). ISO 37001:2016 Anti-bribery Management Systems – Requirements and guidance. https://www.iso.org/obp/ui/#iso:std:iso:37001:ed-1:v1:en
[41] EY What's after what's next? The upside of disruption: Megatrends shaping 2018 and beyond, p. 72.

Implications for mining:

2.1 Growing social awareness and focus on responsible mining

This year, the term 'license to operate' was ranked first in the top ten business risks facing mining and metals.[42] Focusing on socially responsible operations is becoming a norm for successful new mining projects. Mining companies are increasingly expected to ensure that communities have a strong sense of shared value in the resources sector. Securing social acceptance from local communities has been a challenge for the mining industry in recent years.[43] Many proposed projects have been rejected and operations have been disrupted by protests.[44] While numerous mines are nearing the end of their productive life, insufficient funds are often set aside for social impacts of closure.[45]

Global norms for business and human rights are gaining currency within social movements, local and indigenous communities. The rights of women and girls have assumed greater prominence worldwide in the past five years, increasing attention on the gender impacts of mining. Social movements are shifting rapidly and are generating increasing pressure on the mining industry. Ten years ago the conversation was around resource governance. Five years ago, it was about environmental and social impacts. In the last two years, climate action has been added to this agenda (see trend 3: environment). There have been major political protests and large-scale citizen action globally on climate change (for example, the new social movement called "Extinction Rebellion").

New mining projects are increasing the sector's footprint without necessarily providing additional employment opportunities at the local level.[46] In this context, responsible global mining companies are becoming increasingly proactive in addressing and responding to stakeholder concerns and demands at the very outset of mining operations.

Implications in Peru:

a) Persistence of weak public participation and prior consultation processes in the mining sector

The public participation processes required as part of the environmental management instruments used for exploration and mining permitting have been improving in terms of inclusion and timeliness. However, they are perceived as formal processes that do not facilitate effective public participation. Public participation processes have evolved, bringing the process closer to the people and generating tools to integrate an intercultural and gender-oriented focus. However, progress is still considered to be insufficient, which could exacerbate conflictual situations.

Although participation processes seek to create opportunities to provide communities with timely and appropriate information on project activities, in practice, these processes generate vertical, difficult-to-navigate spaces, which are usually only taken advantage of by a few stakeholders. In practice, these spaces do not achieve the objective of enabling the public to influence government

[42] EY Top 10 business risks facing mining and metals in 2019-20, p. 3.
[43] Rodriguez, M., Carr-Cornish, S., Boughen, N., Lacey, J. and Moffat, K., 2018. Understanding the social acceptance of mining. In *Mining and Sustainable Development* (pp. 27-43). Routledge.
[44] Franks, D.M., Davis, R., Bebbington, A.J., Ali, S.H., Kemp, D. and Scurrah, M., 2014. Conflict translates environmental and social risk into business costs. *Proceedings of the National Academy of Sciences*, 111(21), pp.7576-7581.
[45] Owen, J. and D. Kemp (2018) Mine closure and social performance: an industry discussion paper. Centre for Social Responsibility in Mining, Sustainable Minerals Institute, The University of Queensland: Brisbane.
[46] Keenan, J., Kemp, D. and Owen, J., 2019. Corporate responsibility and the social risk of new mining technologies. *Corporate Social Responsibility and Environmental Management*.

decisions on environmental standards[47]. The opportunity to learn about and understand project complexities and impacts is limited. Any acceptance that projects achieve in this context is usually driven by the economic context, opening the way for future concerns. This issue is particularly relevant in the conflictual context in Peru, where the last three major conflicts (Conga, Tia Maria and Las Bambas) raised serious questions around the Environmental Impact Assessments and the participation processes.

Indigenous and First Nations people's right to prior consultation (Law 29785 of 2011) provides for the right of Indigenous and First Nations peoples to be consulted on the legislative or administrative measures that directly affect their collective rights, cultural identity, physical existence, quality of life or development. National and regional plans, programs and projects that directly affect these rights must also undergo consultation processes. This law must be implemented by the State. This right is covered in ILO Convention 169, to which Peru became a signatory in 1995, and is part of Peruvian legislation. In line with national regulations engendered by the right to prior consultation, the state entity responsible for the measure (legislative or administrative) that may affect the indigenous population, must implement the consultation process for that population. The Ministry of Culture coordinates public policy relating to the implementation of this right.[48]

However, implementation of prior consultation in mining has been complex and controversial and has been the subject of much criticism and concern from various sectors: private enterprise, unions, NGOs and Indigenous federations. Following several years of implementation, opportunities to improve the process in the mining context have been identified around specifying when consultation should take place to ensure full participation of Indigenous or First Nations peoples. There is also a need to consider whether previous infringement of Indigenous or First Nations people's rights should be addressed in the consultation processes as this distorts focus about the project under review. It points rather to an existing situation of neglect by Government.

b) Human Rights: an issue that is controversial and of increasing interest

Among the various interest groups there is greater concern around understanding the dynamics of extractive industry development and human rights[49]. This is an issue of concern where companies, government and civil society organisations have held different positions that do not always converge.

Companies have an increasing interest in better understanding their responsibility around the human rights of the communities that could be affected by their activities or by those of their contractors. It has been a gradual process that began with the Global Reporting Initiative (GRI) reports and continued within the framework of the Global Compact.

In 2010 there was an investigation to understand the degree of implementation of the Voluntary Principles on Security and Human Rights[50] by relevant companies, governments and civil society organisations. This resulted in the setting up of the Voluntary Principles on Security and Human Rights Working Group at the end of that same year. There are now around 40 institutions involved, including representatives of government, companies and civil society. From 2018 this Working Group is including the Guiding Principles on Business and Human Rights in its agenda.

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[47] Valencia, A. 2018. Participación ciudadana en la evaluación ambiental del sector minero en el Perú: Análisis de las dinámicas participativas e incorporación del enfoque de género. Cuaderno de Investigación N° 8

[48] Sanborn, C., Hurtado, V. & Ramírez, T. (2016). La consulta previa en el Perú: avances y retos. Lima: UP. Setiembre 2016.

[49] Company activities must follow the Guiding Principles on Business and Human Rights, putting into practice the UN framework "protect, respect and remedy" and the Voluntary Principles on Security and Human Rights.

[50] Study conducted by NGO Socios Perú.

In parallel, company associations such as the National Confederation of Private Company Institutions (CONFIEP) and the SNMPE, already have human rights committees that are developing guidelines, and companies have begun integrating human rights into their social management systems. Interviewees indicated that there is greater openness to implementation on the part of Peruvian subsidiaries of major corporations, due to their international commitments.

Government's interest in including the issue of human rights and business can be seen in the recent National Human Rights Plan 2018-2021[51], which incorporates for the first time a section "directed towards the implementation of international standards on the relationship between business and human rights"[52]. The implementation of this plan will align with implementation of the Guiding Principles.

This issue is of central importance to the Peruvian Government, as it aspires to join the OECD, which also has guidelines[53] for multinational companies that are aligned with the Guiding Principles. There is a long road ahead, as indicated by the UN Working Group on human rights and transnational companies in its 2018 report on Peru[54]. This report highlights the need for improvement in issues around Indigenous Peoples (participation, land rights and conflict), security (contracting public armed forces for private projects), protection of human rights defenders and, with regard to companies, the need to implement human rights due diligence processes.

There is civil society distrust that companies are aware or have a legitimate interest in including a human rights focus in their community engagement practices. Hence the focus on controls. In 2018, the Civil Society Platform on Companies and Human Rights[55] was created (as part of the National Human Rights Coordinators Office) to highlight human rights transgressions by extractive companies (not only mining). They also monitor the government in its implementation of the guiding principles. To this end, these organisations made observations on the methodological process and on the participation of civil society organisations regarding the third National Human Rights Plan.[56]

c) Emergence and consolidation of new behaviour patterns in socio-environmental conflict processes linked to extractive projects

Social conflict phenomena have also increased in reach and visibility alongside industrial mining development and expansion in Peru over the past 20 years. A large proportion of these conflicts focus on the concerns or distrust of different social groups regarding potential or actual impacts of mining on the environment, their land and their livelihoods. There are also cases in which expectations and demands of specific sectors seeking to benefit from mining has generated conflict.

While mining-related conflicts are not necessarily increasing, they can be seen to be growing in intensity and can occur simultaneously. Likewise, some of the behaviour patterns on the part of

[51] This is the third plan in which several ministries and representatives of civil society participate. The previous plans were in force between 2006 and 2011 and from 2014 to 2016.
[52] http://spij.minjus.gob.pe/content/banner_secundario/img/muestra/PLAN-ANUAL.pdf
[53] http://www.oecd.org/investment/mne/16975360.pdf
[54] https://documents-dds-ny.un.org/doc/UNDOC/GEN/G18/129/19/PDF/G1812919.pdf?OpenElement
[55] The participants in this platform are: DAR, Amnistía Internacional, Oxfam, Red Muqui, Aprodeh, Perú Equidad, Fedepaz, RedGe, Diakonia, Codehica y Derechos Humanos sin Frontera (DHSF)
[56] http://cooperaccion.org.pe/wp-content/uploads/2019/06/Observaciones-al-documento-de-la-metolog%C3%ADa-del-proceso-presentado-por-el-MINJUS-PSEDH-10042019-1.pdf

social stakeholders, companies and the government itself are becoming entrenched, which exacerbates conflictual situations.

It is suggested that in the face of public distrust of formal participation channels and of public representation of local interests, there is a trend towards increased use of illegal mobilisation and pressure strategies (blocking of roads, capture of installations or vehicles, involuntary retention of people, actions against third parties and property). The aim of this is to draw public attention and gain access to the negotiation table to process their demands.

Another aspect of this emerging trend is the more frequent intervention of third parties in negotiations. This may be local, regional or national politicians associating themselves with these conflicts to gain political approval. More recently, individuals or groups have begun offering their advisory services to local communities on protest and negotiation strategies, in return for a share in any economic gains from the conflict.

d) Emergence of new government conflict management models

Over the past 10 years, the Peruvian government has focused on dialogue tables as a means of resolving conflict. For some time, this was considered innovative, facilitating direct dialogue among communities, companies and local government and generating direct commitments to deal with mining-related concerns and aspirations. However, the approach has changed, and the dialogue tables have effectively become negotiation tables, whereby their accepted function in practice is to enable communities to impose their demands (founded or unfounded).

What can be observed is that the focus of dialogue tables has become negotiation, where the parties are usually meeting after conflict and often a crisis event, so the resulting commitments are often not founded on rational baseline or feasibility studies. The resulting inappropriate commitments combined with slow government implementation generates further conflict.

The data and interviews suggest that this model has reached the end of its useful life and a new focus is being sought, as evidenced by the dismantling of dialogue tables. It is expected that the government will develop a new model or mechanism for preventing and managing these conflicts[57].

e) Emergence of lawsuits brought by indigenous peoples against the granting of mining concessions and environmental approvals for failure to conduct prior consultation

The increasing number of lawsuits around mining concessions granted or EIA approvals in areas with Indigenous populations is seen as an emerging trend in the mining sector. For example, the Constitutional Court of the Superior Court of Justice of Lima's ruling regarding the lawsuit filed by the Awajún and Wampis indigenous peoples for lack of prior consultation in the Afrodita and Adriana mining projects declared 111 mining concessions void and the administrative acts that approved their environmental certification.

Both in the specific case of Indigenous Peoples – where the role of the State should be to promote agreement making in prior consultation processes with regard to legislative and administrative measures that could significantly affect their lives – and regarding public participation more widely, the Peruvian government has shown a constant tendency to avoid or minimise the participation and consultation aspects of environmental assessment processes for mining sector projects. The view is that this causes delays and risks around negotiation that prolong some licencing processes.

[57] By September 3,169 commitments by the government have been registered, 49% have been fulfilled.

For example, in May 2013, Supreme Decree 054-2013-PCM introduced the Technical Sustainability Report, an instrument that seeks to simplify the approval of modifications to an Environmental Impact Assessment. After this, various major projects introduced environmental or social changes in their EIAs without needing to follow a public consultation process.

The use of this instrument has been seen by various interest groups as an evasion of government and company responsibilities to guarantee adequate participation in major projects. This problem led to the presentation in the courts of a series of legal actions demanding the incorporation of participation and consultation, particularly in relation to potential impacts on the collective rights of First Nations in different regions of the country.

Recently, courts have ruled in favour of the complainants in some of these cases. For example, the court annulled the concessions and environmental studies in the Condor Mountains because they had not followed prior consultation procedures. This decision is seen as setting a precedent that could have repercussions not only in the existing legislation around new projects[58]. There are current demands to enable mining concessions and licences granted since 1995 (when Peru ratified ILO Convention 169) or since 2011 when the law on prior consultation was passed, to be sanctioned retroactively.

3.3 Environmental

Global trend 3: Climate change and resource scarcity

Climate change is making weather patterns highly unpredictable. Water is the primary medium through which climate change influences Earth's ecosystem and thus the livelihood and well-being of societies. As demand for water increases, the availability of fresh water in many regions is likely to decrease because of climate change. Global climate change is expected to exacerbate current and future stresses on water resources from population growth and land use and increase the frequency and severity of droughts and floods. It is anticipated that climate change will affect the availability of water resources through changes in rainfall distribution, soil moisture, glacier and ice/snow melt, and river and groundwater flows. Water-related hazards account for 90% of natural hazards and their frequency and intensity is rising, with serious consequences on the economic development.[59]

Implications for mining:

3.1 Pressure on water, land use and energy

It is anticipated that due to the combined pressure of population growth and climate change, the access to water, land and energy will become increasingly contested. The mining industry will be in more intense competition with the agricultural sector for land and water. Consequently, the cost of these inputs to the mining industry is likely to increase. Integrated land and water use planning has become a vital tool for managing competing interests and mitigating conflict over scarce natural resources. Innovations in land rehabilitation, and water and biodiversity management may offer new ways to reduce the negative environmental impacts of mining.

[58] https://www.enfoquederecho.com/2019/06/04/poder-judicial-nulas-concesiones-mineras-y-eia-por-falta-de-consulta-previa-en-la-cordillera-del-condor/

[59] United Nations World Weather Assessment Programme, Global Water Resources under Increasing Pressure from Rapidly Growing Demands and Climate Change, According to New UN World Water Development Report, WWDR4 – Background Information Brief.

Implications in Peru:

a) *Increase in desertification and water stress in coastal water catchments and those on the Pacific slopes of the Andes. Intensification of competition for access to water resources.*

In the coming years, it is expected that conflict around water resources will continue and escalate, as Andean glaciers continue to melt, and the coastal basins of the Pacific slopes become increasingly arid.

According to data from the MINAGRI[60], only 2% of the total volume of fresh water comes from the Pacific slopes, where 60% of the Peruvian population lives, concentrated on the country's coastline. These slopes host 1,129 glaciers and 62 catchments. The rate at which glaciers are receding in Peru is one of the highest on the planet. It is estimated that in the next 10 years all glaciers below 5,000 metres above sea level will be gone.

Furthermore, in various coastal zones within these basins, large industrial agricultural activities are intensively using major ground water reserves that are now showing levels of exploitation above their natural refill capacity. In addition, for 2030, SENAHMI calculates that rainfall in the central coast will drop by 30% and 20% along the southern coast[61].

The receding of glaciers and reduction in rainfall and aquifers will directly affect water availability. Andean glaciers ensure a water reserve that feeds rivers and ground water during the dry season in the Pacific basin. In the short term, the accelerated melting of glaciers in the Peruvian Andes will generate excess run-off that could cause lakes to overflow, landslides and erosion during the rainy season, particularly since few of these catchments are regulated by dams. But as the mass of reserve water in glaciers is reduced, there will be a large scale and irreversible reduction of water in rivers and underground aquifers during dry seasons that will seriously affect human activity and ecosystems in the pacific catchment[62].

In this context, current mining operations and projects will face greater competition with agriculture or expanding urban areas over water resources.

b) *Strengthening of technical and political capacities of national water resource management systems*

Over the past 10 years, significant progress has been made in the generation of natural resource policy and governance instruments and regulations, prompted by the creation of the Ministry of the Environment. There is a National Environmental Policy implemented through a National Environmental Management System. This regulates the functions of various intersectoral bodies for the coordinated implementation of national strategies, including the National Water Resource Plan and Strategy. There are approved laws and regulations, and associated technical bodies have been set up within a National Water Resource Management System. They are developing baseline studies and models for every basin in the country, as well as effective evaluation and supervision processes.

The foreseeable trend for the next 5 to 10 years points to the consolidation of technical and political tools and capacities for structured, rigorous and transparent governance of water resource

[60] UNDP. Peru Human Development Report 2013. Climate change and land: Challenges and responses for a sustainable future
[61] ANA. National Water Resource Plan 2013.
[62] GONZÁLEZ MOLINA, Sonia (dir.) ; VACHER, Jean-Joinville (dir.). El Perú frente al cambio climático: Resultados de investigaciones franco-peruanas. Nueva edición [en línea]. Marseille: IRD Éditions, 2014 (generado el 04 octubre 2019). Disponible en Internet: <http://books.openedition.org/irdeditions/19580>. ISBN: 9782709919074. DOI: 10.4000/books.irdeditions.19580.

access and use in the country. While mining sector water consumption represents around 1% of national water demand, these state-level management processes will require companies to improve their project design processes and invest in new and better technologies to deal with more complex and stricter permitting and compliance procedures in coming years.

It is probable that these improvements in water use techniques and the implementation of more efficient and transparent state monitoring and supervision systems will contribute to allaying stakeholder concerns and distrust around water availability and quality in mining regions.

c) *Increased pressures to limit the development of mining activities in high Andean water catchment headwaters*

In recent years, the social and political sectors that are critical of the extractive industries, have taken the issue of water as one of their most effective arguments to mobilize opinion at local, regional and national levels. Political groups represented in Congress have generated proposals and approved standards aimed at limiting the granting of operating permits to mining companies located near catchment headwaters. In August 2017, Law 30640 was passed, modifying specific sections of the 2009 Water Resources Law to recognize catchment headwaters as environmentally vulnerable areas and proposing that the National Water Authority (ANA in Spanish) be able to declare these areas as “no-go” areas, preventing the use or diversion of water resources and forbidding discharge of waste[63].

This type of proposal could mean excluding more than 8% of the country (areas over 3,500 metres above sea level), from various uses, including mining. The National Water Authority has proposed a methodology to determine the geographical limits of basin headwaters and to estimate their risk of impact. Various public and private bodies have discussed this proposal, with a focus on mining, and modifications to the proposed methodology should pass through a final consultation phase in 2019.

It is reasonably probable that the result will be a technical process to delimit and assess potential impacts in basin headwaters. In theory, this will not exclude specific uses, but rather provide a scale of preventive and compensation measures for impacts on environmental services, allowing the possibility to impose very specific exclusion zones when there is a high potential risk. Mining projects would not necessarily need to be excluded from access to land in headwater areas, but they would have to integrate better controls and safeguards into their design, including the possibility of avoiding using areas of high vulnerability.

It is probable that during the coming years, situations of water stress as a result of climate change will significantly affect the quantity and quality of water available in various basins that could lead to higher levels of concern around determining use of available water and conflict around mining in areas higher up in the Andes.

d) *Persistence of tensions and conflicts over land access and usage rights and attributions for mining activities.*

According to the current legal framework, the State owns resources below ground and is responsible for granting mining concessions. However, this does not include surface rights, which is why mining companies carrying out exploration activities must reach agreements around access to land, initially on a temporary basis and then permanently once there is certainty around development of an operation. Access to surface ownership is one of the most complex issues for

[63] https://busquedas.elperuano.pe/normaslegales/ley-que-modifica-la-ley-29338-ley-de-recursos-hidricos-med-ley-n-30640-1554967-3/

mining activities, due to the potential overlapping layers of rights that may be involved. There may be Campesina communities that have collective ownership over land, which community members can then distribute in the form of usufruct rights to individuals, creating an overlay of individual and collective rights. Therefore, companies often establish two negotiation processes for the same land: one with the owner (the community) and one with those who have usage rights.

Because it is difficult to formalize ownership, companies often lack certainty over whether they are conducting negotiations with the owner, or if there are other people who may have some form of claim over the land under negotiation (which may be associated with local traditions and customs).

There can be issues around overlapping ownership between private and community owners, communities without official title, or areas where communities are in conflict over boundary lines. In addition, there are ever-increasing expectations around negotiation outcomes.

At the same time, companies in recent years have improved their approaches to land access, focusing not only on paying a fair price for land (whether paying rent or purchasing permanent access) but also on supporting and advising landholders on how to use the resources they have negotiated. This practice is increasingly taken up by companies, however it is not clear how extensive it is as companies tend to keep negotiations confidential.

Companies have a limited understanding of resettlement issues, as many consider it to be a voluntary issue, or as a requirement of IFC financing. It is not perceived as a measure for managing issues of land access. Implementation causes concern, particularly considering the complications engendered by the Fuerabamba resettlement by Las Bambas project, seen as extremely expensive and conflictual. There is little experience of mining resettlement in Peru. The government seeks to manage it through the environmental management instruments in the SENACE, which would increase the rigour in evaluating land access impacts, in ensuring effective management measures and in monitoring implementation.

There is a historical and sustained claim by Indigenous and Campesina communities before the State, to conclude the process to grant them title to their lands. This process is progressing, but in a discreet manner.

In 2017, 97% of Campesina communities recorded in the census were recognized by some public entity, however, 20% did not hold title to their land, 36.7% claimed to be involved in disputes over their land with other communities or private entities (only 12% of these disputes involved mining companies)[64].

Unlike the institutional governance processes for water resources, the institutional systems underlying land planning, ownership and usage priorities and rights have not yet achieved an adequate integrated process including policy, coordination, and supervision instruments and bodies.

Even though regional planning is included in the design of the National Environmental Management System, consensus has not been reached on a specific public body that would be responsible for harmonizing the diverse sectoral priorities for the region. For the moment, different functions associated with such management are scattered among organisations at different levels in more than one sector of the Executive Power. In parliament there are at least five different projects to draft a land planning law, which in almost seven years have not managed to progress beyond discussion in commissions. In terms of implementation, in the last 10 years, at least 15

[64] INEI. 1er Censo de Comunidades Campesinas. Resultados definitivos. Diciembre 2018

regions around the country finalized and approved ecological economic zoning studies, but have no approved land use plan based on these studies.

The foreseeable trend for coming years suggests little probability of consolidation of these inconclusive processes for standardising and institutionalising some form of integrated land planning. This will mean that issues around overlapping usage rights for productive and service activities (mining, oil, forestry, fisheries, power generation etc.) and public, private and collective ownership rights (titling of rural and urban properties, conservation and protection areas, Indigenous lands, Campesina communities etc.) will persist. For example, in 2014, 16% of community land in the Cusco region lay within mining concessions, as did 38% in Puno region and more than 52% in Arequipa[65].

This disjointed articulation of agreed priority frameworks will continue to generate inaccurate perceptions, concerns and demands around the rights attributed by the State to mining companies to assign individual or collective ownership and usage rights to surface land. These perceptions do not consider the fact that granting mining concessions does not imply direct authorisation to use surface land owned by third parties. But misinformation in this sense will contribute to fostering higher degrees of distrust among civil society and raise the transactional costs in concession and permitting processes for developing mining projects.

3.2 Climate smart mining

In order to limit the extent of catastrophic consequences for the planet, countries must decarbonise their energy systems by the middle of this century, at the latest. This transition provides an opportunity for mining companies, as decarbonised energy and transport systems are more mineral intensive than those that rely on fossil fuels. Copper and battery metals (e.g. lithium and cobalt), which stand to gain as the energy mix moves away from combustion engines to renewable energy, are now receiving the bulk of capital investment. In addition, the mining sector is in the process of reducing its own emissions in order to make its contribution to achieving Paris Agreement targets.

Uptake of environmental sustainability measures will be vital to gaining and maintaining environmental approvals and social acceptance, as public concern for the environment intensifies. Institutional investors are getting serious about the portfolios they are engaging with, for example, the Norwegian sovereign wealth fund and the Church of England are no longer investing in fossil fuels. The launch of the World Bank Climate Smart Mining Facility is an opportunity to reshape public perceptions of mining – from being part of the problem to part of the solution – providing the materials essential to low carbon energy transition. Demand for most minerals is forecast to increase in order to support the sustainable energy transition.[66]

Implications in Peru:

a) Low pressure due to change of energy matrix

Access to energy in the country is not emerging as a topic that will generate conflict. The country has considerable potential renewable energy resources[67], of which only a small fraction is currently commercially exploited. A transition to a cleaner energy system can be foreseen in coming years.

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[65] Ordenamiento Territorial en el Perú. Alcances y retos para las regiones y el país. Grupo Propuesta Ciudadana, Lima. 2014.
[66] Ali, S.H., Giurco, D., Arndt, N., Nickless, E., Brown, G., Demetriades, A., Durrheim, R., Enriquez, M.A., Kinnaird, J., Littleboy, A. and Meinert, L.D., 2017. Mineral supply for sustainable development requires resource governance. *Nature*, 543(7645), p.367.
[67] More than 70 GW and 20 GW from hydro and wind power respectively.

This aligns with the Ministry of Energy and Mining's energy policy and with Priority Objective 9 of the National Competitiveness and Productivity Plan of the Ministry of Economy and Finance.

b) Opportunity to opt for the use of renewable sources in mining operations in Peru

Although the participation of renewable energies in Peru's power supply has been limited, with barely 0.5% annual growth and which today represents only 4.7% of national power generation[68], this situation is about to change radically, offering an opportunity for the mining sector, the main electricity consumer in the country[69] – both in terms of reducing operating costs and in energy security.

The current situation will speed up the energy transition towards low GHG generating sources in the coming years, at the same time enabling mining companies to align with their global sustainability objectives. This has to do with two current factors:

- The energy deficit scenario which would raise the cost of electricity as they would have to bring diesel plants online. This scenario is due to the lack of investment in new power plants. Such investment is currently planned by the COES[70] for 2025 or 2022, the latter if mining projects are reactivated and GDP growth returns to figures of 6-7%[71].
- Recent regulatory reform, in force since 1 September 2019[72], making it possible for the first time for power plants using renewable sources to sign contracts with distributors and private clients (such as mining companies). With this, a significant barrier to entry into the electricity market has lifted. This will not only enhance competition in the power generation market but will also promote the use of clean energies and take advantage of their lower prices, resulting in enhanced operating efficiencies for companies.

The trend in the coming years will be that large mining companies in Peru can contract providers using renewable energy sources, mainly wind power, thus reducing their carbon footprint. They can also demonstrate their use of clean energy to clients, which is particularly relevant for those commodities that require sustainable environmental traceability in the production process.

c) Increase in the positioning and role of Peru as a supplier of lithium and unconventional minerals

Peru's role in the provision of the unconventional minerals required for future technological applications, could break the so-called *lithium triangle* (made up of Argentina, Bolivia and Chile because of their large reserves of this mineral) to create a quadrangle that includes Peru. Early exploration work for rare earths has begun[73] with no conclusive studies completed to date[74],

[68] COES–Comité Operación Económica del Sistema Interconectado Nacional. Estadísticas Anuales. http://www.coes.org.pe/Portal/Publicaciones/Estadisticas/

[69] The mining sector is the third largest energy consumer nationally.

[70] The *Comité Operación Económica del Sistema Interconectado Nacional* or COES (national grid economic operation committee) is made up of all the elements of the national electricity grid (generators, transmitters, distributors and users). Its role is to coordinate short, medium and long term operation of the national power system as economically as possible, maintaining the safety of the system and making the best use of energy resources.

[71] https://larepublica.pe/economia/1431488-peru-sufrir-deficit-energia-proximos-6-anos/

[72] http://www.osinergmin.gob.pe/Resoluciones/pdf/2019/Osinergmin-144-2019-OS-CD-EP.pdf

[73] Companies that have carried out some early exploration of rare earths are Alturas Minerals in Huancavelica, Peruvian Strategic Metals (Pstrametals) in La Chicama (La Libertad) and Río Sol in Cusco.

[74] OSINERGMIN – Gerencia de Políticas y Análisis Económico – GPAE. Tierras raras: Análisis del mercado global. Reporte de Análisis Económico Sectorial Minería. Año 9 – N° 11 – junio 2019.

however, this is not the case for lithium, thanks to Macusani Yellowcake's discovery of the Falchani deposit[75].

The Falchani deposit is the most extensive discovery of underground uranium in the world, covering an area of 930km². Lithium will be extracted using a mineral process involving radioactive uranium and will constitute the sixth largest rock lithium resource in the world. In March 2019, the company reported resources of 4.71 million tonnes of lithium carbonate. Project development will involve an investment of more than $800 million USD and its commercial operation is planned for 2021.

Nonetheless, a series of challenges will have to be overcome to take advantage of this opportunity. The first concerns the lack of standards for developing minerals such as lithium and uranium. Another concerns the lack of a national policy to create the conditions conducive to lithium production development in Peru.

Recently, the Ministry of Energy and Mines announced that it was working on a general draft bill as well as evaluating alternatives for mining and industrializing lithium[76], but the state of progress is not known.

3.3 Circular economy

The mining industry is one of the largest generators of waste globally. In the last decades, ore grades have been declining, resulting in an increasing production of waste. The approach to resources and waste use requires a rapid evolution.[77] The traditional linear mining process of digging up ore, processing minerals and metals, producing the final product and disposing of any waste follows an economic model known as take, make, dispose. In a majority of cases, mining companies cease operations before having exhausted the ore body, with limited long-term vision and planning for the future use of the remaining minerals and waste.[78] New approaches encompassing the entire mine lifecycle perspective and the principles of circular economy create opportunities for new business models. This encourages creating value from mining waste, reducing environmental liability from wastes streams along the value chain, and developing local enterprises.[79] This approach is beginning to gain traction in the mining industry. For example, three International Council on Mining and Metals (ICMM) member companies based in Japan have taken multiple steps to embed a circular economy approach in various areas of their business and operations.[80]

Implications in Peru:

a) Limited adoption of circular economy approach in mining operations.

In Peru, mining companies have not yet turned their focus to the circular economy[81]. Initiatives to transform the waste generated by mining into new products to benefit the companies are yet to be

[75] This Company is a subsidiary of the Canadian Company Plateau Energy Minerals.
[76] Ísmodes, F. Presentación del Ministro de Energía y Minas a la Comisión de Energía y Minas del Congreso de la República. Agosto 2018.
[77] Mudd, G.M., 2010. The environmental sustainability of mining in Australia: key mega-trends and looming constraints. *Resources Policy*, 35(2), pp.98-115.
[78] Laurence D, 2011, Establishing a sustainable mining operation: an overview, *Journal of Cleaner Production*, 19:278-284.
[79] Tayebi-Khorami, M.; Edraki, M.; Corder, G.; Golev, A. Re-Thinking Mining Waste through an Integrative Approach Led by Circular Economy Aspirations. *Minerals* 2019, 9, 286.
[80] ICMM, The 'circular economy' in mining and metals.
[81] In Peru, this approach is mainly being applied by a few companies of the third sector (supermarkets, transport companies etc.).

integrated into the business model, despite the potential that they could, for example, offer tailings to produce inputs for construction, rare metals or others[82].

Nonetheless, the document *Peru Mining Vision 2030*[83] does propose that mining be developed in an environmentally sustainable way, including potentially, the promotion of the circular economy in the development of their activities.

To date, the plans to guide the country's mining vision to 2030 have not been developed. The only concrete initiative is the definition of a roadmap for the circular economy for national industry, led by the Ministry of Production (PRODUCE)[84] , which it is hoped will come into force in 2020. The mining sector representatives interviewed did not indicate that this topic was currently a priority for Peruvian companies.

This effort is also in line with the National Competitiveness and Productivity Plan approved at the end of July 2019, in force until 2030[85] that includes the promotion of the circular economy in the industrial sector and clean production agreements with the fishing and agriculture sectors among its priority political measures.

3.4 Tailings management

The management of tailings, both during and after mining, is the responsibility of mining companies and is subject to advanced regulatory regimes. Tailings management needs to be effective throughout the life of an operation, from initial feasibility through to closure and post-closure. As illustrated above, the mining industry has come a long way in improving how it operates: enhancing safety for mine workers and the communities living nearby, developing new approaches to protecting the environment, coming up with new ways of including and supporting local communities, and helping host economies grow in a sustainable way. However, as the catastrophic tailings dam failures at Mount Polley (Canada) in 2014, Samarco (Brazil) in 2015 and Brumadinho (Brazil) in 2019 remind us, much more needs to be done to safeguard lives, improve performance and demonstrate transparency.

While most ICMM member companies have corporate guidance documents that meet and sometimes go beyond what would be considered to be good practice in tailings management, this may not be the case among non-ICMM members.[86] In 2019, ICMM is working with the United Nations Environment Programme (UNEP) and the Principles for Responsible Investment (PRI) to co-convene an inclusive global tailings review for the purpose of establishing an international standard for tailings storage facilities. Beyond the international standard, the review may also make broader recommendations for industry, governments, international institutions and the investment community to secure the safe operation of tailings storage facilities.[87]

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[82] Dold, Bernhard. Conferencia: Innovación e investigación para una minería sostenible. http://iimp.org.pe/boletinJM/conclusiones-JM-394.pdf

[83] RIMAY – Centro de Convergencia y Buenas Prácticas Minero-Energéticas. Visión de la Minería en el Perú al 2030. Lima, febrero 2019.

[84] This document will contain measures regarding re-use, re-manufacture and recycling, and will identify sectors that could make a gradual transition to a circular economy. The initiative is being developed in Coordination with the Ministry of the Environment (MINAM) and with the technical support of the UN Industrial Development Organisation (UNIDO).

[85] Decreto Supremo Nº 237-2019-EF. (2019). Plan Nacional de Competitividad y Productividad. https://www.mef.gob.pe/contenidos/archivos-descarga/PNCP_2019.pdf

[86] International Council on Mining and Metals (ICMM), Review of Tailings Management Guidelines and Recommendations for Improvement, December 2016.

[87] See https://globaltailingsreview.org/.

Implications in Peru:

a) Increase in the supervision of tailings dam operation and in the adoption of international standards and guidelines in Peruvian industrial mining

In Peru, there is a trend towards greater supervision of tailings dam operations by the OSINERGMIN, the institution responsible for supervising the safety of large and medium scale mining infrastructure. In 2018 OSINERGMIN increased its operative supervision of tailings dams by 38%, over 2017[88]. It gave priority to the inspection of specific mining units and components, in accordance with principles and guidelines of the Organisation for Economic Cooperation and Development (OECD).

Similarly, within its remit, it is understood that OSINERGMIN is insisting that companies use the latest technology monitoring systems to improve operations. It is also encouraging companies to apply the international safety standards, norms and guidelines such as those disseminated by the Canadian Dam Association (CDA) or the International Commission on Large Dams (ICOLD). Note that some companies in Peru have already adopted these practices at a corporate level[89].

It should be noted that Peruvian standards are very strict regarding tailings dam design, mainly due to the fact that Peru is one of the countries with greatest seismic activity in the world[90]. For instance, the faults in the Samarco and Brumandinho tailings dams in Brazil were due to the downstream design method of their construction[91]. This construction method has been prohibited in Peru since the end of the nineties[92].

Finally, it is understood that the major threat regarding tailings management will principally come from informal mining that does not comply with tailings storage regulations laid down by the Ministry of Energy and Mines. The other, no less important factor is the fact that there are almost 9,000 mining legacies in the country – some of these are tailings dams – left over from mining operations of the past 80 to 100 years. Their environmental remediation by Mining Assets SA (AMSAC)[93] depends on financing and priorities set by the Ministry.

3.5 Increasing environmental regulation

Surface and underground mining can have severe environmental impacts by disrupting the landscape, removing vegetation and topsoil, contaminating the air with dust and toxic substances and causing toxic compounds in mining spoils to percolate into the groundwater. Regulation is necessary to prevent mining facilities from damaging the environment. Existing environmental regulations that apply in the mining industry differ from country to country. The first ever report on environmental policies worldwide, released by the United Nations in January 2019, found that all countries have at least one environmental law or regulation in place, yet very few nations comply with them.[94]

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[88] https://www.horizonteminero.com/osinergmin-incrementa-supervision-a-presas-de-relaves-mineros-en-38/

[89] https://www.horizonteminero.com/mirando-a-las-presas-de-relaves/

[90] https://gerens.pe/blog/la-importancia-de-la-calidad-de-construccion-y-monitoreo-de-presas-de-relaves-mineros-esta-en-nuestras-manos-evitar-grandes-desastres/

[91] This method is common in the construction of tailings dam because it is low cost. It involves construction in stages that builds on the deposited materials (tailings) so as to incorporate them in the dam structure.

[92] https://www.energiminas.com/una-falla-en-la-relavera-y-la-mina-puede-irse-a-la-bancarrota-y-los-duenos-a-la-carcel/

[93] AMSAC is a State-owned company under private law. One of its activities is to remediate mining legacies as directed by the State through the MINEM.

[94] United Nations Environment Programme (UNEP), *Environmental Rule of Law: First Global Report*, 2019.

In mining jurisdictions where environmental law or regulations are not well enforced, mining companies are often not held responsible for the contamination of water, air and land. In addition to environmental pollution and degradation, this can create conflict with local communities, whose livelihoods depend on the health of the local environment. Mining companies face increasing pressure around the world to minimise environmental damage associated with their operations.

Implications in Peru:

a) *Consolidation in the development of standards and institutions responsible for environmental regulation.*

Peru's international commitments around trade agreements and climate change prevention and adaptation have led to greater regulation.

From 1990 there was a change in Peru's economic model, opening the way for private investment and an increase in mining projects. Environmental standards and the government institutions dedicated to environmental protection developed in parallel to this process[95] [96].

Peru has been a signatory of the United Nations Framework Convention on Climate Change (UNFCCC) since 1992, which it ratified in 1993. In 2002, it signed up to the Kyoto Protocol. Furthermore, in 2006 it signed the Peru-USA Free Trade Agreement, which, together with other FTAs the country has been signing, include various environmental commitments.

Therefore, it is predicted that Peruvian mining activity will develop within an increasingly strict context of environmental regulation, given that the Peruvian environmental institutions have increased their role of evaluation, supervision and sanction.

In 2008, the Ministry of the Environment was created as well as the Office of Environmental Evaluation and Inspection, an entity under the new ministry. The Office oversees compliance with the Law on the National Environmental Evaluation and Monitoring System (2009). Within the framework of this new law, the environmental supervision, inspection and sanction of mining have been transferred to the Office from the Energy and Mining Investment Supervisory Body (OSINERGMIN, part of the Ministry of Energy and Mines). The inspection activities of the Office began in 2011[97].

Environmental certification processes have also become stricter with the creation at the end of 2012, of the National Department of Environmental Certification for Sustainable Investments (SENACE). From the end of 2015, SENACE has been responsible for evaluating the Detailed Environmental Impact Studies that are applied to most large mining projects. Recommendations from environmental evaluations carried out in Peru point to strengthening these organisations and ensuring the independence of the environmental evaluation and supervision process[98]. Thus, in terms of institutional arrangements, responsibility for environmental control and evaluation of mining projects has gradually been transferred to entities situated outside the scope of the Ministry of Energy and Mines, as a means of seeking greater transparency of government supervision.

Interviews with government officials indicate that the institutional system for the environment is being built in an organized and consistent manner as part of the National Environmental Management System. This increase in environmental requirements coincides with improvements in

[95] Banco Mundial (WB), Análisis Ambiental del Perú: Retos para un desarrollo sostenible, Mayo 2007

[96] Aldana, Martha. La Fiscalización Ambiental en el Perú: Orígenes, Estado Actual y Perspectivas Futuras, En: *Revista Derecho y Sociedad 41* (pp.323-340). Lima, 2013. http://revistas.pucp.edu.pe/index.php/derechoysociedad/article/view/12783

[97] Ministerio del Ambiente (MINAM), *La fiscalización ambiental en el Perú* (2011 – 2015), Febrero 2016

[98] OCDE / CEPAL, Evaluaciones del desempeño ambiental PERU 2016, Aspectos destacados y recomendaciones, Mayo 2016

the selection and capacity building of government employees responsible for assessing and supervising environmental studies. Some interviewees consider that these changes in environmental regulations are generating greater public trust in environmental controls.

In the case of Peruvian mining, these increased environmental requirements include stricter social standards, as a government response to social conflicts (see Trend 2). In the next 10 years, it is considered that it will be necessary for socio-environmental consulting companies and the mining companies themselves to adapt to these requirements, even more so due to the processes of environmental permitting.

It should be clarified that, despite improvements in environmental regulations and institutional systems, the regulation of environmental and social closure of mines (closure plans), and the supervision and control of operating mining projects is still limited. There is a need for more control of environmental mining legacies (under the responsibility of the Ministry of Energy and Mines[99]). These elements will be essential for providing more transparency around environmental controls.

For mining activities in Peru, social management of mining projects and restoring trust in government are considered indispensable. This trust is not about compliance with environmental standards. It concerns the perception that companies and government officials are involved in corrupt practices, the fact that standards are not being met (as in the case of remediating mining legacies[100]), and the view that companies are engaging in deceptive practices with regard to the community.

3.4 Technological

Global trend 4: Increasing pace of innovation and uptake of new technology

"The combination of the internet, network capable mobile devices, data analytics, cloud computing, and machine and deep learning capabilities will continue to transform our world."[101]

Implications for mining:

4.1 The impact of digitisation and automation on labour and operations

Automated mining operations provide an opportunity to improve occupational health and safety standards of mining. At the same time, automated operations also reduce employment needs to a smaller, more highly skilled, workforce. Constantly evolving technologies and business models require a mining workforce with new skills.[102] The mining sector is increasingly collaborating with the IT sector to attract top talent from universities to drive its digitisation and automation processes.[103]

Governments and mining companies are faced with developing strategies for transitioning workers who cannot be absorbed by an automated mining sector into new activities through retraining and

[99] https://peru21.pe/economia/peru-hay-8-000-pasivos-ambientales-mineros-minem-414706
DS Nro 013-2019-EM: Modificacion del Reglamento para el Cierre de Minas
[100] http://cooperaccion.org.pe/los-pasivos-mineros-de-hualgayoc/
[101] PricewaterhouseCoopers, Five Megatrends and their Implications for Global Defense and Security, November 2016.
[102] Holcombe, S. and D. Kemp (2018) Indigenous Employment Futures in an Automated Mining Industry: An Issues Paper and A Case for Research. Centre for Social Responsibility in Mining, Sustainable Minerals Institute, The University of Queensland: Brisbane.
[103] EY, *The Future of Work: The economic implications of technology and digital mining*, a report for the Minerals Council of Australia. Minerals Council of Australia, Canberra, 2019.

transitioning programs.[104] The speed at which mining companies are able to roll out new technologies is closely linked to host government and labour union acceptance of reduced employment and procurement opportunities. It is becoming increasingly important to involve these stakeholders in decision-making around the transition and in developing policies to support those who are likely to be negatively affected by automation.

Implications in Peru:

a) Limited impact of digitization and automation on the workforce

Over the past 20 years, half the mines in Peru have been implementing technological solutions for automation and control in their processes. The pressure to be competitive and continually improve productivity are the main drivers of digitalisation.

However, to date little impact can be perceived of digitalisation and automation of mining processes in Peru in terms of reducing employee numbers. The reasons for this are mainly:

- The Peruvian mining sector is conservative, and takes longer to adopt new technologies, waiting to see experience of implementation from other countries[105].
- The application of technological changes depends on the type of operation of each mine (for example in a greenfield project, it is more feasible to adopt new technologies as they are not constrained by existing operations). Likewise, topographical and meteorological characteristics must be borne in mind. They affect the development of mine locations, involving a series of restrictions considering 70% of mining activity in Peru happens over 3,500 metres above sea level.
- The incorporation of technology is strongly related to the vision of each company regarding the balance they wish to maintain with their workforce. To date there have not been any claims submitted by workers' unions around job losses due to process automation.

Therefore, it is considered that the digitization and automation trend in the Peruvian mining sector will continue to have a moderate impact in the coming years.

3.5 Economic

Global trend 5: Realignment of global economic and business activity from West to East, notably the rise of China

"International *trade* will continue to grow unabated. The increasingly multi-polar world created by the shift from largely Western-led organizations to regional players may reshape the competitive environment for business."[106]

[104] Cosbey, A., Mann, H., Maennling, N., Toledano, P., Geipel, J. and Brauch, M. D., 2016. Mining a mirage? International Institute for Sustainable Development, Manitoba.
[105] https://elcomercio.pe/economia/dia-1/digitalizacion-camino-reducir-co2-noticia-595089
[106] PricewaterhouseCoopers, Five Megatrends and their Implications for Global Defense and Security, November 2016.

Implications for mining:

5.1 Shift in global economic power causing volatility of global commodity prices

Changes in the global balance of power from North America and Europe to China and India (and to a lesser extent Russia, Brazil and other emerging economies) has increased competition and uncertainty about demand and supply of critical materials.

Mineral commodity prices are inherently more volatile than many other products simply due to their price inelasticity. In other words, if the demand for copper suddenly surges, the global output cannot respond immediately. Mines must be approved, investors found, and infrastructure built or expanded. Likewise, manufacturers downstream cannot always substitute one metal for another when prices rise or fall. The effect of volatility is generally considered negative because it brings uncertainty about future price levels.

Beginning in around 2002, commodity markets entered a strong and sustained uptrend. By its peak in mid-2008, this upswing had seen the prices of almost all classes of commodities rise substantially. From July 2008 to March 2009, commodity prices fell precipitously, reversing most of the gains made over the preceding years.[107] Over the next five years, because of the collapse in prices, capital expenditure of 40 major global mining companies contracted by one-third.[108] A downturn in commodity prices has created a situation in which cost reductions and operational efficiency have become a necessity for mining companies. While the mining industry had since recovered from one of the most difficult periods in its history, judging by recent trends, prices of mineral commodities are likely to remain highly volatile.[109]

Implications in Peru:

a) *In the coming years, it can be expected that Peru will increase its dependency on China as the major destination of its mining exports.*

Three of Peru's five main export destination countries are in Asia; more than 40% of national exports go to countries in this region. China alone receives 26% of exports, which is approximately equivalent to the total of Peruvian exports to the USA and Europe combined. Almost 60% of Peruvian exports are from the mining sector, with more than 70% of total exports to China in 2018 consisting of copper concentrate.

The increasing geopolitical and trade tensions between the world's two largest economies, and Peru's main trading partners, could affect demand and price of the very commodities produced by most of the mining companies operating in the country. This would cause very high volatility both for the national mining sector and for the country.

The effect of trade wars and the ensuing changes in supply chains of inputs and products, does not necessarily mean that the price of some commodities will fall. Depending on the sector and the product, they may generate benefits for some producing countries or companies that will replace a supplier sanctioned by tariffs[110].

Nonetheless, in the case of the mining sector, copper as a commodity is considered one of the main barometers of global economic conditions due to its use as an input in sensitive sectors such

[107] Australian Government, The Treasury, *Commodity Price Volatility*, Economic Roundup Issue 1, 2011, 29 March 2012.
[108] PricewaterhouseCoopers, Mine 2016: Review of Global Trends in the Mining Industry, 2016.
[109] S&P Global, Industry Top Trends 2019: Metals and Mining, 12 November 2018.
[110] Fitch Solutions Group (2019). Trade War Impact On Commodities: Winners, Losers And What's Next? https://www.fitchsolutions.com/corporates/commodities/trade-war-impact-commodities-winners-losers-and-whats-next-26-07-2019

as manufacturing, transport, construction and energy. Any slowdown in China's economy, the main global importer of copper, in the face of tariffs on its exports in other markets, would impact on these sectors. In the past this has led to immediate falls in international prices, the value of mining company shares and income from exporting countries[111].

b) As well as being a destination for mining exports, China will tend to increase its investment portfolio in Peruvian mining and infrastructure.

Chinese companies have acquired, or shown interest in acquiring, major mining projects and operations in Peru over the past 10 years. Some of the largest mining projects in the country are already operating under Chinese head companies (as is the case of Toromocho and Las Bambas). For the period between 1992 and 2018, Peru was the second largest destination of Chinese investment in Latin America (18,400 million USD) after Brazil. Projected investment for the next five years includes no less than an additional 10,000 million USD, half of which is in mining as well as interests in ports, telecommunications and transport.

In the medium term, it is possible that trade and political skirmishes between China and the USA will affect availability to sustain the level of Chinese investment in the Peruvian mining sector. Forecasts suggest that these investments will not stop, however the pace may slow down.

In line with estimates of the International Monetary Fund, the most important consequences of the trade war between the two largest world economies are not so much the impacts on GDP, as the impact on investor risk assessments and trust, which could threaten the stability of supply chains and prices. Also, China may respond to EU protection measures by reorienting resources towards implementing stimulation policies[112] and compensation funds to maintain its industry, which would reduce Chinese government and company funds available to maintain or extend investment in other regions.

Although the practices of Chinese mining companies operating in Peru vary, there is a widely held perception that Chinese mining companies investing in the country do not have the best social responsibility standards (employment, health and safety, community relations and community investment). This is claimed by reports and demands brought before organisations like the United Nations by mining watchdog organisations, attributing a variety of management and sustainability problems to the main Chinese investments in Peru[113].

c) Growth of illegal gold mining in the country is exacerbated by the trade war between the US and China

Increasing global political uncertainty and trade tensions between China and the United States, with the resulting risk associated with global economic downturn, has increased the value of gold as a safe investment. Increased purchasing of gold as a safe asset began last year, when the geopolitical tensions began; central banks of emerging nations were those buying the most gold. It is seen that there is still space for the price of this metal to continue rising[114].

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[111] Bloomberg Markets (2018) Trade War Sends Commodities to Biggest Drop in 5 Months. https://www.bloomberg.com/news/articles/2018-07-13/commodities-smacked-by-trade-war-with-biggest-drop-in-5-months

[112] Fondo Monetario Internacional (2019). Perspectivas de la Economía Mundial. Informe de actualización, Julio 2019. https://www.imf.org/es/Publications/WEO/Issues/2019/07/18/WEOupdateJuly2019

[113] Sanborn, Cynthia A. y Torres, Víctor C. (2009). La economía china y las industrias extractivas: desafíos para el Perú. Lima: Centro de Investigación de la Universidad del Pacifico, CooperAcción

[114] Scotiabank – Departamento de Estudios Económicos. Reporte Semanal del 26 al 30 de agosto de 2019. Año 20 – Número 31.

In Peru, the recovery of the gold price has led to the expansion of illegal mining activities[115], and of its environmental impacts (release of mercury in rivers, destruction of forests etc.), social impacts (human trafficking), economic impacts (tax evasion) and security impacts (organised crime and drug trafficking)[116]. In the past 15 years, beginning with the price super cycle, the volume of gold exported from Peru exceeded national production, confirming the correlation that as production became more profitable, illegal production of the metal intensified[117]. Current estimates place illegal gold production at 12% of total production in the country[118], just under the mining Company Yanacocha (14%), which is the largest gold producer in Latin America.

On the other hand, growth in illegal mining has caused large numbers of miners to invade third party mining concessions and properties[119]. Similarly, the high mobility of this activity – with informal miners moving around various regions of the country in search of gold – further hampers the government's attempts to curtail the practice. Efforts to formalise the activity led by MINEM through the Integrated Mining Formalisation Register (REINFO), are being misused by illegal miners as permission to invade the land of mining concessions.

Due to these factors, it is expected that illegal mining will continue to be a threat to the formal mining sector in the coming years, mainly affecting security and property rights. The MINEM is developing a proposal for high-level work to eradicate illegal mining in Madre de Dios and a new national strategy to prevent and fight against illegal mining that seeks to improve traceability in the gold trade, as well as conjoint actions with Bolivia along the border areas[120].

d) Cost control will be the main instrument for mining companies to attenuate the effects of high price volatility, potentially affecting their investment in social management.

Mining operations are showing an increasing interest in cost reduction and control particularly since the end of the super cycle of high commodity prices. However, according to interviewees, not all companies have learned the same lesson. On the one hand, there are companies that consider social and environmental investment to be essential to ensuring a sustainable mining operation. However, there are still companies that consider, to varying degrees, that social and environmental investment constitutes an expense, cutting costs in these areas too (including key factors for social performance such as firing experienced staff or cutting direct social investment). This could affect their ability to comply with commitments, thus significantly compromising the sustainability of their operations. While the pace of industry improvement is slow and not free of setbacks, it is expected that progress in this area will continue to be made.

5.2 Access to resources, resource nationalism and 'trade wars'

Mining companies continuously venture into frontier areas to access new resources. As high-grade mineral resources are exhausted, mining companies master new technologies for extracting and processing, and venture into areas where it has previously not been viable to operate. This trend is likely to continue. Deep-sea mining may become the new frontier in the search for deposits and

[115] In Peru, miners are considered to be illegal when they fail to obtain the appropriate permissions, do not comply with relevant standards, work in environmentally protected areas, use heavy machinery without supervision, do not pay taxes or employ workers without contracts.
[116] SPDA – Sociedad Peruana de Derecho Ambiental. "La otra cara del oro: La minería informal e ilegal. Un problema aún por resolver". XII Taller de Derecho Ambiental.
[117] Cuzcano, V. (2015). Minería Ilegal e Informal en el Perú: Impacto Socioeconómico. Cuadernos de CooperAcción.
[118] Scotiabank – Departamento de Estudios Económicos. Reporte Semanal del 19 al 23 de agosto de 2019. Año 20 – Número 30.
[119] MINAM (2016). "Lucha por la legalidad en la actividad minera (2011-2016). Avances concretos y retos para enfrentar la problemática de la minería ilegal y lograr la formalización de los operadores mineros". Julio, 2016.
[120] Ísmodes, F. Presentación del Ministro de Energía y Minas a la Comisión de Energía y Minas del Congreso de la República. Agosto 2018.

may open new horizons for mining companies to access new resources. However, venturing into new frontier areas is uncharted territory in terms of governance and geopolitics.

Mining companies are likely to face growing geopolitical instability associated with resurgent resource nationalism. Mineral producing countries are becoming increasingly focused on how they can use minerals to leverage national development rather than on supplying them to the global market. Resource nationalism has also found expression in the imposition of tougher investment provisions associated with more costly conditions on mining investors. Resource nationalism and labour unrest remain key issues in developing mining jurisdictions, notably in African and Latin American countries. In consuming countries, this resource nationalism is manifest in the adoption of policies aimed at securing supplies or imposing import tariffs. This trend is likely to be exacerbated by market concentration in the rare earth, lithium, cobalt and other 'critical minerals' sectors, which are central to high-tech and renewable energy industries.

Implications in Peru:

a) Increase and escalation of post-extractive stances and discourses

In Peru political discourses around post-extractive visions can be observed, along with demands for fairer distribution of the benefits from extractive activities, giving preference to communities or regions where these activities occur.

It is probable that in the short and medium term, these discourses will not develop into nation-wide "nationalist" political or social movements, but rather the groundswell of public opinion and associated social and political movements will remain contained at a local or regional level. These will be a function of the diverse geographical and social characteristics of each region. In recent years, relevant cases include Cajamarca, Junín, Puno or the recent movements in regions such as Apurímac, Arequipa and Moquegua.

Although these are issues that draw the attention of national debate for a limited time, they contribute to reinforcing stances and concerns around mining and its environmental and social impacts in national public opinion. They may turn into issues that lead to an assessment of national government's performance and capacity to prevent and resolve mining related conflict.

4. Concluding remarks

This report identifies the global trends that are most likely to affect the mining industry over the next decade and considers their implications for Peru. The report focused on a wide range of political, social, environmental, technological and economic trends. As stated at the beginning of this report, this work was conducted and completed prior to the outbreak of the global COVID-19 pandemic. Today, mining industry stakeholders are finding themselves in a position where they are working to assess the exposure to, and impact of, COVID-19 on their operations and supply chains. While each day may bring new challenges along the supply chain, it is also important to recognise and act on opportunities to improve social performance of mining operations, and to improve how the sector operates. For example, as COVID-19 plays out, mining companies may be in a position to demonstrate that the value they bring to governments and host communities extends well beyond the borders of the mine site.

Notwithstanding the specific implications for mining companies, governments and communities, the pandemic will have a significant effect on the health of the global and Peruvian economy, on supply and demand for minerals, and on how mining industry stakeholders operate. Implications

are likely to be wide-ranging and affect the whole of society in unforeseen ways.[121] Therefore, it is prudent to monitor the trends discussed in this report alongside ever changing global, regional and national developments.

[121] Nate Hagens (2020), An Overview of the Systemic Implications of the Coronavirus, 25 March, https://www.resilience.org/stories/2020-03-25/an-overview-of-the-systemic-implications-of-the-coronavirus/.

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