

Talent shortages and talent surpluses in the mining Industry in South America

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The mining industry in South America is currently experiencing its greatest increase in budget and development opportunities in recent years. However, it also faces a paradoxical situation of simultaneous human resources (HR) scarcity and HR surplus that prevents it from sustaining this growth. Although there are some first rate educational programs in earth sciences, the quality of the educational institutions is uneven and as a general rule, there is a breach between the educational supply from universities and the demand from the market. In this context, professional development is a top priority to maintain and increase competitiveness of the mining industry in the region.

Record investment budgets spearhead mining workforce demand

The mining industry in South America is receiving the highest inflow of investment in history. Additionally, it has significant growth opportunities with project portfolios and investment budgets of considerable size. Indeed, it has been estimated that the mining investment in Latin America during the next decade will reach US\$200 billion (Expomin Chile, 2011). Chile and Peru, for example, have exploration and development project portfolios with budgets of US\$55 and 42 billion, respectively (Cochilco, Chile; Ministerio de Energía y Minas, Perú).

In recent years, mining has become the most important industry in economic terms in Peru. As shown in Table 1, Peru has 380 active mining companies, most of them engaged in metallic mining. A top tier of over 25 operating companies is composed by global diversified multinationals, giant gold and copper companies, and international medium sized and large national companies. Equally important, more than 100 junior exploration companies, mainly in metallic mining, are very active. This rapid growth of the mining industry has led companies to compete for labor very aggressively and has created workforce bottlenecks.

Table 1. Type and number of mining companies in Peru where E = Exploration; P = Production and E&P = Exploration & Production. [Source: Ministry of Energy and Mines of Peru; March 2011.]

| Classification | Metallic mining | | | Non-metallic mining | | | Metallic & non-metallic mining | | | Total |
|------------------------|-----------------|-----|-----|---------------------|----|-----|--------------------------------|---|-----|-------|
| | P | E | E&P | p | E | E&P | P | E | E&P | |
| Large and medium sized | 42 | 58 | 15 | 26 | 7 | 1 | 2 | 1 | 4 | 156 |
| Small mining | 56 | 35 | 3 | 44 | 16 | 5 | 1 | 7 | 3 | 170 |
| Artisanal mining | 6 | 16 | 1 | 24 | 6 | 1 | 0 | 0 | 0 | 54 |
| Total | 104 | 109 | 19 | 94 | 29 | 7 | 3 | 8 | 7 | 380 |
| | 232 | | | 130 | | | 18 | | | |

Talent gaps in the mining industry

Mining companies need professionals, technicians and workers to execute their growth strategies. Workforce deficits expose the mining industry to significant potential threats such as losses in productivity, increases in recruiting and retention costs, restrictions to innovation, project delays, and other opportunity costs. Demand forecasts for human resources in the mining industry indicate that current shortages of professionals and technicians may worsen in the future and will constrain the growth of the industry if left unaddressed. Indeed, the Boston Consulting Group predicts that

labor demand in mining in countries including Brazil, Russia, India and China (BRIC countries) will grow at a compounded annual rate of growth of 3 per cent (CARG: compounded annual rate of growth) for the next 10 years. In the case of developing countries, the rate of growth will be even higher: 'In developing countries, mining has the strongest labour demand and the most need for talent in 2020 and beyond. 'The forecasts indicate that demand is even stronger in high level positions: 'The demand trend for high-skills positions – management, for instance – is expected to peak beyond 6 per cent compounded annual rate of growth in mining by 2020.'

GERENS has completed a study of the growth in the demand for professionals in the mining industry in Peru. As shown in Exhibit 2, the demand for mining engineers from mining companies ranges from 5.9 per cent in an optimistic scenario to 0.1 per cent in a pessimistic one. Blasting companies show the highest demand under the optimistic and most likely scenarios. Contractors, consulting companies, and equipment suppliers have the highest volatility, ranging from very high rates of demand in optimistic scenarios to significant decreases (layoffs) under pessimistic ones. The demand for mining engineers in the public sector has only upward mobility, growing at a 2.1 per cent under an optimistic scenario, but shows no decrease under a pessimistic scenario, reflecting that public officials do not lose employment during a crisis.

Table 2. Peru: rates of growth of demand for mining engineers by type of employer.

| Type of employer | Optimistic | Most likely | Pessimistic |
|----------------------|------------|-------------|-------------|
| Mining companies | 5.9 | 3.5 | 0.1 |
| Blasting companies | 7.7 | 4.7 | 0 |
| Contractors | 5.1 | 3.3 | -3.3 |
| Consulting companies | 3.2 | 2.2 | -1.0 |
| Equipment suppliers | 5.2 | 2.3 | -3.6 |
| Public sector | 2.1 | 0 | 0 |

Disparity between supply and demand

The mining industry in South America faces a paradoxical situation of simultaneous HR scarcity and HR surplus.

Scarcity

A recent survey among business executives from mining companies, contractors, suppliers, consultants, and other companies that hire mining and geology professionals, ascertained what percentage of graduates were considered fully employable upon graduation. These professionals were considered to have 'the skills required by the market' The survey found that, due to an uneven quality of universities, less than 10 per cent of graduates in mining, geology and metallurgy are *wisrebym*, that is, are considered fully employable upon graduation. Although there are internationally competitive schools in South America, the quality of the education is uneven and in the majority of them, it is still low.

Quality of education in mining, geology and metallurgy is a major issue for the South American mining industry. It is estimated that around 80 to 90 per cent of students have some level of competency gaps. It is interesting to note that, in addition to core functional competencies, the market is expecting managerial skills critical for the growth phase of the mining industry (such as project management, resource planning and community relations, and socio-environmental conflict management skills) from professionals in the mining, geology, and metallurgy fields.

Equally revealing, the market is expecting a broader set of behavioral skills, such as communication, leadership and emotional intelligence, and other critical skills related to globalisation and technology innovation, such as a command of the English language, cross-cultural training, and software for mining and geology applications. This problem is not only observed in South American educational systems; in fact, it is widespread in developing countries. In the case of India, for example, according to a *Harvard Business Review* article, only 25 per cent of Indian professionals are considered employable by multinationals.¹

Oversupply

On the other hand, there is intense activity in the supply side, generating a surplus of graduates. Indeed, in Peru, the number of new professionals in mining, geology and metallurgy graduating each year is two to three times the annual number of new hirings. Each year, a number of young professionals fail to find a job in their field and have to find a job elsewhere. The oversupply stems from a lack of planning and a significant growth in the number of educational institutions and student enrollment. This is in sharp contrast to the situation prevailing in other continents (North America, Europe) where the opposite is true: Earth Sciences schools are closing and student enrollment decreasing.

Avenues for solution

There are various options available to solve current and future talent surpluses and shortfalls in the mining industry in South America. These potential solutions require action by universities, governments and mining companies. Some solutions are required from the 'supply side' and some from the 'demand side'. Solutions on the supply side include workforce migration, improving university and vocational education, while solutions on the demand side include workforce planning and important programs of reskilling current professionals and technicians.

Revamping university systems

Most universities fail to adjust their curricula to incorporate the competencies and skills required by the industry. Mining and geology departments must undertake major initiatives to improve quality of education and eliminate the disparity between the skills needed by the corporations and the capabilities that graduates are developing. Curriculum and educational program designs should be revamped, research programs intensified, and efforts to attract high calibre faculty to mining schools increased. The aim should be to reinvent university curricula to include the new competencies and skills required by the mining industry.

Professional migration

As indicated above, paradoxically, some countries have an oversupply of talent while others have a gap. Analyses of labor market demand for professional mining engineers and geologists show that quality increase of the educational programs should be a top priority over the next decade. If quality revamping becomes successful, given the high and increasing enrollment in mining and geology schools, Peru, Chile and other South American countries could not only satisfy their internal demand for talent but become significant exporters of talent.

Facilitating professional migration could be part of the solution. Mining is a global industry and working in a foreign country is a natural step in professional development, especially at high-skills jobs, both professional and technical. Professional mobility across national boundaries in the South American mining industry is increasing. In Peru, for example, graduates from Universidad Católica, considered the top mining school in the country, face a 'sellers' market' and have many employment choices. Employers from Australia (ie BHP Billiton) hire these graduates, providing them attractive salaries and other incentives. Argentina has a big mining potential and insufficient HR development and Peruvian and Chilean professionals are being hired. Some countries such as Canada have policies for attracting foreign workers and facilitating their integration into the labor market with tools

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such as simplified immigration programs, incentives for immigration of skilled workers, and mechanisms to ease professional mobility within the country.

Upskilling and reskilling

As the mining industry adopts new technologies, demand for new skills increases significantly. Some skills become obsolete and employees with only those skills will no longer be needed. The solution is retraining and reskilling the workforce to perform the new jobs required by the industry. Both the companies and the government in the region should launch training for workers entering the workforce as well as more experienced workers to facilitate their advancement to more skilled jobs. There is an urgent need to invest in upskilling and retraining for both professional and technical employees, to help workers in their current jobs as well as in future jobs.

Strategic workforce planning

Workforce planning is the process to ensure that a country or a company has a balance between demand for future growth and access to talent to satisfy such a demand. Through the employment of workforce planning methodologies, talent gaps and talent surpluses can be adequately forecasted and corrected. Ideally, future talent gaps should be ascertained by job families and by critical skills.

Workforce planning at a macro level faces data constraints in South America. As a general rule, there is not enough data available about demand and supply of mining workforce (professionals, technicians, workers) on a nationwide scale. Given its importance, governments, trade unions and companies should engage in collaborative work in order to collect the data and conduct the required forecasts to guide decisive action. Taking action without that information is risky.

Conclusion

The growth of the mining industry in South America is already facing significant talent scarcity and experiencing, at the same time, a talent surplus. This occurs because, on the one hand, an overall increase in investment on the mining industry in South America has led to a fierce competition for labor between the companies. However, very few graduated professionals in the mining, geology, and metallurgy fields are considered employable by business executives from mining companies, because universities are not training their students with the skills that the current market demands.

At the same time, because the number of educational institutions and student enrolment keeps increasing, there is also an oversupply of graduated professionals who then fail to find employment with their current skills. These trends, if left unaddressed, will worsen in the future and put a constraint on the development of the mining industry in South America.

Universities, governments and mining companies need to take action. There are several avenues for solution available, such as workforce migration, by exporting talent to countries with high demand for professionals in the mining industry but insufficient HR development; the improvement of the quality of university education via the restructuring of curricula to cater to the market's new skill and competency requirements; and workforce planning and reskilling, particularly the training of employees to allow them to perform the new kinds of jobs that the mining industry demands.

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