Chilean attitudes toward mining

Citizen Survey – 2014 Results

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#csiromining
CSIRO Mineral Resources Flagship

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feedback
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Mining in Chile

The development of the mining sector over recent years has been integral to the rapid development of the Chilean economy\(^1\). Yet mining must also demonstrate that it has a ‘social licence to operate’ among those communities in the regions where it operates and within society more broadly. This report aims to bring the voice of the citizens of Chile, on whose behalf Chile’s mineral and energy resources are managed, into the centre of a conversation about the role of the mining industry in our society.

Mining is an important industry operating in a complex world

As the world’s leading producer of copper, Chile produced 34% of global copper in 2010\(^2\). Alongside copper, Chile is also an important producer of gold, silver, iron and lithium. The development of the mining sector over recent years has been integral to the rapid development of Chile’s economy. In 2012, the mining industry contributed 14.2% to Chile’s Gross Domestic Product (GDP), and 59.4% to Chile’s total exports, which equated to a total value of USD$46,537 million\(^3\).

According to the National Statistics Institute (INE), in 2012, the mining industry employed 3.3% of the total Chilean labour force of 7.6 million persons\(^4\). This equated to approximately 250,800 persons directly employed by the mining sector. In 2012, investment in the mining industry was particularly strong\(^5\). Further to this, the Chilean Center for Copper and Mining Studies (CESCO) has projected that investments totalling USD$327 billion will be made in the Latin American minerals industry over the period 2011 to 2020. Of this total, USD$75 billion is estimated for investment in the Chilean minerals industry\(^6\). However, it has also been recognised that given the current shortage of skilled professionals available in the mining industry in Chile, supporting this new investment and industry growth will require that some 20,000 to 44,000 operators, professionals and maintenance staff are recruited in the period to 2020. Already companies such as Anglo American, Antofagasta Minerals, BHP Billiton, Codelco, and Collahuasi have agreed to develop a joint training program with the aim of training up to 28,000 workers in mining-related trades by the end of 2015\(^7\).

Mining has a long history in Chile, which is reflected in the number of ghost towns associated with the many early-19th century ‘salitreras’ (nitrate operations) scattered across the Atacama desert. Throughout its history, mining has been strongly influenced by political concerns in Chile, with the nation’s copper resources nationalised progressively from the 1950s through to the 1970s. This nationalization allowed the formation and growth of the Corporacion Nacional del Cobre (CODELCO), a state-owned company that in 2013 was still the largest refined-copper producer in the world\(^8\). However, during the last three decades foreign investment has increased in the Chilean mining industry, with a large number of multinational companies now operating across the country.

As outlined in CSIRO’s ‘The Future of Mining in Chile’ report (2014)\(^9\), there are a number of significant current and future challenges for the mining industry in Chile. These include access to affordable energy, water and human capital. A significant amount of Chile’s mining activity is located in the north of the country, a region that is extremely arid and remote. While this activity is distant from most large population centres, mining activity has been challenged by inter-industry competition for natural resources, inequity within local communities regarding the benefits of mining, and community concerns about the environmental impacts of mining locally and nationally. With respect to water use, for instance, the mining industry has responded by seeking to deploy highly efficient water management and reuse technologies and protocols in operations, including significant desalination plants to supply water to existing and new operations.

For the citizens of Chile, the benefits and impacts of the mining industry are mixed. Mining has generated significant economic benefits for the country, although these benefits are often concentrated in large urban centres such as Antofagasta and Santiago. At a more local scale, GDP per capita is around 163% higher, and the average salary 63% higher, in mining regions than non-mining regions, while poverty levels are 24% lower in mining regions. However, mining regions experience lower education levels and per-capita expenditure on health is 14% lower compared to non-mining regions. Housing, drug use and higher levels of imprisonment are also issues of concern in mining regions\(^10\). This uneven distribution of impacts and benefits as a result of mining, as well as issues around water and energy use, have led to significant social conflicts at different times in Chile, often concentrated within local communities at major mining operations.

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1 In this research, mining and the mining industry includes: coal mining, oil and gas extraction, metal ore mining, non-metallic mineral mining and quarrying, exploration and other mining support services (i.e. mineral exploration).
5 (CIE Chile, 2013: 15)
7 (CESCO, 2012)
These issues all play out within a context where environmental impact and sustainability has become much more important for the mining industry in Chile over the last two decades. The 1994 Environmental Framework Law, the establishment of the Environmental Impact Assessment System in 1997, and the imposition of significant fines on mining companies by the newly established Ministry of Environment, signal that mining in Chile must be conducted to the highest environmental standards. The gap between this expectation and the reality experienced by Chile’s citizens living near mining operations has also fuelled local community discontent and conflict\(^{12}\).

**Understanding the mining industry’s social licence to operate**

While mining has clearly been a central pillar in the development of Chile’s economy, and this has been supported by a legal framework which has ensured stability and security of investment, understanding the impact of the industry in terms of human development and well-being has been less straightforward\(^{13}\). In this regard, the mining industry also occupies a central position in political and social discourse in Chile, reflecting a more complicated relationship between the industry, government and civil society.

The relationship between mining and society is not an easy one. CSIRO is keen to understand more about what the citizens of Chile think about mining. Importantly, we want to understand how the impacts and benefits of mining, and the relationship between the mining industry, government and society, affects the level of acceptance of mining among Chile’s citizens – we want to understand what constitutes a social licence to operate for mining in Chile.

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Introduction

This report summarises the key findings from a survey of 1,598 Chilean citizens about their attitudes toward the mining industry. This project was funded by Australia’s Commonwealth Scientific and Industrial Research Organisation (CSIRO) and is part of a larger program of work to understand and articulate the views of citizens in mining jurisdictions around the world. To date, national scale surveys have also been conducted in Australia and China, and a pilot survey completed in Zambia.

Following an environmental scan, literature review and discussion with local CSIRO personnel, a quantitative survey of 1,598 citizens was conducted in late 2013 using a household survey methodology. Data was collected from four geographic zones within Chile: Northern Zone (including Regions I, II, III, IV and XV); Central Zone (including Regions V, VI and VII); Southern Zone (including Regions VIII, IX, X, XI and XIV), and; Metropolitan Zone (Santiago). These zones were chosen as they allowed for a comparison of perspectives from citizens living in mining regions, non-mining regions and urban or metropolitan contexts. Table 1 details the number of participants in each zone sampled and how many participants in each zone lived in mining and non-mining areas.

Participants were recruited face to face by Feedback Communications, a specialist data collection company in Chile, and the survey was completed by participants in their home by interviewers. This data was collated, cleaned and provided by Feedback Communications to CSIRO for analysis. We used a broad definition of mining in this study, which included: coal mining, oil and gas extraction, metal ore mining, non-metallic mineral mining and quarrying, exploration and other mining support services (i.e. mineral exploration).

Table 1 Participants categorised by zone and whether they were located in a mining area or not.

<table>
<thead>
<tr>
<th>ZONE</th>
<th>MINING VS NON-MINING AREAS</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MINING</td>
<td>NON-MINING</td>
</tr>
<tr>
<td>Northern</td>
<td>398</td>
<td>0</td>
</tr>
<tr>
<td>Central</td>
<td>310</td>
<td>90</td>
</tr>
<tr>
<td>Southern</td>
<td>0</td>
<td>400</td>
</tr>
<tr>
<td>Metropolitan</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>708</td>
<td>490</td>
</tr>
</tbody>
</table>

SURVEY PARTICIPANTS

<table>
<thead>
<tr>
<th>EDUCATION</th>
<th>EMPLOYMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did not complete year 12</td>
<td>Employed Full-time</td>
</tr>
<tr>
<td>Completed year 12</td>
<td>Employed Part-time</td>
</tr>
<tr>
<td>Postsecondary qualification</td>
<td>Homemaker</td>
</tr>
<tr>
<td>Undergraduate degree</td>
<td>Retired</td>
</tr>
<tr>
<td>Postgraduate</td>
<td>Student</td>
</tr>
<tr>
<td></td>
<td>Unemployed</td>
</tr>
</tbody>
</table>

SELF-REPORTED KNOWLEDGE OF THE MINING INDUSTRY

AGE GROUP

0% 5% 10% 15% 20% 25% 30% 35% 40%

18-29 30-39 40-49 50-59 60+

FEMALE  MALE

Did not complete year 12
Completed year 12
Postsecondary qualification
Undergraduate degree
Postgraduate

Employed Full-time
Employed Part-time
Homemaker
Retired
Student
Unemployed
What does mining mean to Chileans?

To understand how Chileans view mining in the broader national context, we asked participants to rate their level of agreement with a number of statements about mining in Chile on a scale of 1 (strongly disagree) to 7 (strongly agree).

Mining is a central and necessary economic pillar for Chile

Overall, mining was viewed as a central and necessary economic pillar for Chile (Table 2). Comparing the responses of those living in different parts of the country, we found that participants living in the metropolitan region felt this significantly more strongly than those in mining and non-mining regions14.

We also asked participants about the level of employment derived from mining in Chile, as well as the proportion of Chile’s GDP that they believed was contributed by mining. Citizens surveyed in mining regions believed that 45.75% of Chile’s workforce was employed by mining while those in non-mining regions believed this figure to be 30.94% and those in the metropolitan region around 28.87%. This is in contrast to the official employment figures which state that 3.3% of Chileans work in the mining sector. Similarly, those in mining regions indicated their belief that mining contributes around 54% of the country’s GDP, a figure that dropped only slightly (51%) among those in the metropolitan region, but which was significantly higher to those in non-mining regions (48%). The perceived contribution to GDP is far above the official report of 14.2% in 201215 suggesting that mining is seen to be strongly connected to Chile’s economic position.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>MEAN AGREEMENT (STANDARD DEVIATION)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mining is central to Chile</td>
<td>6.19 (SD = 1.29)</td>
</tr>
<tr>
<td>Mining is not necessary for Chile</td>
<td>2.37 (SD = 2.08)</td>
</tr>
<tr>
<td>Mining contributes to the standard of living in Chile</td>
<td>5.92 (SD = 1.43)</td>
</tr>
<tr>
<td>Mining will support Chile’s future prosperity</td>
<td>5.88 (SD = 1.45)</td>
</tr>
<tr>
<td>Mining contributes significantly to Chile’s economy</td>
<td>6.18 (SD = 1.24)</td>
</tr>
</tbody>
</table>

Table 2 Mean ratings of the macro relationship between mining and Chile overall and for each region sampled.

Rated on a scale from 1 (not at all) to 7 (very much so).

14 Only statistically significant results are reported as differences in this report. Predominately these differences were calculated using an Analysis of Variance (ANOVA) test, and are significant at the p<.05 level.

15 (CIE Chile, 2013)
Is Chile too dependent on mining?
While Chileans felt mining was important for Chile, they were also concerned that Chile may be too dependent on the industry. As shown in Figure 1, responses overall indicated that perceptions that Chile was too dependent on mining were above the midpoint of the scale used. For those in non-mining regions this concern was significantly lower than for those in mining and the metropolitan area. Interestingly, Chileans overall were much less concerned that their community was too dependent on mining, although for those in mining regions there was a much stronger perception of dependence at a community level.

To what extent do Chileans accept mining?
We asked participants to respond to the statement, ‘which of the following options best describes your position to mining?’ On a scale from 1 (reject mining) to 5 (embrace mining), responses from those in mining, non-mining and the metropolitan region were consistent and positive (Figure 2). Overall, the mean response to this item was 3.51 (SD = 1.12), which is above the midpoint of the scale used (3), indicating a positive response.

What do Chileans think about foreign ownership of mining companies?
The statement “There should be restrictions to foreign ownership of Chilean mining operations”, received quite a high level of agreement, with an overall mean rating of 6.23 (SD = 1.41). Participants in the metropolitan region (M = 6.40 SD = 1.49) agreed significantly more strongly than participants in mining regions (M = 6.12 SD = 1.37). Responses to the statement “Chilean mining resources should be exploited by Chilean companies” received an even stronger level of agreement (M = 6.50 SD = 1.07), with participants in the metropolitan region again significantly more agreeable than those in mining regions. This level of feeling likely relates to the history of the state owned Codelco in Chile’s mining landscape, and the sense of national ownership in this institution.

Despite this strong sentiment, there was quite a strong level of agreement with the statement “Foreign companies bring necessary know-how and resources to the Chilean mining industry” with an overall mean of 5.49 (SD = 1.61). In this instance however, non-mining regions (M = 5.65 SD = 1.52) were significantly more agreeable than those in mining regions (M = 5.36 SD = 1.61).
The benefits of mining

To examine the positive benefits that mining creates, we asked participants to rate the importance of a range of benefits that may come from mining for the country, regional communities and areas, and individuals. These included employment, improvements to regional infrastructure as a result of mining, and general economic benefits. In general, those living in mining areas perceived the benefits from mining much more positively than those in non-mining and the metropolitan area.

Job creation

The creation of jobs by the mining industry for Chileans was the most important perceived benefit for the country (see Table 3). This was largely consistent across mining, non-mining and the metropolitan area. Employment opportunities for women were also positive, though significantly more so in mining regions than in non-mining and the metropolitan region. Similarly, the contribution mining makes to the development of young Chileans, was also seen more positively by those in mining regions than those in non-mining and metropolitan regions.

Table 3 Mean ratings of the perceived benefits of mining overall and for each region sampled.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>MEAN AGREEMENT (STANDARD DEVIATION)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OVERALL</td>
</tr>
<tr>
<td>Mining creates jobs for Chileans</td>
<td>6.25</td>
</tr>
<tr>
<td>(SD = 1.16)</td>
<td>(SD = 1.16)</td>
</tr>
<tr>
<td>Mining provides employment opportunities for women</td>
<td>4.95</td>
</tr>
<tr>
<td>(SD = 1.87)</td>
<td>(SD = 1.63)</td>
</tr>
<tr>
<td>The mining industry makes an important contribution to the development of young Chileans</td>
<td>4.92</td>
</tr>
<tr>
<td>(SD = 1.82)</td>
<td>(SD = 1.69)</td>
</tr>
<tr>
<td>Mining has helped improve transport infrastructure such as road and ports in Chile</td>
<td>4.92</td>
</tr>
<tr>
<td>(SD = 1.98)</td>
<td>(SD = 1.87)</td>
</tr>
<tr>
<td>The average Chilean is wealthier because of mining</td>
<td>4.84</td>
</tr>
<tr>
<td>(SD = 1.90)</td>
<td>(SD = 1.60)</td>
</tr>
<tr>
<td>Mining has positive effects on regional communities in Chile</td>
<td>4.75</td>
</tr>
<tr>
<td>(SD = 1.88)</td>
<td>(SD = 1.76)</td>
</tr>
<tr>
<td>Mining has improved social infrastructure in Chile</td>
<td>4.43</td>
</tr>
<tr>
<td>(SD = 2.01)</td>
<td>(SD = 1.83)</td>
</tr>
<tr>
<td>Mining has positive effects on Indigenous communities in Chile</td>
<td>3.77</td>
</tr>
<tr>
<td>(SD = 2.10)</td>
<td>(SD = 2.00)</td>
</tr>
<tr>
<td>Poverty has been reduced in my area as a consequence of mining activity</td>
<td>3.07</td>
</tr>
<tr>
<td>(SD = 2.12)</td>
<td>(SD = 2.04)</td>
</tr>
<tr>
<td>My family has benefited from mining</td>
<td>2.77</td>
</tr>
<tr>
<td>(SD = 2.22)</td>
<td>(SD = 2.36)</td>
</tr>
</tbody>
</table>

Rated on a scale from 1 (not at all) to 7 (very much so).
Improved infrastructure and positive effects on regional communities

Participants from all regions equally believed that mining has positive impacts on regional communities. Participants from mining and non-mining regions rated the development of transport infrastructure and benefits for Indigenous communities significantly more positively than those in the metropolitan area. Participants in mining regions also perceived greater social infrastructure benefits in regional Chile than participants in both non-mining and the metropolitan regions (see Table 3).

Increased wealth

Participants believed that the average Chilean is wealthier because of mining. Looking across the items, however, important distinctions are evident between those from mining and non-mining and the metropolitan region regarding benefits. Those living in mining areas perceived much stronger general wealth, family benefits, and poverty reduction as a result of mining than those from non-mining and the metropolitan area, although apart from general wealth, ratings of these benefits are only moderate.
The negative impacts of mining

To examine the negative impacts of mining, we asked participants to respond to a range of issues including the environment, other industry sectors, cost of living, and the health of communities surrounding mining operations. In general, the negative impacts of mining were rated significantly more strongly by those living in mining regions, followed by those in non-mining regions, and then respondents in the metropolitan area.

**PERCEIVED NEGATIVES**

- Water quality / environment
- Agriculture sector
- Health of local communities

**IS IT WORTH IT?**

Considering the benefits and costs associated with mining, it is worthwhile to pursue mining in Chile

**Water quality and environment**

Overall, statements regarding the negative impact of mining on the environment received the strongest responses from participants. This included perceptions of impacts on water quality (both groundwater and surface water), the environment in general, and mining’s contribution to climate change (see Table 4). In relation to mining’s impacts on water quality and environment, participants from both mining and non-mining regions indicated a strong perception that mining had negative impacts on water quality and environment, while participants from mining regions reported a higher level of perceived impacts on the environment compared to those from non-mining regions.

**Health and well-being of local communities**

Examining the negative health impacts of mining, the pattern of responding again reflected the level of exposure participants had with mining. Those in mining regions reported significantly higher negative impacts on the health of local communities and cost of living as a result of mining than those in non-mining regions. Also, people in mining regions felt that levels of sexually transmitted diseases within mine workers and mining communities had increased as a result of mining to a greater extent than those participants in other parts of the country.

**Impact on agriculture**

Examining the perceived impacts of mining on the agriculture sector, participants from mining regions perceived stronger negative impact on the agriculture sector compared to those from non-mining regions.

**What do Chileans think of artisanal and small-scale mining?**

When asked specifically about artisanal and small-scale mining (ASM), participants in mining and the metropolitan region held significantly different perspectives than those in non-mining regions. When asked to rate their level of agreement with statements regarding ASM on a scale from 1 (not at all) to 7 (very much so), participants in mining (M = 4.92 and SD = 1.86) and the metropolitan region (M = 4.89 and SD = 1.97) perceived greater negative effects on the environment from ASM than those in non-mining regions (M = 4.51 SD = 1.94). Despite perceptions regarding environmental impacts, participants did not regard small-scale mining as a problem in Chile (M = 3.20 SD = 2.03). Rather, participants across all regions quite strongly believed that it was important to protect small-scale mining in Chile (M = 5.85 SD = 1.33).
Table 4 Mean ratings of the negative impacts of mining overall and for each region sampled.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>MEAN AGREEMENT (STANDARD DEVIATION)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OVERALL</td>
</tr>
<tr>
<td>Mining impacts negatively on water quality</td>
<td>5.71 (SD = 1.73)</td>
</tr>
<tr>
<td>Mining has negative impacts on the environment</td>
<td>5.67 (SD = 1.76)</td>
</tr>
<tr>
<td>Mining has negative impacts on the health of local communities</td>
<td>5.16 (SD = 1.91)</td>
</tr>
<tr>
<td>Mining contributes to climate change</td>
<td>4.88 (SD = 2.10)</td>
</tr>
<tr>
<td>Mining has a negative impact on agriculture</td>
<td>4.74 (SD = 2.17)</td>
</tr>
<tr>
<td>Mining leads to increased levels of diseases like HIV / AIDS among mine workers</td>
<td>4.51 (SD = 2.13)</td>
</tr>
<tr>
<td>Mining leads to increased levels of diseases like HIV / AIDS in local communities</td>
<td>4.44 (SD = 2.16)</td>
</tr>
<tr>
<td>The cost of living, excluding housing, has increased in my area because of mining</td>
<td>3.45 (SD = 2.49)</td>
</tr>
<tr>
<td>Housing is more expensive in my area because of mining</td>
<td>3.38 (SD = 2.52)</td>
</tr>
</tbody>
</table>

Rated on a scale from 1 (not at all) to 7 (very much so).
Fairness, faith in governance and trust

We were also interested to understand the extent to which participants believed that the impacts and benefits of mining are distributed fairly, and the extent to which they felt they could influence how decisions about mining are made. In addition, we examined how perceived institutional governance, public efficacy, procedural fairness, and trust in the mining industry, national government, regional government, and Non Government Organisations (NGOs) affected acceptance of mining.

Distributional fairness

We asked respondents to rate the extent to which they believed the benefits associated with mining were distributed fairly. Generally speaking, participants from mining, non-mining and the metropolitan region perceived that the benefits from mining were not distributed fairly (see Figure 3). Moreover, participants from mining regions more strongly believed that incomes were less equitable in their area as a consequence of mining.

We also asked participants the extent to which they believe Chile as a nation receives its fair share of tax from the mining industry. Responses were below the midpoint of the scale used (M = 3.47 SD = 2.07), and there was no difference between mining, non-mining or the metropolitan area.

Procedural fairness

Procedural fairness in the present research refers to whether individuals perceive that they have a reasonable voice in decision-making processes\(^{16,17}\). Therefore, the more people feel that they can participate in decision-making processes about mining and feel respected by important decision makers (e.g., governments and the extractive industries), the fairer they will regard procedures relating to mining in Chile.

![Distributional fairness of benefits](image_url)

Figure 3 Mean levels of perceived distributional fairness of benefits from mining overall, and by region.

---


We asked participants to rate the extent to which people in Chile have opportunities to participate in decisions about mining on a scale from 1 (not at all) to 7 (very much so). Looking at the ability of Chileans to participate in decision making processes regarding development, scores were quite low (see Table 5). This finding suggests that Chileans felt they had limited opportunities to influence mineral development and that key industry actors did not have great regard for community opinions.

We also asked participants to rate the extent to which the mining industry, regional and national governments listen to and respect community opinions. When asked about the extent to which Chileans could influence the mining industry, scores were higher. In contrast, participants surveyed had less faith in their formal governance institutions to hold the mining industry to account (M = 2.45 overall, on a scale from 1 = ‘not at all’ to 5 = ‘very much so’) although they felt government listened to Chileans and respected them more than the mining industry does (see Figure 4). On these measures, participants in the metropolitan area felt government and the mining industry listened to them and respected them significantly less than those in mining regions.

Table 5 Mean ratings of procedural fairness and public efficacy overall and for each region sampled.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>MEAN AGREEMENT (STANDARD DEVIATION)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OVERALL</td>
</tr>
<tr>
<td>Chileans can participate in decisions about mining</td>
<td>3.27 (SD = 2.22)</td>
</tr>
<tr>
<td>Chileans can ensure the mining industry does the right thing</td>
<td>4.52 (SD = 1.99)</td>
</tr>
<tr>
<td>The mining industry listens to and respects community opinion</td>
<td>3.00 (SD = 1.97)</td>
</tr>
<tr>
<td>Regional governments listen to and respect community opinion</td>
<td>3.27 (SD = 1.92)</td>
</tr>
</tbody>
</table>

Rated on a scale from 1 (not at all) to 7 (very much so).

Figure 4 The extent to which the mining industry and regional governments listen to and respect the opinions of Chileans overall and per region.
Ensuring the mining industry does the ‘right thing’

Feeling heard and respected is fundamental to a sense of procedural fairness. But whom or what can actually influence the way mining takes place? We asked participants to rate the extent to which they believe legislation and regulation, regional and national governments, and courts and the judicial system can hold the mining industry to account. In all of these areas, responses overall were well below the mid-point of the scale (M = 2.45/2.45/2.42 SD = 1.17/1.19/1.22 respectively), indicating a lack of faith that formal institutions are sufficiently able to influence the way mining takes place (see Table 6). Participants in the metropolitan region held significantly less faith than those in mining and non-mining regions in the ability of regional and national governments to hold the mining industry accountable. On the other hand however, participants had quite a strong level of faith that the Chilean public can successfully defend its national interests together.

Mining communities and the Chilean public more generally, also feel they have the ability to influence the way mining takes place, either directly influencing mining companies or through influencing government policy. Responses overall to items examining citizen agency (Table 7) were all above the midpoint scale with respect to levels of agreement. This level of agreement was consistent regardless of whether a participant was from a mining, non-mining or the metropolitan region. Finally, there was very strong sentiment regarding the need to gain the consent of local communities and Indigenous communities before mining development takes place. Participants in the metropolitan region felt significantly stronger about obtaining consent of Indigenous communities prior to mining development than those from non-mining regions.

Moreover, when we asked participants the extent to which they agreed that the mining industry was socially responsible, responses were around the mid-point, but tending quite positively (M = 4.45 SD = 1.92) and consistent across mining, non-mining and the metropolitan area. However participant responses were below the midpoint of the scale regarding the extent to which they believe the mining industry is prepared to change its practices in response to community concerns (M = 3.26 SD = 1.97), with those in the metropolitan area (M = 3.02 SD = 1.96) significantly less positive on this measure than those in mining (M = 3.32 SD = 1.87) and non-mining (M = 3.36 SD = 2.10) areas.

Table 6 Mean ratings of governance capacity, overall and for each region sampled.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>MEAN AGREEMENT (STANDARD DEVIATION)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OVERALL</td>
</tr>
<tr>
<td>Regional and national governments are able to hold the mining industry accountable</td>
<td>2.45 (SD = 1.19)</td>
</tr>
<tr>
<td>Legislation and regulation can be counted on to ensure mining companies do the right thing</td>
<td>2.45 (SD = 1.17)</td>
</tr>
<tr>
<td>The courts and judicial system can ensure that mining companies do the right thing</td>
<td>2.42 (SD = 1.22)</td>
</tr>
</tbody>
</table>

Table 7 Ratings of public efficacy and need for consent, overall and for each area.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>MEAN AGREEMENT (STANDARD DEVIATION)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OVERALL</td>
</tr>
<tr>
<td>The Chilean public can successfully defend its national interests together</td>
<td>5.26 (SD = 1.83)</td>
</tr>
<tr>
<td>The Chilean public is able to influence governments mining related policy</td>
<td>4.57 (SD = 1.93)</td>
</tr>
<tr>
<td>The Chilean public are capable of ensuring the mining industry do the right things for the country</td>
<td>4.52 (SD = 1.99)</td>
</tr>
<tr>
<td>I think mining communities can successfully defend its local interests together</td>
<td>4.93 (SD = 1.91)</td>
</tr>
<tr>
<td>I think mining communities are able to influence governments mining related policies</td>
<td>4.53 (SD = 1.94)</td>
</tr>
<tr>
<td>I think mining communities are can ensure the mining industry do the right things for local communities</td>
<td>4.38 (SD = 1.97)</td>
</tr>
<tr>
<td>It is necessary to gain the consent of Indigenous communities before mining development takes place</td>
<td>5.99 (SD = 1.61)</td>
</tr>
<tr>
<td>It is necessary to gain the consent of local communities before mining development takes place</td>
<td>6.17 (SD = 1.42)</td>
</tr>
</tbody>
</table>

Rated on a scale from 1 (not at all) to 5 (very much so).
Trust

We asked participants to rate their level of trust in a range of important actors in the mining industry in Chile: the mining industry, regional government, national government, and NGOs. We averaged responses to three items assessing trust in each of these actors: the extent each was trusted to act in the best interests of society, act responsibly, and do what is right. Looking at trust in key sector actors, Figure 6 indicates that trust is low across all of the actors examined, with little difference in responses from those living in mining regions and those living in non-mining regions. Almost identical patterns were observed for responses to items regarding trust in industry actors to ‘act responsibly’, ‘act in the best interest of society’, and ‘do what is right’. The metropolitan region was significantly less trusting of the mining industry and regional governments than those from mining and non-mining regions, but all regions held similar levels of trust in NGOs.

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Chilean attitudes toward mining

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Figure 5 Mean ratings of governance capacity

Figure 6 The level of reported trust in the mining industry, national and regional governments and NGOs overall and mining and non-mining regions (1 = not at all, 5 = very much so).
Going a little deeper… what leads to acceptance of mining?

Mining is a complex and important part of life in Chile, and the survey results in the previous sections provide a strong foundation for understanding this complexity a little better. However, if the mining industry is to be sustainable in Chile, it is important that we understand what underpins its ‘social licence to operate’, or its acceptance within society.

We explored this question in the national survey data in two ways. First, we explored how the impacts and benefits that are perceived to flow from mining affect Chileans’ level of acceptance of the industry. Second, we explored the role of Chile’s governance systems, and behaviour of the mining industry, in building trust and acceptance with the Chilean community.

How do the benefits and impacts of mining affect acceptance?

Using multiple regression analysis\(^{18}\), we examined how Chileans’ perceptions of the impacts and benefits of mining relate to acceptance of mining. We included items that reflect the key benefit and impact areas described earlier in this analysis, respectively:

- Economic benefits for the average Chilean (one item), economic benefits for my family (one item), regional infrastructure benefits (two items), employment and community benefits (three items);
- Impacts on living costs (two items), the agriculture industry (one item), and the environment (three items)

The strongest positive predictor of acceptance of mining was employment and community benefits (including for Indigenous peoples), followed by regional infrastructure development, and then economic benefits for average Chileans. This means that the more participants felt that mining created benefits in these areas (particularly employment and regional infrastructure), the greater their acceptance of mining as an industry.

The strongest negative predictor of acceptance of mining was impact on the environment followed by impacts on the agriculture sector. Impacts on the cost of living was not a significant predictor of acceptance of mining. This means that the more impacts that participants felt that mining had on the environment and agriculture, the less they accepted mining in Chile. While cost of living was an area where participants felt mining had a negative impact, this factor was not related to their level of acceptance.

Figure 7 Stylised regression model of benefits and impacts predicting acceptance of mining.

\(^{18}\) A brief overview of multiple regression (MR) analysis may be found at the following link: [http://www.uta.edu/faculty/sawasthi/Statistics/stmulreg.html](http://www.uta.edu/faculty/sawasthi/Statistics/stmulreg.html)
The importance of strong governance

In Chile, governments are always trying to find a balance between supporting the growth of mining development and managing the interests and concerns of citizens around this development. There are competing demands on governments to facilitate the economic benefits of new mining development through reducing the regulatory burden placed on it and to ensure that the community maintains faith in these governance institutions that protect their interests.

We were interested to explore this issue in this survey data through examining the way in which perceptions of governance capacity and environmental impact interact to predict acceptance of mining. We chose to examine environmental impact in this analysis as it represents the area where Chilean citizens felt mining had the largest impact and was the strongest negative predictor of industry acceptance. The relationship we found is represented in Figure 8, below.

The highest level of acceptance was found among those Chileans that felt mining had a low impact on the environment and had strong faith that the country’s governments and legislation/regulation can ensure mining companies do the right thing (i.e., governance capacity). The opposite was also true, the lowest levels of acceptance of mining were among those people that felt mining had a high impact on the environment and had low faith in Chile’s governance capacity.

![Figure 8 Relationship between perceived governance capacity, environmental impact and acceptance of mining.](image)

Based on these findings, there is a risk that streamlining government approvals processes for mining developments may be perceived by the public as reducing the capacity of governments to hold the mining industry to account against its environmental impact commitments and conditions. Paradoxically, reducing ‘green tape’ may make it easier to get a mine approved and operating but may simultaneously erode public confidence in legislative and regulatory power, reduce the acceptance of mining more broadly, and make it harder to operate a mine efficiently under conditions of increased social conflict. Recent research suggests that the number one cause of company-community conflict around mining operations are related to environmental impacts, lending support to this potential risk. These results also suggest that strengthening public perceptions that the governance capacity in Chile is high and able to ensure mining is conducted to high environmental standards will increase the level of acceptance of mining among citizens.

Social licence is everyone’s business

While impacts and benefits of mining are important in shaping citizen levels of acceptance of mining, achieving a social licence is also about building trust between companies, governments and society. There is a growing understanding that the way people are treated in decision making processes, the way that benefits are distributed from mining, and the role of governance in setting the rules of mining, are important to developing this trust and acceptance.

We explored this in our data by examining the role of the following measures in predicting trust in industry, and acceptance of the industry, in Chile:

- **procedural fairness** – the extent to which the industry listens to and respects community opinions, and changes its practices in response to community concerns;
- **distributive fairness** – the extent to which economic benefits from mining are distributed fairly, and each citizen receives a fair share of the benefits of mining;
- **governance capacity** – the extent to which Chileans feel that their regional and national governments, and legislation/regulation, can ensure mining companies do the right thing.

To do this, we used path analysis, a sophisticated statistical modelling technique that allows us to examine the relationships between these measures simultaneously. The results of this analysis can be seen in Figure 9: higher numbers indicate stronger relationships, and all of the relationships are positive which means, for example, that higher levels of trust lead to higher levels of acceptance.

The results show that:

- trust in the industry is a strong predictor of acceptance of industry, or put another way, the industry’s social licence is facilitated by the level of trust that the Chilean public have in it
- the more faith that people have in Chile’s governance capacity to ensure mining companies do the right thing, the more they trust the industry – this was the strongest predictor of trust in this model
- governance capacity was also a strong direct predictor of acceptance of mining
- procedural fairness in the way that industry engages the public leads to higher levels of trust in the industry
- the more that Chileans feel the benefits of mining are distributed fairly, the higher their level of trust in the industry
- procedural and distributive fairness, and governance capacity are all strongly positively related to each other – more of one leads to more of the others


20 A brief overview of path analysis may be found at the following link: http://en.wikipedia.org/wiki/Path_analysis_%28statistics%29
The results show that lead to higher levels of acceptance. Positive which means, for example, that higher levels of trust indicate stronger relationships, and all of the relationships are results of this analysis can be seen in Figure 9: higher numbers – the extent to which economic benefits are shared equitably, and when the legislative and regulatory frameworks we have in place provide confidence that industry will do the right thing.

To do this, we used path analysis. These results also suggest that strengthening distributional fairness, procedural fairness, and governance capacity were being represented strongly by governments, legislation and regulation, they felt more positive about the industry in general. The direct path between governance and acceptance demonstrates the power of this factor in the industry's social licence to operate independent of any other variable.

From this data, we can see that the Chilean public are more accepting of the mining industry in Chile when industry and government work together to support trust in the industry – holding a social licence to operate is therefore the responsibility of governments and industry working together with communities to promote effective, constructive, and mutually beneficial relationships.

Governance capacity in particular appears to be very important in Chile for building trust and acceptance of the mining industry. In this data, when citizens felt that their interests were being represented strongly by governments, legislation and regulation, they felt more positive about the industry in general. The direct path between governance and acceptance demonstrates the power of this factor in the industry's social licence to operate independent of any other variable.

Together then, these results show that to build trust and acceptance of industry (i.e., a social licence) requires more than just the actions of either industry or governments alone – a social licence is dependent on these important parts of the mining industry working together. Chileans trust and accept the industry more when they feel heard by the industry, when it is responsive to their concerns, when benefits from mining are shared equitably, and when the legislative and regulatory frameworks we have in place provide confidence that industry will do the right thing.

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Have your say – get social

We want you to have your say on the big issues around mining. Tell us what you think the data means, tell us what we should do next, be part of a national conversation about mining in Chile.

Go to Twitter and use the #csiromining to comment

Go to CSIRO’s Facebook site to leave a message
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