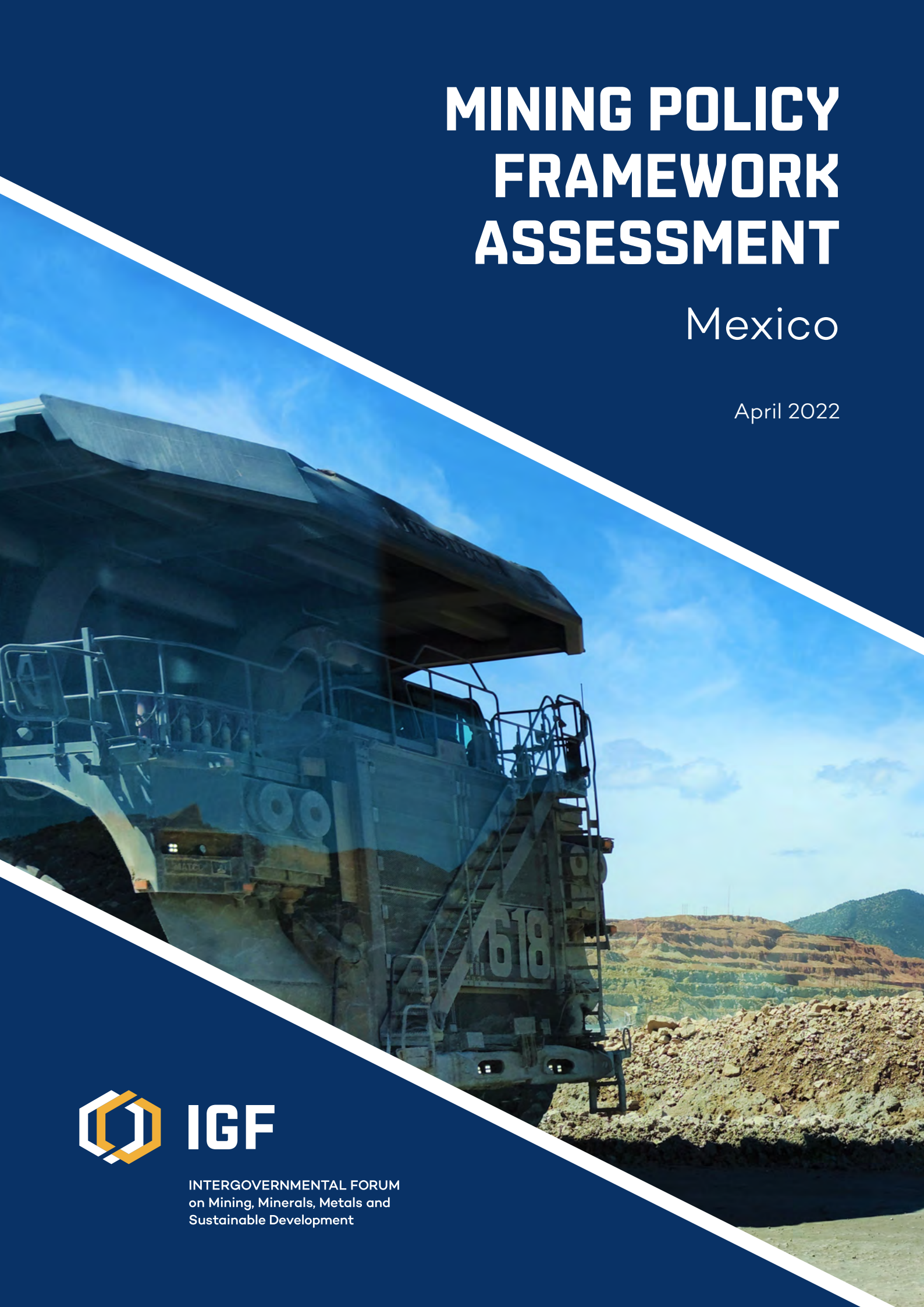
MINING POLICY FRAMEWORK ASSESSMENT

Mexico

April 2022



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The Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development (IGF) supports more than 75 nations committed to leveraging mining for sustainable development to ensure negative impacts are limited and financial benefits are shared. It is devoted to optimizing the benefits of mining to achieve poverty reduction, inclusive growth, social development and environmental stewardship.

The IGF is focused on improving resource governance and decision making by governments working in the sector. It provides a number of services to members including: in-country assessments; capacity-building and individualized technical assistance; guidance documents and conferences which explore best practices and provide an opportunity to engage with industry and civil society.

The International Institute for Sustainable Development has served as Secretariat for the IGF since October 2015. Core funding is provided by the governments of Canada and the Netherlands.

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Mining Policy Framework Assessment: Mexico

April 2022

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About the Mining Policy Framework Assessment Reports

With support from the Government of Canada, the Intergovernmental Forum on Mining, Minerals, Metals, and Sustainable Development (IGF) is working with a selection of voluntary member states to help them operationalize practices consistent with the IGF's Mining Policy Framework (MPF). The first assessments were conducted in 2014 in the Dominican Republic, Madagascar, and Uganda. Based on the success of these initial evaluations, the IGF will conduct three or four assessments each year, in response to member requests.

The MPF assessment process comprises two main steps. First, the MPF assessment team evaluates relevant national, regional, and international laws, policies, conventions, and administrative frameworks for the development and management of mining and minerals in relation to the six themes of the MPF: Legal and Policy Environment, Financial Benefit Optimization, Socio-economic Benefit Optimization, Environmental Management, the Post-Mining Transition, and Artisanal and Small-Scale Mining (ASM). This assessment is performed both through desk- and field-based research involving diverse stakeholders. The assessment identifies major strengths, weaknesses, and gaps in the country's mining laws and policies (compared to the international best practices outlined in the MPF), which help measure the willingness of the member state to implement the MPF through its existing governmental measures. Building upon the results of this evaluation process, the second phase of the assessment involves working with the member state being assessed to develop a program for capacity-building and technical assistance aimed at addressing weaknesses and key gaps. The intent is that these strengthened capacities and an increased understanding will improve national legislation and policies in ways that enhance the mining sector's contribution to sustainable development.

This report presents the assessment for Mexico with the objective of helping the Mexican government target its efforts in implementing the MPF, supporting capacity-building efforts, and allowing for the monitoring of progress over time. The authors would like to thank their colleagues from the Government of Mexico, particularly the team of the General Directorate of Mining Development, especially José Jabalera and Mónica García, for their invaluable help and support in conducting this assessment.

Executive Summary

This report presents an assessment of Mexico's preparedness and capacity to implement the Mining Policy Framework (MPF) of the Intergovernmental Forum on Mining, Minerals, Metals, and Sustainable Development (IGF). The staff of the IGF Secretariat conducted the assessment between May and December 2021. The assessment process involved a thorough preliminary review of documentation, including key national and international laws and policies, and a 12-day field visit to Mexico. During this field visit, the evaluation team met with a wide range of stakeholders from the Mexican government, civil society, international organizations, and the private sector. The assessment phase concludes with this report.

The assessment team identified the following **key strengths** in Mexico's Mining Law and policy framework:

- Good and accessible geological information.
- Good technical and environmental regulatory development that allows for the regulation of the complexity of the mining industry.
- The socio-economic benefit optimization is, in general, good, with good integration of the industry into the local framework through clusters, alignment of educational institutions with the demands of the mining industry, and mandatory training on health and safety, among others.
- Land-use zoning allows planning for mining activities in harmony with environmental priorities and with other economic sectors.
- The Mexican government is well staffed to implement laws and policies. In addition, educational institutions offer programs and specializations necessary for the mining sector.

In addition to the above, the assessment also found **key weaknesses** in the implementation of the MPF. Mexico should focus on the following priorities for improvement:

- There is a lack of nationwide mining policy and planning for the development of the sector; the mining sector should aim to align its governance with its national goals.
- Despite vast regulatory development for the mining industry, the Mining Law is outdated and does not reflect the best practices in social issues, mine closure, and artisanal and small-scale mining (ASM).
- There is legal and political uncertainty due to inconsistencies in the permitting processes and standards, recent institutional changes, a lack of government action in the face of mining conflicts, and a lack of security at mine sites.
- Despite the efforts made through the Extractive Industries Transparency Initiative (EITI), the distribution of financial benefits is neither consistent nor transparent and does not reach the communities or mining authorities.
- The ASM sector is a neglected sub-sector, with little data, almost no regulation, and unacceptable practices that highlight the need for greater attention from the government.
- Consultation processes with communities and Indigenous Peoples do not reflect international best practices.

- Mine closure regulations do not adequately cover planning and financial assurance for mine closures that would avoid increasing environmental liabilities and the number of abandoned mines in the country.

TABLE ES1. Strengths and weaknesses of each MPF theme

MPF theme	**Legal and policy framework**
Level of progress	Medium
Strengths	• Geological information is completed and accessible to the public. • Mining concession holders submit annual production and investment reports which allow the General Directorate of Mines to make decisions. • Initiative to digitize the mining concession and registration system. • Issues related to cultural heritage are considered in the environmental impact statement (EIS (MIA in Spanish)). • The assessment of economic and social issues is considered in the EIS. • The Ministry of Environment and Natural Resources staff is trained to implement laws and policies.
Weaknesses	• The law is outdated and does not reflect the best practices. There is a lack of regulation. • Integrated social, economic, and environmental assessments are not required; opportunities and programs for benefits are identified or quantified throughout the project. • There is no policy for the development of the mining sector, and it is not included in national planning. • The concession process does not differentiate between exploration and mining rights. • There is a lack of personnel in the states due to austerity measures. • There are no proactive consultations with communities or Indigenous Peoples. It is difficult for communities to understand environmental impact assessments (EIAs). • Applications are not required to address issues related to Indigenous Peoples, resettlement, or the security of communities. • Government approval processes are not managed promptly, unambiguously, or consistently due to a lack of coordination among governmental agencies. • There is legal and political uncertainty. • There are conflicts between the mining sector and the agricultural and energy sectors. • EISs are not always published.

MPF theme	**Financial benefit optimization**
Level of progress	Medium
Strengths	• The same taxation regime applied to mining companies is used for non-mining companies. • Mexico's adherence to the EITI. • There are regulations relating to transfer prices, and the Mexican government monitors best practices to align them with national goals.
Weaknesses	• In the distribution of mining income, mining tax flows do not reach the mine-hosting communities or the mining authority. • There is no optimization of tax revenues during periods of soaring prices, and the risks of suspension or discontinuance of activities during periods of low prices are not minimized. • The policy is not flexible enough to reconcile government revenues with company profitability. • The General Law of Ecological Balance and Environmental Protection allows for the creation of economic incentives, but there is no regulation for its implementation, or it has been disputed. • There is a lack of transparency regarding company payments to the Mexican government at the project level.

MPF theme	**Socio-economic benefit optimization**
Level of progress	Medium
Strengths	• Mining activity is integrated into the local and regional framework: clusters and cluster associations. • To meet the demand for qualified labour, the government, together with the private sector, fosters the education of mining professionals through public universities. • Child labour is prohibited. • There are equal employment regulations. • There are occupational health and safety regulations specific to the mining sector and the monitoring of work-related health issues. • There are sanctions for non-compliance with health and safety regulations in the mining sector. • Concession holders are legally obliged to train their Mexican labour force on health and safety issues. More than half of the mining labour force has been trained. • The law covers national employment issues.
Weaknesses	• Public engagement and consultation are limited and at the request of community stakeholders; international standards are not observed. • There is no legislation governing consultation with Indigenous Peoples. • Security issues have little consideration in the project permitting process and in mine site monitoring. • There is a lack of dialogue with non-governmental organizations. • There are few gender-sensitive programs, with a couple of rare exceptions. • There is no integration of the mining sector with national/ provincial/ municipal development plans. Socio-economic planning is limited; social licence is not subjected to regular review. • Regarding security issues, the Mexican government does not have an effective policy to protect human rights and the security of miners and communities. • Education is not promoted as a national priority objective. • The Mexican government does not require mining companies to maintain high standards or adhere to national or international regulations on human rights.

MPF theme	**Environmental management**
Level of progress	Medium
Strengths	• An environmental impact authorization with a thorough environmental inspection and financial assurance program is required. • The Mexican government encourages companies to conduct voluntary third-party audits. • Advanced land-use planning. • Biodiversity plans and reports are required, and there are specific programs for biodiversity management in certain areas. • There is a process to coordinate the existence of natural areas and the mining sector. • There are standards on the quality of water discharged into natural watercourses. • The creation of an inventory of tailings storage facilities.
Weaknesses	• Environmental regulation is good, but environmental monitoring is inadequate. • Environmental regulations are inconsistent. • Environmental compensation funds are not applied in the corresponding areas. • Risk studies for the EIS are not adapted for mining operations. • There is no requirement to update information on tailings storage facilities, and there is a lack of adequate monitoring. • The possibility of tailings dam failures is not always considered in financial assurance. • The inventories of tailings storage facilities are incomplete and improperly executed. • There are deficiencies in considering the mining sector in environmental regulations. • Mining project approvals are hindered due to a lack of protected natural areas management plans. • There is poor water management and weak monitoring. • There are concerns from civil society about water consumption concessions. • The Clean Industry Certificate does not cover the whole operation, only the facilities voluntarily included. • There is no requirement for full contingency plans. • A deficit of personnel and budget for environmental management.

MPF theme	**Post-mining transition**
Level of progress	Low
Strengths	• There are mine closure regulations applicable to mining. • There is financial assurance for projects that could potentially cause environmental damage, which sets an example for future regulations on mine closure financial assurance. • There is an inventory of potentially contaminated sites.
Weaknesses	• There is no specific regulatory framework, and the quality required for mine-closure plans is inadequate. • There is no institutional capacity to monitor plans for mine-closure and post-mining transitions. • There is no requirement to make closure plans publicly available or to consult with affected communities. • There is no financial assurance for mine closure. • There is no requirement to use external experts. • The Mexican government provides no proper leadership on abandoned mines or preparedness for sudden closures.

MPF theme	**ASM**
Level of progress	Low
Strengths	• Mexico approved the Minamata Convention on Mercury, and is making efforts to eliminate mercury. • There is some technical assistance and funding for small-scale mining.
Weaknesses	• There are no specific regulations or policies for ASM; there is no categorization of ASM in the Mining Law. • There is little information and data about ASM in Mexico. • There are no plans for formalization, management, or monitoring of informal mining operations. • There is a lack of policies to prevent and control ASM's illegal activities. • Mexico's mercury mines are difficult to close, and they supply mercury to informal ASMs in other countries. • There are risks of serious environmental (including mercury exposure), social, and security and safety impacts. • Small-scale mining is not that small.

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Acronyms

ASM	artisanal and small-scale mining
CAMIMEX	Cámera Minera de México [Mining Association of Mexico]
CONAGUA	Comisión Nacional del Agua [National Water Commission]
CONANP	Comisión Nacional de Áreas Naturales Protegidas [National Commission for Protected Natural Areas]
Constitution	Political Constitution of the United Mexican States
DGM	Dirección General de Minas [General Directorate of Mines]
EIA	environmental impact assessment
EIS	environmental impact statement
EITI	Extractive Industries Transparency Initiative
FIFOMI	Fideicomiso de Fomento Minero [Mining Development Trust]
GDP	gross domestic product
GNI	gross national income
IGF	Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development
IISD	International Institute for Sustainable Development
INECC	Instituto Nacional de Ecología y Cambo Climático [National Institute of Ecology and Climate Change]
INEGI	Instituto Nacional de Estadística y Geografía [National Institute of Statistics and Geography]
LFD	Ley Federal de Derechos [Federal Law on Duties]
LGEEPA	Ley General del Equilibrio Ecológico y la Protección al Ambiente [General Law of Ecological Balance and Environmental Protection]
LGPGIR	Ley General de Prevención y Gestión Integral de Residuos [General Law for the Prevention and Integral Management of Waste]
LISR	Law on Income Tax [Ley de Impuesto Sobre la Renta]
MPF	Mining Policy Framework
NGO	non-governmental organization
NOM	Norma Oficial Mexicana [Official Mexican Standard]
NRGI	Natural Resource Governance Institute
OECD	Organisation for Economic Co-operation and Development
PNA	Protected Natural Area
PROFEPA	Procuraduría Federal de Protección al Ambiente [Federal Attorney's Office for the Protection of the Environment]
SEMARNAT	Secretaría de Medio Ambiente y Recursos Naturales [Ministry of Environment and Natural Resources]
SGM	Servicio Geológico Mexicano [Geological Mining Service]

States	Mexican states and the City of Mexico
STPS	Secretaría del Trabajo y Previsión Social [Ministry of Labour and Social Welfare]
UCAE	Unidad de Coordinación de Actividades Extractivas [Coordination Unit for Extractive Activity]
UNDP	United Nations Development Programme

Photo: Epitacio Robledo

1.0 Introduction

The Mexican mining sector is large, diverse, and ancient. Considering both foreign and local investments in the sector, the government manages 24,000 mining concessions, equivalent to 16.9 million ha. There has been a de facto moratorium on new concessions since 2019, which has left a large number of proponent requests unanswered.

This assessment report presents the context for the development of the mining legal framework in Mexico. It also focuses on key policy and legislative strengths and weaknesses, using the thematic areas of the Mining Policy Framework (MPF) as a reference.

The Secretariat of the Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development conducted an assessment in 2021 using the following methodology:

- Research: a review of laws, policies, regulations, and contracts governing the Mexican mining sector, as well as relevant literature on the sector (May–August 2021).
- A visit to Mexico City to conduct interviews with stakeholders and relevant parties from the government, civil society, and the private sector (September 2021).
- Field visits to (i) Fresnillo Plc Saucito mine in Zacatecas, (ii) La Chiripa mine in Zacatecas (where environmental liabilities were discovered), (iii) Asociación de Pequeños Mineros de Zacatecas (small miners' association in Zacatecas), (iv) Cozamin mine, (v) Minera Cuzcatlán in San José del Progreso, Oaxaca and (vi) Buena Vista mine – Grupo México in Sonora (September and October 2021).
- Preparation of this report (October 2021–January 2022).
- Final assessment report (April 2022).


Photo: Epitacio Robledo

2.0 Mexico: National context

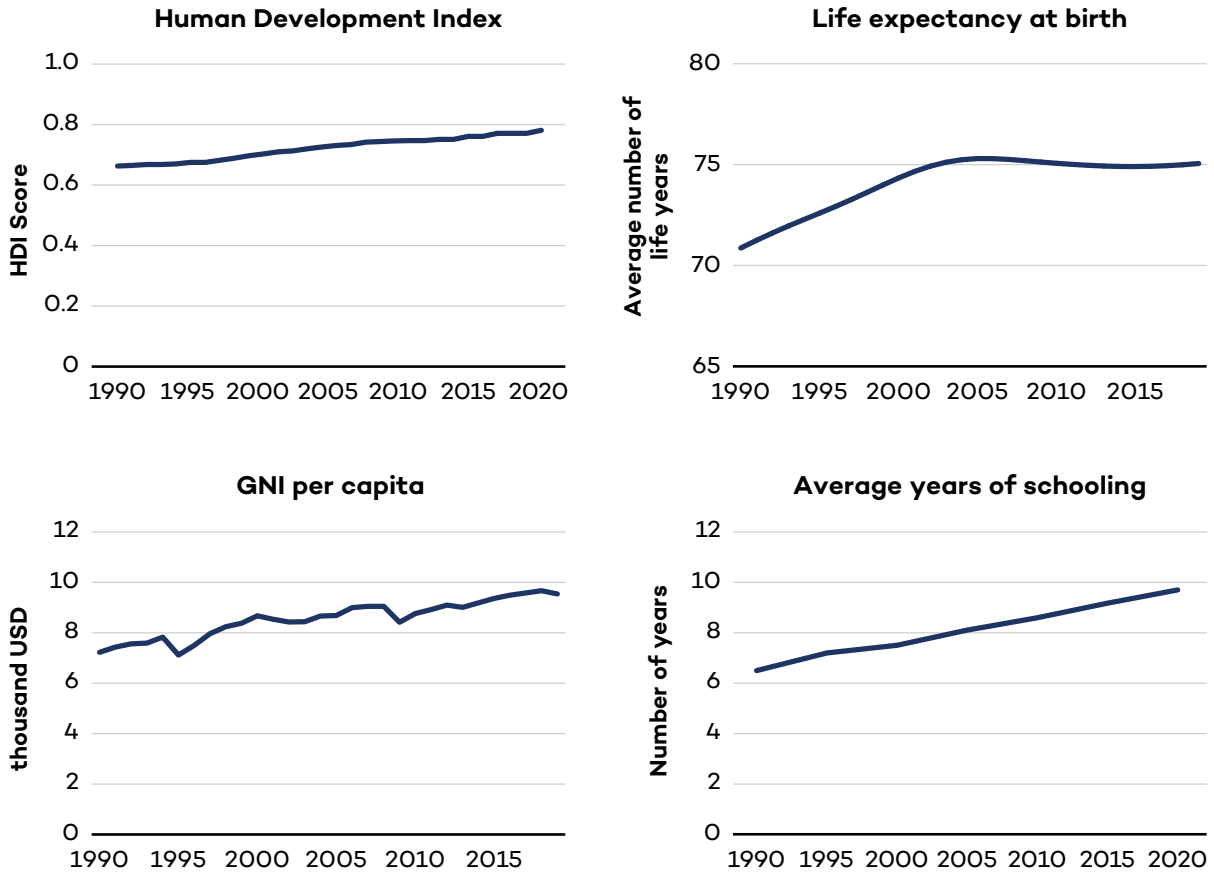
The United Mexican States, or Mexico, is a country located in North America. To the north, it borders the United States, to the south Guatemala and Belize, to the east the Gulf of Mexico, and to the west the Pacific Ocean. Mexico is strategically integrated into commercial trade with the United States and Canada through the Mexico–United States–Canada (T-MEC) trade agreement. Its capital is Mexico City, and its territory is divided into 32 states.

According to the 2020 census, the population of Mexico is approximately 126,014,024 inhabitants (Instituto Nacional de Estadística y Geografía [INEGI], 2020). There are multiple ethnic groups, with four main population groups: Indigenous Peoples (15.1%), Black or African descendants (1.2%), European descendants, and the mestizo population. There is no official or estimated number of members of the mestizo population, but it constitutes most of the Mexican population. The country's official language is Spanish; there are 68 Indigenous languages recognized in the General Law of Indigenous Peoples' Linguistic Rights (Ley General de Derechos Lingüísticos de los Pueblos Indígenas) (2015) and the 2008 *Catálogo de las Lenguas Indígenas Nacionales: Variantes Lingüísticas de México* (Catalogue of National Indigenous Languages: Linguistic Variants of Mexico) with self-nominations and geostatistical references (Central Intelligence Agency of the United States, 2022).

According to the United Nations Development Programme (UNDP, 2020), Mexico ranks high in human development at 74th out of 189 countries in the latest Human Development Index. This places Mexico at the highest level of development among Central American countries. Life expectancy is 75.1 years, which is close to the regional average of 75.6 years in Latin America and the Caribbean (UNDP, 2020).

Mexican incomes are comparatively high. While the gross national income (GNI) regional average per capita is USD 7,757, the average for Mexico is USD 8,608. Nonetheless, this national GNI hides a high degree of inequality: the richest 20% have 10 times the income of the poorest 20%, while in an average Organisation for Economic Co-operation and Development (OECD) country, the income of the richest 20% is about five times that of the bottom 20% of households in the bottom 20% of the income distribution line. Moreover, while the average per capita GNI in Mexico is one of the highest in the region, it hides a substantial degree of gender inequality: on average, women can expect to earn 9.6% less than men (USD 1,000 vs. USD 904). Mexico has one of the highest gender inequality ratings in the region (see Gender Context in this section) (OECD, 2022).

FIGURE 1. Human Development Index trends in Mexico, 1990–2020



Sources: (a) Instituto Nacional para la Evaluacíon de la Educacíon, n.d.; (b) UNDP, 2022; (c) World Bank, 2022b; (d) World Bank, 2022a.

Economic Context

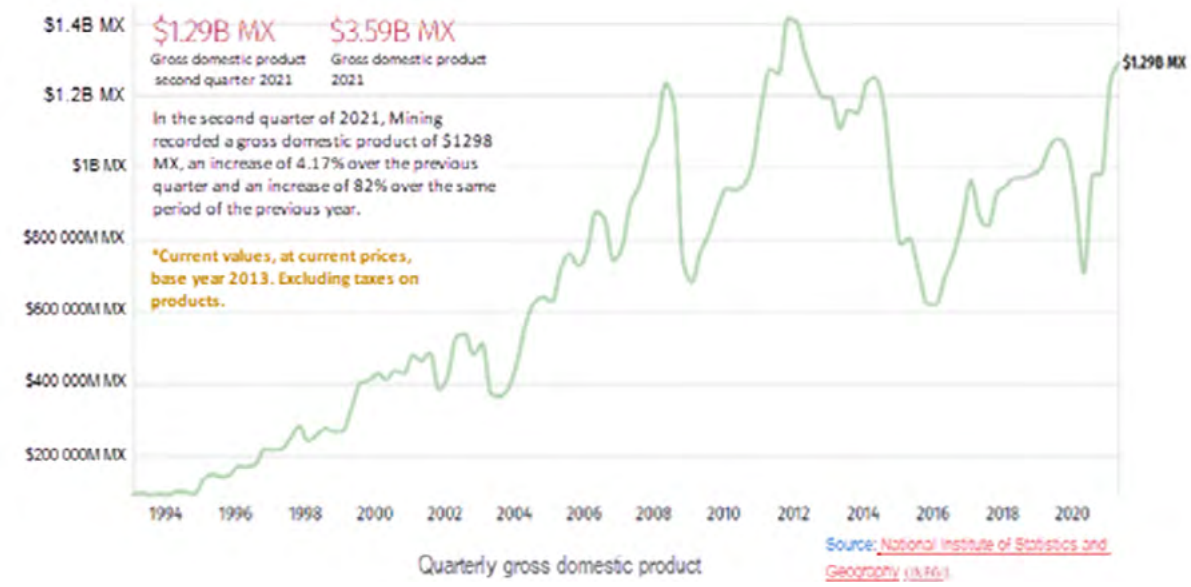
Mexico is one of the 15 largest economies in the world and the second-largest economy in Latin America. However, in the last 3 decades, Mexico has been performing below expectations in terms of growth, inclusion, and poverty reduction in comparison to similar countries. While the Mexican economy had an annual growth rate of 2% between 1980 and 2018, in the last 5 years, the annual average gross domestic product (GDP) decreased by 0.31% (World Bank, 2021). This decrease is due to the fall in oil prices and the crisis caused by the COVID-19 pandemic, during which the economy shrank by 8.3% in 2020. In 2021, the economy recovered considerably, with growth of 5.9% (OECD, 2021).

The economy is based on the Mexican peso. The services sector accounts for more than half of the GDP (64.5%) (Central Intelligence Agency of the United States, 2020). In the second quarter of 2021, the services sector accounted for 64.07% of GDP and 61.07% of employment. While the industrial sector accounted for 28.33% of GDP and 25.12% of employment, the primary sector accounted for 3.37 % of GDP and 13.25 % of employment (Banco Nacional de Obras y Servicios Públicos, 2021).

Mining is part of Mexico's primary economic sector. Mexico is the world's leading producer of silver and one of the world's top 10 producers of 17 different minerals. The mining-

metallurgical sector accounted for 2.3% of the country's GDP and 8.3% of its industrial GDP in 2020 (Secretaría de Economía, 2021a).

FIGURE 2. Evolution of mining share in the GDP (1993-2021)



Source: INEGI, 2021.

However, Mexico's economic growth, historically a frontrunner in the region, does not yet translate into shared prosperity. In comparison to the decreasing trend observed in other countries in the region, income inequality in Mexico has only slightly changed since 2004, despite its poverty reduction (IMF, 2019).

Mexico ranked strongly at 48 out of 141 in the World Economic Forum's *Global Competitiveness Report 2018* (Schwab, 2019), with only Chile ranked higher within the Latin American region. On the other hand, despite its worsening ranking since the 2012 index, Mexico also ranks high on the Transparency International Corruption Perceptions Index, with a score of 31 out of 100, placing it at 124 out of 180 countries in the 2020 world ranking (Transparency International, 2019).

Mexico ranks among the countries with the highest levels of crime when compared to other countries. According to the *Global Peace Index 2020*, Mexico ranked 137 out of 163 countries and was ranked the least peaceful country in the Central America and Caribbean region (Institute for Economics & Peace, 2020).

Environmental Context

The Political Constitution of the United Mexican States (2015) (hereafter referred to as "the Constitution") establishes that the state must ensure respect for the right of "every person … to a healthy environment for his/her own development and well-being" (Article 4). Article 27 emphasizes that all natural resources, minerals, or substances belong to the nation and addresses the issue of the conservation of natural resources.

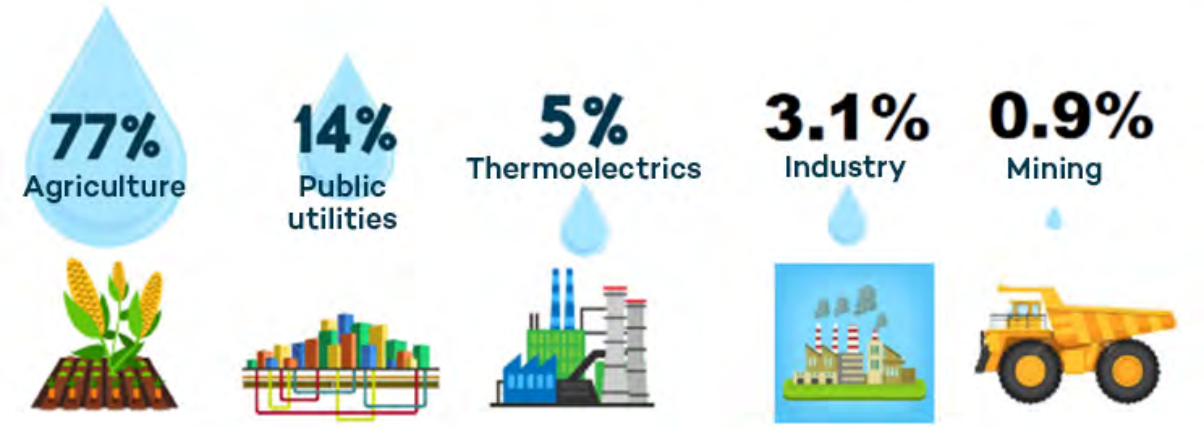
Mexico has a diverse topography and geography. The northern and central regions of Mexico are very arid and semi-arid and occupy 56% of the territory. The climate in 37% of

the territory—in the mountains and coastal plains of the Pacific, the Gulf of Mexico, and the northeastern part of the Yucatan—is sub-humid. The remaining 7% of the territory is considered humid. Mexico's location between two oceans and its complex topography both increase its exposure to extreme hydro-meteorological events such as tropical cyclones, frosts, heat waves, and floods (World Bank, 2020c).

Mexico's hydrographic network is around 633 km long. An estimated 87% of surface water runoff flows along the riverbeds of Mexico's 50 main rivers, and 65% of the continental land area is covered by water basins (Comisión Nacional del Agua, n.d.). Mexico has 1,471 water basins, all greatly varying in size (Secretaría de Medio Ambiente y Recursos Naturales et al., 2010).

Water scarcity in Mexico is set to worsen by 2050 due to climate change and rapid urbanization. Mexico could be one of the 10 countries in which water scarcity will increase the most, potentially affecting 74.8 million inhabitants, an increase of almost 50% (He et al., 2021). The mining sector has low demand for water resources compared to other economic activities.

FIGURE 3. Comparison of water consumption in different economic sectors



Source: Cisneros et al., 2010.

However, it is important to note that the use of water for mining is not the same throughout the country. The north, a fairly dry region, is undoubtedly the area with the greatest mining activity and, consequently, the largest water consumer in the mining industry. According to the non-governmental organizations (NGOs) CartoCrítica and the Heinrich Böll Foundation (Llano, 2016), half of the water used for all mining activities is extracted from only three Mexican states: Sonora (107.9 million m^3/a), Zacatecas (55.8 million m^3/a), and Michoacán (44.4 million m^3/a).

Mexico's privileged geographical position supports its 6,331 wetlands, 142 of which have been designated Ramsar sites due to their international importance within the parameters of the Ramsar Convention (Ministry of Agriculture and Rural Development, 2018). Mexico has the second-largest number of Ramsar sites among countries in the world. Among them, Sian Ka'an is a Ramsar site (#1,329) with an area of 652,193 ha. This Ramsar site has two other international designations—it is a World Heritage Natural Site and a Man and Biosphere Reserve—and is an important regional site that holds nine types of ecosystems (Comisión Nacional de Áreas Naturales Protegidas [CONANP], 2016).

In Mexico, there are several types of federal- and state-protected natural areas, which are either ejidal or private property. The National Commission for Protected Natural Areas

[CONANP] currently manages 183 federal natural areas representing 90,942,124 ha and supports 371 Voluntary Conservation Areas with a total area of 596,867.34 ha; 61 natural areas are also part of the National System of Protected Areas (CONANP, 2022).

Protected Natural Areas (PNAs) cover 10.93% of the national territory, and the protected marine area corresponds to 22.05% of Mexico's marine territory (CONANP, 2022). There are mining activities in some areas of the natural protected areas, permitted in accordance with legislation that more strictly regulates these activities when conducted in such areas.

Mexico also possesses extensive biological wealth: it includes 284 key biodiversity areas corresponding to around 263,119 km^2, of which 38 are protected, 131 are partially protected, and 104 are entirely unprotected (Key Biodiversity Areas Partnership, 2021). The country is considered "megadiverse," as it is part of the small group of nations with the greatest diversity in animals and plants that together account for 70% of global species diversity (National Commission for the Knowledge and Use of Biodiversity, 2020).

Tropical and forest areas are home to most of the rich genetic diversity (estimated at 10% of the world total) present in the country. At the same time, Mexico has one of the highest deforestation rates in the world, ranging from 75,000 ha/year to almost 1.98 million ha/year (Torres Rojo, 2020). It is estimated that in the period 2001–2018, an average of 212,070 ha of forest land was lost every year.

Mexico's climate varies between tropical and desertic. Climate change has had an obvious impact on the Mexican territory, generating an increase in desertification, higher extreme temperatures, changes in rain patterns, earlier hot seasons, the loss of forests, and the disappearance of glaciers (Ministry of Environment and Natural Resources, 2016). In response to climate changes in its territory, Mexico adopted the General Law of Climate Change (Ley Federal de Cambio Climático) in 2012, which was later amended in 2018, to ensure the right to a healthy environment.

Social Context

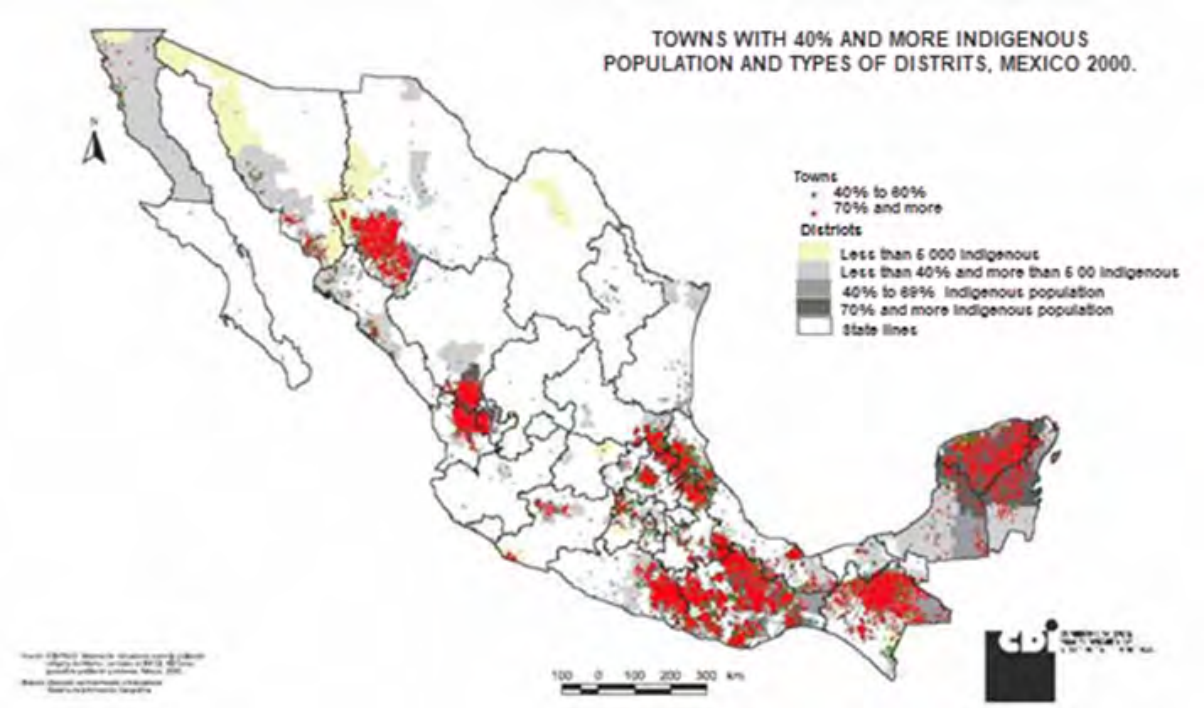
The population of Mexico is composed of the following groups: mestizo, Euro-descendants, Indigenous, Afro-descendants, and others. While the Mexican government does conduct ethnic censuses, the results obtained from these censuses are not made public. The two predominant population groups are mestizos and light-skinned/Euro-descendants. More concretely, 15.1% of the Mexican population is estimated to be Indigenous (International Work Group for Indigenous Affairs, 2021), and 1.16% is estimated to be Afro-descendant (INEGI, 2020).

There are 70 different groups of Indigenous Peoples in Mexico (Sistema de Información Cultural, n.d.). The rights of Indigenous Peoples are recognized in the Constitution. Article 2 of the Constitution states that the Mexican nation is multicultural, based originally on its Indigenous Peoples, and establishes Indigenous identity as an essential criterion in determining to whom the provisions on Indigenous Peoples apply. The Constitution declares the right to self-determination, specifying, however, that it secondary to national unity. The basis for Indigenous consultation is the right to self-determination, as it means making decisions related to their lands.

Indigenous Peoples and communities must be recognized in the constitutions and laws of the states, as stated in the Constitution (Article 2). About 26 states have at least one law

that recognizes and assures some rights for Indigenous Peoples and communities (Comisión Nacional para el Desarrollo de los Pueblos Indígenas, 2018).

FIGURE 4. Indigenous territories of Mexico



Source: Comisión Nacional para el Desarrollo de los Pueblos Indígenas, 2006.

The Indigenous population in Mexico is present in a quarter of its towns, in almost all of the country's districts—only 30 of them do not have an Indigenous presence—and in all states. While Mexico's official language is Spanish, the level of monolingualism in this part of the population is extremely high: almost a quarter of the Indigenous-speaking population does not speak Spanish (Comisión Nacional para el Desarrollo de los Pueblos Indígenas, 2006).

Gender Context

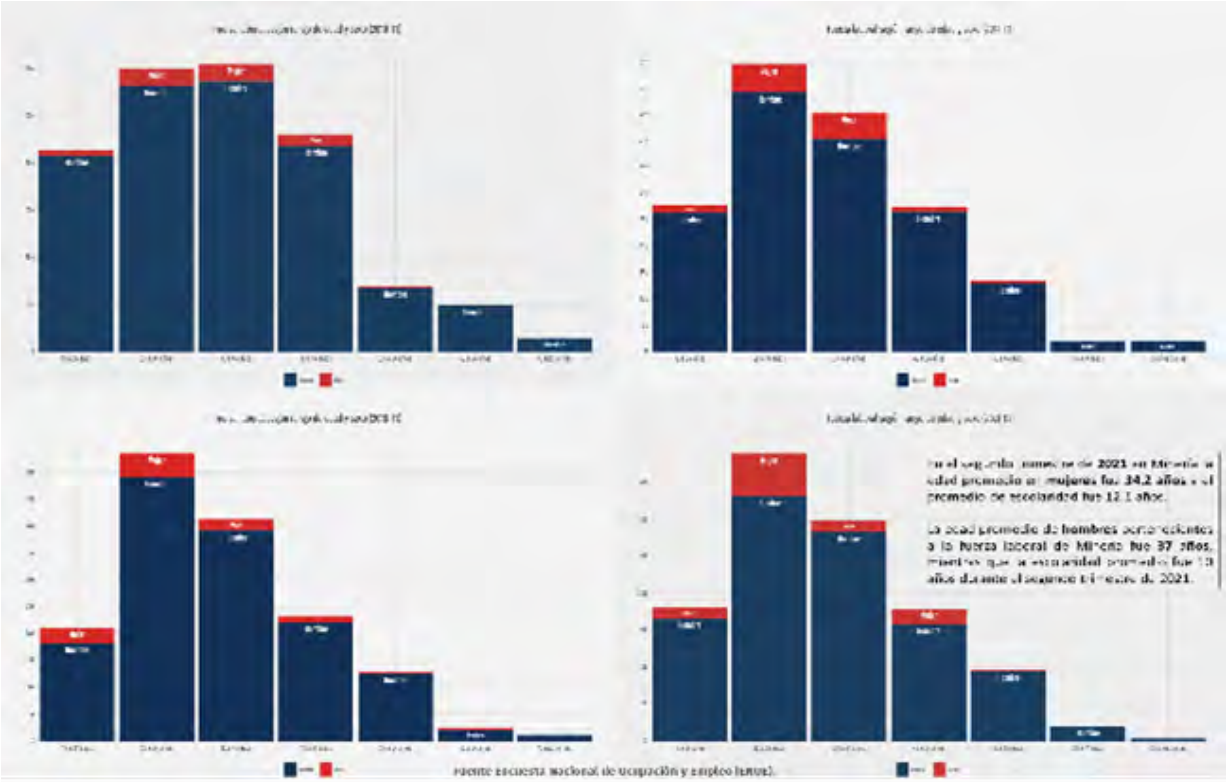
According to the Gender Development Index by country, Mexico is classified in group 2, indicating a medium-high level of gender equity in the country (UNDP, 2020). The index value for Mexico is 0.957, lower than the regional average for Latin America and the Caribbean, indicating that there are higher levels of gender inequality in Mexico than the average for the region. Women in Mexico live substantially longer than men (77.8 years for women versus 72.1 for men), but less than the regional average of 78.6 years. Girls stay in school for an average of 8.4 years and remain in the educational system longer than boys. However, these levels are below the regional average of 8.6 years (UNDP, 2021).

Women's participation in the Mexican mining sector has been increasing steadily since 2008. In 2019, women's participation in the mining-metallurgical sector was 15.7%, an increase of 5.6% compared to 2018, with the creation of 3,153 new job positions in this period (Cámara Minera de México [CAMIMEX], 2020). As can be seen in Figure 6, in 2020, due to the pandemic crisis, the percentage of women remained unchanged.

FIGURE 5. Female workforce in mining 2008–2020

Source: CAMIMEX, 2020.

FIGURE 6. Workforce and gender in the mining sector (2010–2021)



Source: Dataméxico, 2021.

In 1938, Mexico ratified Convention 045 on Underground Work (Women), which prohibits the employment of women in underground mines and quarries. Many countries have adopted Convention 176 on health and safety in mines, which replaced the provisions of Convention 045 by protecting all mineworkers, both men and women. To date, Mexico has not withdrawn from Convention 045 or ratified Convention 176.

Photo: Epitacio Robledo

3.0 Mining Context

The history of mining exploration and exploitation in Mexico began with the activities of the ancient settlers, who used to adorn and protect their bodies with medallions, masks, breastplates, and earrings, in addition to using tools and pots made of metals obtained from mineral deposits found on the surface. For the Mexican people, the history of mining is the history of Mexico, especially the legendary golden wealth of the Aztec Empire.

Mining became more organized following the Spanish conquest, with the discovery of the new deposits that were the driving force behind the conquest of New Spain. The silver deposits of the mining districts of Guanajuato, Zacatecas, Chihuahua, and Guerrero, among others, have allowed mining activities to continue for more than 500 years, up to the present day (Mining Development Trust, 2018). Cities such as Durango, Chihuahua, Monterrey, Zacatecas, and San Luis Potosí were founded and built around mining activity.

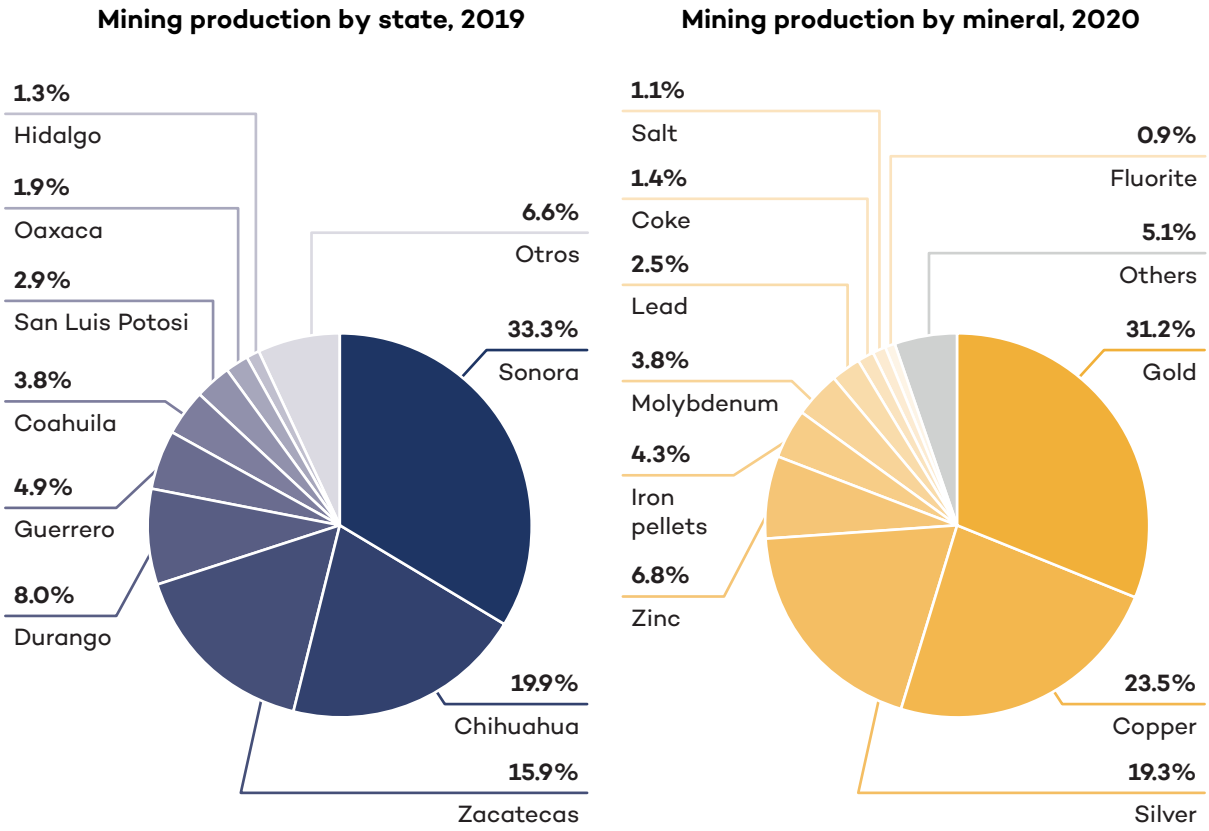
By the end of the Mexican War of Independence, mining operations had changed hands several times, among the Americans, Germans, Belgians, English, and French. After significant fluctuations in foreign investment in the mining sector and with the economic growth of the United States, the main mining operations in Mexico ended up in the hands of the Americans.

The 20th century found the mining sector in foreign hands and with activity that contributed little to the Mexican economy or goals. In 1961, the new Regulatory Law of Section 27 of the Constitution in mining matters changed perpetual concessions to concessions for a duration of 25 years if the ownership was mainly foreign; it also created incentives for the Mexicanization of the mining industry. On the eve of the signing of the North American Free Trade Agreement in 1992, a new Mining Law, more open to foreign investment, was published (Miranda, 2020), which prompted several mineral discoveries that are still producing today.

Geological knowledge began to develop with the 1938 oil expropriation. Since then, there has been renewed and more widespread awareness about the riches underground. In addition, great technological advances in cartography with new exploration techniques have been achieved, especially through the geological-mining, geophysical, and geochemical mapping software model of the Mexican Geological Service (Servicio Geológico Mexicano [SGM]) of 2017. The mining sector has always been eclipsed by the hydrocarbon sector, which has greater economic relevance. However, mining has increased during the last few years, with the number of ongoing projects doubling (Natural Resource Governance Institute [NRGI], 2021).

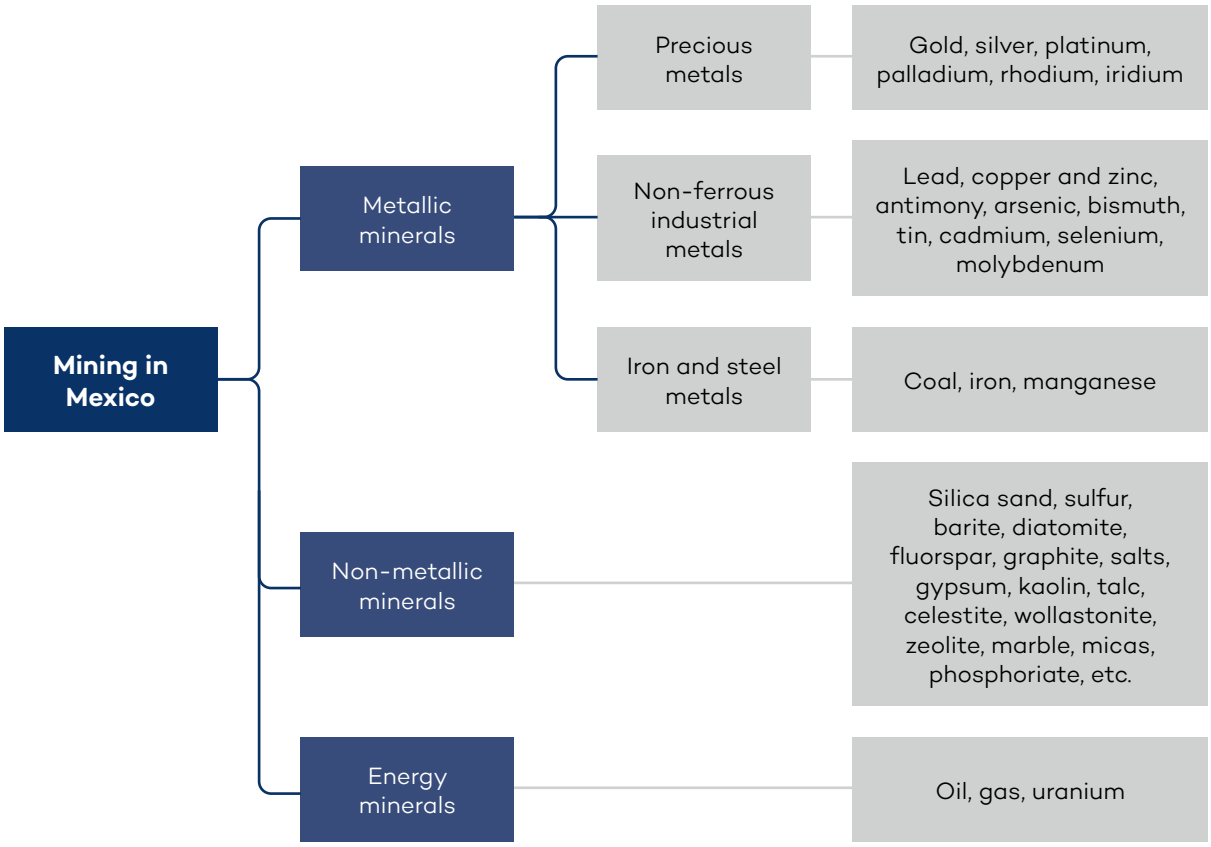
Currently, there are mining operations in all the Mexican states (Secretaria de Economia, 2021b). Based on 2020 data, Mexico is one of the top 10 worldwide producers of 17 minerals. The top four states in mining production are Sonora, Chihuahua, Zacatecas, and Durango.

FIGURE 7. Mining production by state and by mineral



Source: Secretaría de Economía, 2021a.

FIGURA 8. Minerals of Mexico



Source: Authors

Despite the growth of the mining sector, from the beginning of his term of office, current President Andrés Manuel López Obrador has been critical of it and of mining concessions and the mining sector. This stance culminated in the suspension of the issuance of new mining concessions starting in 2019. Operations with concessions granted before that year are still in force and operating in the exploration and production phases (NRGI, 2021).

As of December 2019, there were 24,066 mining concessions operating in an area of approximately 16.83 million ha, equivalent to 8.59% of the national territory (SGM, 2020). There are 1,190 mining projects in 16 states, mainly concentrated in Sonora, Chihuahua, and Durango. Out of this total, 307 are in the exploration stage, 78 are in production, 43 are in development, 754 are on hold, and eight operations have reported their closure. Regarding the minerals mined in these projects, 737 of them mine precious metals—175 are polymetallic, 166 mine copper, 69 mine iron ore, and the remaining 43 mine other metals and minerals (CAMIMEX, 2021).

In the third quarter of 2021, the mining sector recorded a GDP of MXN 1.37 billion (approximately USD 68 million), an increase of 4.02% from the previous quarter and 37.3% over the same period of the previous year. In 2020, 179 of the mining companies operating in Mexico were run with capital from a foreign origin, of which 70% corresponds to Canadian capital, 11% to U.S. capital, and 4% to Chinese capital. The main companies in the Mexican mining industry are members of CAMIMEX.

FIGURE 9. Main producing mines

Source: Secretaría de Economía, 2021a.

The largest companies and projects currently in operation in Mexico are the following:

Grupo México (American Mining Corporation)

Grupo México is Mexico's top copper producer. Its mining operations date back to 1890 when Asarco started operations in Mexico. Grupo México acquired Asarco in 1999, continuing operations to this day. The Mining Division of Grupo México is represented by its subsidiary, American Mining Corporation (AMC), with its main subsidiaries being Southern Copper Corporation (SCC) in Mexico and Peru, ASARCO in the United States, and Minera Los Frailes in Spain.

Its mines currently in operation are in the states of Sonora, Chihuahua, Coahuila, Zacatecas, San Luis Potosí, and Morelos. To date, Grupo México has nine ongoing mining projects and six future mining projects in Mexico. Among its operations, there are two open-pit mines (La Caridad and Buenavista del Cobre) and several zinc and silver underground mines. Buenavista is notably Mexico's largest mine and the third-largest copper mine in the world in terms of reserves. In 2020, American Mining Corporation maintained its position as the fifth-largest copper producer in the world (Grupo México, 2020).

Industrias Peñoles S.A. de C.V.

Peñoles is a subsidiary company of the Mexican-owned Grupo BAL. Founded in 1887, it operates in the states of Sonora, Chihuahua, Coahuila, Tamaulipas, Durango, Zacatecas, San Luis Potosí, Guerrero, Oaxaca, and México.

Listed on the Mexico Stock Exchange since 1968, Peñoles is one of the two largest producers of refined silver. The company plays a leading role in the production of gold and refined lead in Latin America and is one of the world's leading producers of refined zinc and sodium sulphate. Peñoles operates 10 mining units and nine plants/facilities; it has one mining site under

construction. In 2020, the company was responsible for providing 29,988 direct jobs and 31,478 indirect jobs.

In the year 2020, Peñoles produced 824,100 oz of gold, 62.6 million oz of silver, 86.4 kilotonnes of lead, 288.1 kilotonnes of zinc, and 21.4 kilotonnes of copper (Peñoles, 2020).

Minera Fresnillo Plc

Minera Fresnillo Plc is a leading precious metals group based in Mexico. Fresnillo is the largest primary silver-producing company in the world and Mexico's largest gold producer. Fresnillo plc has been listed on the Mexico and London Stock Exchanges since 2008. Fresnillo's mines are located in the states of Sonora, Chihuahua, Durango, and Zacatecas.

Fresnillo plc currently has six operating mines in Mexico located in Fresnillo, Saucito, Ciénega, Herradura, San Julián, and Noche Buena (which is approaching the end of its life), and San Julián; two development projects—the Pyrites Plant at Fresnillo and Juanicipio, both of which have been completed constrcution but are awaiting their approvals to operate; and three advanced exploration projects—Orisyvo, Rodeo, and Guanajuato. Operations at Soledad-Dipolos are currently suspended because of a dispute over surface land ownership.

Fresnillo's products include silver, gold, lead, and zinc. In 2021, the attributable gold production was 751,200 oz, the silver production was 53.1 million oz, lead was 56 573 tonnes, and zinc was 99,397 tonnes (Fresnillo plc, 2022).

Minera Frisco S.A.B de C.V.

Minera Frisco S.A.B. de C.V. is a Mexican mining company currently operating eight underground and open-pit mining sites. The company produces copper, zinc, and lead-silver concentrates, as well as copper cathodes and doré bars in Chihuahua, Baja California, Zacatecas, Aguascalientes, and Sonora.

In 2020, Frisco produced 23,600 oz of gold, 1.2 million oz of silver, and 5,768 tonnes of copper (Minero Frisco, 2020).

Newmont Goldcorp

Newmont Goldcorp is an American mining company with worldwide operations, including in Mexico, where its operations are focused on the Peñasquito project, located in the State of Zacatecas. Peñasquito is an operation with one open pit, Peñasco, and two processing plants. Peñasquito produces gold, silver, lead, and zinc.

The project has been producing about 129,000 oz of gold yearly since 2019 (Newmont, n.d.).

Minera Autlán S.A.B. de C.V

Minera Autlán S.A.B. de C.V. is a Mexican company with a direct labour force of 2,500 employees operating in Hidalgo, Puebla, Veracruz, Durango, Sonora, Nuevo León, Tamaulipas, and Mexico City. Founded in 1953, Minera Autlán is a leading company in the domestic market and in the manufacture of ferroalloys and manganese derivates, exporting to more than 10 countries around the world. The company's products include ferroalloys, manganese, manganese derivatives, electrolytic manganese dioxide, precious metals, and energy.

In 2020, Minera Autlán produced 213,9000 Mt of ferroalloys. These included 193,200 Mt of manganese, 30,200 oz of precious metals, and 11,000 Mt of electrolytic manganese dioxide (Autlán, 2020).


Photo: Epitacio Robledo

4.0 Mexico: Key laws, policies, and institutions

Mexico is a presidential republic with three independent branches of power: the Executive, the Legislative, and the Judiciary. Andrés Manuel López Obrador has been the president since December 2018. His presidential term will end in 2024. The Constitution establishes a federal system for Mexico in which all states have political powers that have been specially delegated to them.

The Constitution establishes a special regime on the use of natural resources and determines that

> The Nation holds the direct ownership of all the minerals or substances which can be found in veins, seams, rock masses or deposits and which constitute deposits whose nature is different from the components of the land, such as minerals from which metals and metalloids can be extracted for industrial activities; deposits of precious stones, rock salt and salt flats formed directly from seawater; and products derived from rock decomposition when their exploitation requires underground works; minerals or organic deposits of materials suitable for use as fertilizers and solid mineral fuels (Article 27 of the Constitution).

The House of Representatives and the Senate are vested with the power to legislate on mining issues throughout the republic (Article 73, paragraph X of the Constitution). For this reason, mining is considered federal in nature, and neither the Legislature of the States nor the Legislature of the City of Mexico (collectively referred to as the "states" hereafter) can regulate minerals or the substances described in Article 27 of the Constitution.

However, the powers not expressly granted by the Constitution to the federal authorities shall be construed as reserved for the states (Article 124 of the Constitution). The substances and minerals not listed in the Mining Law, as well as construction materials, may be regulated by the legislative branches of the states, provided that they are not obtained from underground mines.

Mining Legislation

The Mining Law was passed in 1992 and repealed the former law of 1975. The Mining Law lists the minerals and substances that may be exploited through mining concessions (Section 4). In 2005 and 2014, the Mining Law underwent significant amendments to reduce paperwork and establish preferential rights of Indigenous Peoples for the obtention of concessions on their territories. It also established that the exploration and exploitation of oil and other hydrocarbons and public energy supply and distribution systems have pre-eminence over mining activities when carrying out both activities in the same area is not compatible (Section 6).

Several rules, regulations, and guidelines have been published to regulate mining legislation in detail.

The most important legislation and regulations applicable to mining are listed below:

- Mining Law, DOF 26-06-92
- Law Declaring Uranium and Thorium Deposits, and Other Substances from which Fissile Isotopes Capable of Producing Nuclear Energy are Obtained, as National Mineral Reserves, DOF 26-01-1950
- Regulation of the Mining Law, DOF 12-10-2012
- Guide for Submitting the Mining Environmental Impact Statements: Specific Area (2002)
- Investor's Manual for the Mexican Mining Sector
- Official Mexican Standard [Norma Oficial Mexicana] NOM-023-STPS-2012, Underground and opencast mines – Health and Safety Conditions at Work, DOF 11-10-2012
- Official Mexican Standard NOM-032-STPS-2008, Underground Coal Mines Safety, DOF 23-12-2008
- Official Mexican Standard NOM-120-SEMARNAT-2020, which establishes specifications on environmental protection for direct mining exploration activities in agricultural, stockbreeding or wasteland areas, and in areas with dry and temperate climates where the vegetation of xerophile shrublands, tropical deciduous forest, coniferous forest, or holm oak develop, DOF 11-11-2020.

Environmental Laws

Mexico has issued and applied laws and regulations as part of a strategy to mitigate the environmental impacts caused by society and by the different productive sectors on the environment. In 1988, with the enactment of the General Law of Ecological Balance and Environmental Protection (Ley General del Equilibrio Ecológico y la Protección al Ambiente [LGEEPA]), this strategy became more solid. The LGEEPA regulates activities that may have an impact on the environment and sets out measures to mitigate and prevent these impacts. Since 1988, this law has undergone several amendments, and the 1996 amendment added international environmental principles derived from Mexico's adoption of the Convention on Biological Diversity at the United Nations Conference on Environment and Development, which was held in Rio de Janeiro in 1992.

This law was originally designed to regulate all issues related to the environment, and its regulations specify the requirements to be met. However, for certain issues, the law was insufficient, and the development, by subject (e.g., water, air, soil, etc.), of Mexico's own laws was required.

The LGEEPA is based on Article 27 of the Constitution. It aims to preserve and restore ecological balance and protect the environment throughout the Mexican territory. This law assigns competencies among the federation, states, and municipalities to concurrently deal with all the issues under the scope of the law.

The Official Mexican Standards (Norma Oficial Mexicana [NOM]) issued by the Ministry of Environment and Natural Resources (Secretaría de Medio Ambiente y Recursos Naturales [SEMARNAT]) are another type of instrument used to regulate environmental policy. The purpose of these standards is to establish the requirements, specifications, conditions, procedures, goals, parameters, and permissible limits that should be addressed when developing economic activities such as mining. They are also intended to encourage economic agents to carry out processes and use technologies in a way that protects the environment and to bear the costs of the environmental impacts they cause. The development process for NOMs is established in the Federal Law on Metrology and Standardization (Section 36 of the LGEEPA).

Mexico's general environmental policy is framed in the Sector-wide Program of Environment and Natural Resources 2020–2024, which is based on the National Development Plan. The program is in line with a vision to preserve and restore ecological balance, and it aims to

- Promote the preservation, protection, restoration, and sustainable use of ecosystems and their biodiversity through an approach based on land use and human rights.
- Strengthen climate action in order to move toward a low-carbon economy.
- Promote water access as a cornerstone of well-being.
- Promote a pollution-free environment in water, air, and soil.
- Foster environmental governance through free, effective, meaningful, and co-responsible citizen engagement in public policy decisions.

Environmental legislation applicable to mining:

- General Law on Ecological Balance and Environmental Protection, DOF 28-01-1988
- Regulation of the General Law on Ecological Balance and Environmental Protection regarding Environmental Impact Assessments, DOF 30-05-2000
- Regulation of the General Law on Ecological Balance and Environmental Protection regarding the Self-Regulation and Environmental Audits, DOF 29-04 -2010
- Regulation of the General Law on Ecological Balance and Environmental Protection regarding Ecological Zoning, DOF 8-08- 2003
- Federal Law on Environmental Liability, DOF 7-07-2013

Biodiversity

- General Law of Sustainable Forestry Development, DOF 5-06-2018
- General Law of Wildlife, DOF 3-07-2000

- Regulation of the General Law on Ecological Balance and Environmental Protection Regarding Protected Natural Areas, DOF 30-11-2000
- Official Mexican Standard NOM-059-SEMARNAT-2010, Environmental protection – Native species of Mexico forest flora and fauna – Categories of risk and specifications for their inclusion, exclusion, or change – List of species at risk, DOF 30-12- 2010

Waste

- General Law for the Prevention and Comprehensive Handling of Environmental Waste, DOF 8-10-2003
- Official Mexican Standard NOM-157-SEMARNAT-2009, which establishes the elements and procedures to implement management plans for mining waste and tailings, DOF 30-08-2011
- Official Mexican Standard NOM-155-SEMARNAT-2007, which establishes the environmental protection requirements for leaching systems for gold and silver ores, DOF 15-01-2010
- Official Mexican Standard NOM-159-SEMARNAT-2011, which establishes requirements for environmental protection for copper leaching systems, DOF 13-02-2012
- Official Mexican Standard NOM-147-SEMARNAT/SSA1-2004, which establishes the criteria for determining remediation concentrations for soil contaminated by arsenic, barium, beryllium, cadmium, hexavalent chromium, mercury, nickel, silver, lead, selenium, thallium, and/or vanadium, DOF 2-03-2007
- Mexican Standard NMX-AA-132-SCFI-2006 on soil sampling for metal and metalloid identification and quantification, and sample handling, DOF 5-09-2006
- Official Mexican Standard NOM-141-SEMARNAT-2003, which establishes the procedure to characterize the tailings, as well as the specifications and criteria for the characterization and preparation of the site, planning, construction, operation, and post-operation of tailings dams, DOF 2-III- 2007

Water

- National Waters Law, DOF 1-12-1992
- Regulation of the National Waters Law, DOF 12-01-1994
- Regulation for the Determination and Payment of the Non-Expiration Assurance Fee for National Water Rights, DOF 27-05-2011
- Official Mexican Standard NOM-001-SEMARNAT-1996, which establishes the maximum permissible limits of contaminants in wastewater discharges into national assets and watercourses, DOF 6-01-1997

Others

- General Law on Climate Change, DOF 6-06-2012
- Regulation of the General Law on Ecological Balance and Environmental Protection Regarding the Prevention and Control of Pollution to the Atmosphere, DOF 25-11-1988

- Regulation of the General Law on Climate Change, regarding the National Registry of Emissions, DOF 28-10-2014
- Regulation of the General Law on Ecological Balance and Environmental Protection Regarding the Register for Pollutants Release and Transfer, DOF 3-06-2004
- Regulation for the Protection of the Environment against Noise Pollution, DOF 6-12-1982
- Official Mexican Standard NOM-165-SEMARNAT-2013, which establishes a list of substances that must be reported to the Pollutant Release and Transfer Register, DOF 24-01-2014

Tax Laws

Tax legislation applicable to mining:

- Federal Law on Duties and Charges, DOF 31-12-1981; last amendment and update published in the DOF on November 11, 2021
- Law on Income Tax, DOF 11-12-2013

Other Applicable Regulations

Other regulations applicable to mining:

- Agrarian Law, DOF 26-02-1992
- Regulation of the Agrarian Law Regarding the Certification of Ejido Rights and Titles of House Lots, DOF 06-01-1993
- Law of the National Institute of Indigenous Peoples, DOF 4-12-2018
- Federal Law on Firearms and Explosives, DOF 11-01-1972
- Regulation of the Federal Law on Firearms and Explosives, DOF 6-05-1972
- Federal Labour Law, DOF 1-04-1970
- Federal Regulation on Health and Safety at Work, DOF 13-11-2014
- Mexican Standard NMX-R-025-SCFI-2015 on Labour Equality and Non-Discrimination, DOF 20-10-2015
- General Law for the Equality Between Women and Men, DOF 2-08-2006
- General Law on Women's Access to a Life Free of Violence, DOF 1-02-2007
- Regulation of the General Law on Women's Access to a Life Free of Violence, DOF 11-03-2008

TABLE 1. International agreements and commitments relevant to the mining sector

Category	Document	Ratification date
Human rights	Universal Declaration of Human Rights	
	American Convention on Human Rights (Pact of San José, Costa Rica – 1969)	1981
	International Covenant on Economic, Social and Cultural Rights	1981
	International Convention on the Elimination of All Forms of Discrimination Against Women	1981
	Convention on the Rights of the Child	1990
Environment – United Nations	Convention on International Trade in Endangered Species of Wild Fauna and Flora	1991
	Ramsar Convention	1986
	United Nations Framework Convention on Climate Change	1997
	Convention on Biological Diversity	1993
	United Nations Convention to Combat Desertification	1995
	Program for Reducing Emissions from Deforestation and Forest Degradation (REDD+)	2011
	Paris Agreement	2016
	Escazú Agreement	2020
Handling of hazardous chemicals	Basel Convention on the Control of Transboundary Movements of Hazardous Wastes	1991
	Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade	2005
	Stockholm Convention on Persistent Organic Pollutants	2003

Category	Document	Ratification date
International labour organization	Convention concerning Forced or Compulsory Labour	1934
	Underground Work (Women) Convention	1938
	Equal Remuneration Convention	1952
	Convention concerning the Application of the Principles of the Right to Organise and to Bargain Collectively	2018
	Convention concerning Discrimination in Respect of Employment and Occupation	1961
	Freedom of Association and Protection of the Right to Organise Convention	1950
	Convention Concerning Minimum Age for Admission to Employment	2015
	Worst Forms of Child Labour Convention	2000
	Convention No. 123 concerning the Minimum Age for Admission to Employment Underground in Mines	1968
	Convention No. 124 concerning Medical Examination of Young Persons for Fitness for Employment Underground in Mines	1968
	Convention No. 169 concerning Indigenous and Tribal Peoples in Independent Countries	1990
	Convention No. 170 concerning Safety in the use of Chemicals at Work	1992

In 2015, Mexico signed the Minamata Convention on Mercury and committed to eliminating the use of this substance in the country. Mexico is a member of the Extractive Industries Transparency Initiative (EITI). In 2017, Mexico was recognized as a candidate and in 2018 submitted its first report on cash flows corresponding to 2016. The second report was submitted in 2020, corresponding to the fiscal years 2017 and 2018. Mexico's validation process for the EITI Standard started on October 1, 2021.

Key Government Institutions

Ministry of Economy

Coordination Unit for Extractive Activity (Unidad de Coordinación de Actividades Extractivas [UCAE])

This coordination unit is part of the Ministry of Economy and is in charge of the mining sector. The UCAE was created in 2021 to coordinate all mining activities, with the support

of the General Directorate of Mines, the SGM, the Mining Development Trust (Fideicomiso de Fomento Minero [FIFOMI]), and the Exportadora de Sal company to address national and foreign investments, as well as to allocate revenues obtained from mining duties. The UCAE also proposes the development of tax schemes to leverage the sector.

General Directorate of Mines (Dirección General de Minas [DGM])

The DGM is in charge of applying the policy of exploitation and use of mining resources by granting mining concessions and special exploration rights (*"asignaciones"* in Spanish). The DGM also maintains the Public Mining Registry, in which all concessions and special exploration rights—as well as mining legal acts, contracts, or agreements entered into with natural or artificial persons—are recorded (Section 46 of the Mining Law.)

Mexican Geological Survey (SGM)

The SGM undertakes the exploration of the Mexican territory with the purpose of identifying and quantifying potential mineral resources in the country through special mining exploration rights. The SGM is also part of the Ministry of Economy and is vested with the following main functions (Section 9 of the Mining Law):

- Perform geological, mining, and metallurgic research to make better use of the country's mineral resources.
- Identify and estimate mineral resource endowments in the country.
- Inventory mineral deposits in the country.
- Provide the country's geological, geophysical, geochemical, and mining information to the public.
- Survey and update the Geological Map of Mexico, in the required scales.
- Provide technical assistance to small and medium operations in the mining sector and to the social sector for assessments of mineral deposits, metallurgical processes, and physical-chemical analysis of ore samples, for their beneficiation.

SEMARNAT

SEMARNAT is responsible for promoting the protection, restoration, conservation, preservation, and sustainable use of ecosystems, natural resources, and environmental assets and services, in order to ensure the right to a healthy, sound environment, in accordance with Article 4 of the Constitution. The SEMARNAT prepares, enforces, and assesses policies regarding natural resources, water, and environmental regulations on urban development and fishing activities.

Federal Attorney for Environmental Protection (Procuraduría Federal de Protección al Ambiente [PROFEPA])

PROFEPA is a decentralized agency of the SEMARNAT that is in charge of environmental monitoring, inspection, and verification. PROFEPA has the power to impose penalties on offenders who violate environmental legislation. In addition, PROFEPA can request compensation for damages, demand regularization processes to be performed, and order the total or partial shutdown of an operation.

National Institute of Ecology and Climate Change (Instituto Nacional de Ecología y Cambo Climático [INECC])

The INECC is a decentralized agency of SEMARNAT that is responsible for carrying out technical and scientific research on ecology and climate change to support decision making. The INECC was created with the enactment of the General Law on Climate Change.

National Water Commission (Comisión Nacional del Agua [CONAGUA])

The CONAGUA is a decentralized administrative agency of the SEMARNAT responsible for the preservartion and sustainable management of national water bodies and their inherent public assets and for ensuring water security according to the responsibilities granted by the government and society in general.

Ministry of Labour and Social Welfare (Secretaría del Trabajo y Previsión Social [STPS])

The STPS is responsible for preparing labour policies and enforcing labour regulations and rights. Among other functions, the STPS is also in charge of strengthening labour intermediation to improve productivity, labour conditions, and the quality of life of workers and their families.

Tax Administration Service

The Tax Administration Service is a decentralized administrative agency of the Ministry of Finance and Public Credit responsible for collecting tax revenues and customs duties established by law.

National Institute of Indigenous Peoples

The National Institute of Indigenous Peoples is the authority in charge of issues concerning Indigenous and Afro-Mexican peoples in order to ensure the exercise and implementation of their rights, integrated and sustainable development, and the strengthening of their cultures and identities.

According to the law, the National Institute of Indigenous Peoples is the technical entity involved in the processes of free, prior, and informed consent for any administrative and legislative decisions at the federal level that could have an impact on the rights of these communities.


Photo: Epitacio Robledo

5.0 Assessment: Mexico and the MPF

Theme I: Legal and Policy Environment

The first theme of the MPF is the general regulatory and policy environment regarding permitting processes aimed at promoting a modern and mature legislative system that advocates for clear liability and accountability. This set of regulations is the basis for good governance and sustainable development. The MPF recommendations regarding this theme are classified into the following categories:

- Generating ongoing geological information and ensuring equal access to this information.
- Regularly reviewing and updating mining legislation and policies.
- Establishing a permit process requiring
    - Consultation with communities in the planning and development stages
    - Submission of comprehensive (social, economic, and environmental) assessments
    - Identification of opportunities for sustainable development
    - A mine closure plan and financial insurance for mine closure
    - Consideration of Indigenous Peoples' rights and their cultural heritage, resettlement issues and the security of the community, as well as other security issues
    - An adequate, transparent, unequivocal, and uniform process.

Key Laws and Policies

- Mining Law
- Law Declaring Uranium and Thorium Deposits, and Other Substances from which Fissile Isotopes Capable of Producing Nuclear Energy Are Obtained, as National Mineral Reserves
- Agrarian Law
- Law of the National Institute of Indigenous Peoples

- Federal Law on Duties and Charges
- General Law on Ecological Balance and Environmental Protection
- Regulation of the Mining Law
- Regulation of the LGEEPA regarding Environmental Impact Assessment
- Regulation of the Agrarian Law regarding the Certification of Ejido Rights and Titles of Lots
- Guide to Submit the Mining Environmental Impact Statements: Specific Area (2002)
- Investor's Manual on the Mexican Mining Sector
- Public Service Manual on Mining (1999)
- Guide to Mining Legal Requirements (2008)
- Guide to Mining Procedures

Mining Permitting and Concession System

Concessions for the exploitation, use, and beneficiation of mineral resources can only be granted by the federal Executive Branch (Article 27 of the Constitution). The Mining Law establishes that the exploration and exploitation of minerals can only be carried out by Mexican nationals, ejidos and agricultural communities, Indigenous Peoples and communities, and corporations incorporated according to Mexican laws (Article 10).

The DGM is the agency in charge of granting mining concessions that confer upon the holders the right to explore, exploit, and process all the substances within the mining property subject to the concession. Concessions may last up to 50 years, with the possibility of being extended for another 50 years.

Mining concessions only confer rights on underground mineral resources. To carry out exploration and exploitation activities, concession holders must contact the landowners to obtain a legal instrument granting access to the surface land. Surface land can be either social (agrarian) property or private property.

If the surface land is considered social property, the Agrarian Law must be observed. The Agrarian Law regulates the three types of land tenures defined by the Constitution as social properties: ejido, communal, and small property. The purpose of establishing social properties was to distribute lands equally among the most disadvantaged population of post-revolutionary Mexico, including Indigenous Peoples. In the case of private property, civil law legislation must be observed.

Concessionaires may request a resolution from the Ministry of Economy or the Ministry of Agricultural, Territorial and Urban Development to obtain the expropriation, temporary occupation, or creation of easement on the land surface necessary to carry out their activities. However, until today, concessionaires have rarely used this resource.

In addition to concessions, the Mining Law refers to special exploration concessions (asignaciones, as defined in Section 9) also granted by the DGM exclusively to the SGM. Special exploration concessions are only issued to carry out mining exploration on the national territory with the purpose of identifying and estimating the mineral resources endowment of the country. Special exploration concessions last 6 years without the possibility of being extended. After this time, mining concessions can be granted through a bid.

TABLE 2. Legal instruments of the mining system

	Mining concession	**Special exploration concession *(asignación)***
Granted to	Mexican individuals, *ejidos* and agricultural communities, Indigenous Peoples and communities, corporations incorporated according to Mexican laws	Mexican Geological Survey
Rights granted	Exploration, exploitation, and beneficiation of minerals and substances listed in Section 4 of the Mining Law.	Exploration of minerals and substances listed in Section 4 of the Mining Law.
Term	50 years, with the possibility of being extended for another 50 years.	6 years without the possibility of being extended.
Granting procedure	Application before the DGM. Through a bidding process upon the 6 years of a special exploration concession granted to the SGM.	DGM

Concessions will not be granted for radioactive minerals. Therefore, only the Mexican nation has the right to use and exploit radioactive materials.

System of Environmental Licences and Permits

Environmental policy instruments established by the LGEEPA and related to extractive activities such as mining are the following:

- Environmental national planning
- Ecological land-use zoning
- Economic instruments
- Environmental regulations on human settlements
- Environmental impact assessments (EIAs)
- NOM on environmental issues
- Self-regulation and environmental audits
- Ecological research and education

EIAs are governed by the LGEEPA and its regulation concerning EIAs.

An EIA is a mandatory environmental policy instrument to start works and activities that may cause negative impacts on the environment. For the mining sector, the EIA is defined (Section 28 of the Mining Law) as the process through which SEMARNAT establishes the terms and conditions that the exploration, exploitation, and beneficiation of minerals are subject to. When the mining project under assessment comprises high-risk activities, the EIA must include a risk analysis. A guide to submitting an environmental impact statement (EIS) is available on the SEMARNAT website.

Works and activities subject to the EIA, as well as the exceptions, are specified in the Regulation of the LGEEPA regarding Environmental Impact (Section 5, Subsection L).

TABLE 3. Works and activities subject to EIA

Work or activity	Description	Excluded
Exploration	Mining exploration works	Gravimetric, surface geological, geoelectric, magneto telluric, magnetic susceptibility, and density prospecting surveys, as well as drilling, trenching, and rock exposure works, when carried out in agricultural, stockbreeding, or wasteland areas and in areas with dry and temperate climates where xerophile shrublands, tropical deciduous forest, coniferous forest, or holm oak are located outside natural protected areas.
Exploitation	Works for the exploitation of minerals and substances under the dominion of the federation, including its supporting infrastructure	
Beneficiation of minerals	Beneficiation of minerals and final disposal of waste in tailings dams	Processing plants that do not use hazardous substances and hydraulic backfills from underground mining works.

Sixty days after receiving the EIA report, SEMARNAT will approve the project, reject it or, if appropriate, approve it under certain terms and conditions. During the last 2 years, this period of time has not been observed.

SEMARNAT may require insurance or financial assurances to ensure compliance with the terms and conditions established in the authorization whenever serious damage to the ecosystems could occur (Section 35 of the Mining Law), such as, for example, when high-risk activities are performed or when activities are carried out in protected natural areas (Section 51 of the Regulation). SEMARNAT will set the amount for the insurance and financial assurances, which should be updated annually according to the restoration costs for the damage that could be the result of a breach of the terms and conditions established in the

authorizations. Insurance or financial assurances may be established for every stage of the project.

In the case of forest lands, authorization for a land-use change should be obtained from SEMARNAT whenever a non-forest activity is carried out. To obtain such authorization, the proponent must carry out and submit a supporting technical study. The authorization granted should include a rescue and relocation program for the affected flora and fauna, and subsequent adaptation to a new habitat, in accordance with the Regulation of the General Law of Sustainable Forestry Development. The proponent of the land-use change shall also pay a fee to the Mexican Forest Fund as environmental compensation so that restoration activities for the affected ecosystems can be carried out (Section 98 of the Regulation of the General Law of Sustainable Forestry Development).

Regular Reports

In accordance with the Mining Law, concession holders should submit the reports listed in Table 4.

TABLE 4. Mandatory reports for concession holders

Type of report	Frequency	Authority involved	Legal basis
Verification of site and works	Yearly each May starting 90 days after the concession has been registered in the Public Mining Registry.	DGM	Para. I of Sections 27, 28, and 29 of the Mining Law; Sections 59, 60, 61, 62, 63, 65, and 66 of the Regulation of the Mining Law.
Statistics report on the production, beneficiation, and purpose of minerals or substances subject to concession	From the seventh year of the the concession was granted, you have 30 days to submit the report. This report must be submitted annually.	DGM	Para. VII of Section 27 of the Mining Law; Section 70 of the Regulation.
Accounting report	Only if required by the Ministry of Economy.	DGM	Para. VII of Section 27 of the Mining Law; Section 69 of the Regulation.
Technical report	Within the 30 days immediately after closure of the sixth year of the effective date of concession (i.e., submitted only once during the term of the concession).	DGM	Para. VII of Section 27 of the Mining Law.

Type of report	Frequency	Authority involved	Legal basis
Mining geological report	Once the mining concession expires, or there is a mandatory reduction or lack of interest in an area of the concession, or when a penalty is imposed, or a court resolution is issued. This report describes the exploration and exploitation works that will be carried out on the mining property.	DGM, in turn, submits the report to the SGM to be included in the public information system.	Fr. IX artículo 27, 35 Bis de la Ley Minera; artículos 7, 44, 71 y 72 del Reglamento.
Work and production report in the case of concessions granted through a bid	Semi-annual reports in January and July.	SGM for the payment of the discovery fee (royalty).	Para. X of Section 27 of the Mining Law; Sections 71 and 72 of the Regulation.

The SGM, as holder of special exploration concessions *(asignaciones)*, must submit the public reports listed in Table 5.

TABLE 5. Reports by the SGM

Type of report	Frequency	Authority involved	Legal basis
Report on the results obtained on the special exploration concessions	120 days before the expiration of the concession.	DGM	Artículo 36 de la Ley Minera; artículo 73 del Reglamento.
Work report	Once a year, within the 30 days immediately after the end of the January-to-December reporting period for the previous year.	DGM	Section 36 of the Mining Law; Section 73 of the Regulation.

Concessionaires shall inform the starting date of the beneficiation operations (Section 37 of the Mining Law and Section 67 of the Regulation of the Mining Law).

Environmental Audits

Environmental audits are voluntary processes that mining companies undergo to improve their environmental performance, committing themselves to exceed the requirements established by environmental protection regulations. The auditing process is carried out before PROFEPA, where a mining operation may apply to obtain a Clean Industry Certificate. The audit review process lasts about 2 years, and, during this term, the operation shall perform changes and adjustments in the equipment to environmentally improve its beneficiation processes. The whole auditing process becomes official through the execution of an agreement governed by the LGEEPA Regulation regarding Self-Regulation and Environmental Audits.

The Environmental Excellence Award is another reward granted by PROFEPA to distinguish those companies which, after achieving the highest level of environmental performance, continue carrying out outstanding actions to protect the environment (Section 31).

Public Information and Consultation Procedures

As part of the EIA process, SEMARNAT makes the EIS publicly available. In addition, LGEEPA and its Regulation regarding Environmental Impact establish the possibility of carrying out a public consultation procedure at the request of any member of the affected community.

The proponents of a mining work or activity may request commercial information, as well as any information that could affect industrial property rights, to be considered confidential information. Every week, SEMARNAT publishes the list of projects received for the EIA process in *Gaceta Ecológica* (SEMARNAT, n.d.).

FIGURE 10. EIA public information procedure

Public information	Public consultation procedure	Public information meeting within the public consultation procedure
• Once the EIS has been received, SEMARNAT makes it publicly available at its central offices and at the local state offices where the mining work or activity will be carried out.	• Any member of the affected community may request a public consultation procedure. The term for the public consultation request is 10 days from the publication of the lists of EISs in the Gaceta Ecológica. • The proponent shall also publish, at its own expense, an abstract of the project in a mass circulation newspaper of the hosting state.	• In the case of mining works or activities which include high-risk activities, SEMARNAT may schedule, together with local authorities, a public information meeting in which the proponent will explain the environmental technical aspects of the proposed mining work or activity.

Source: Authors.

SEMARNAT must incorporate the observations and proposals of the interested parties in the authorization granted.

Strengths

Comprehensive geological information is accessible to the public.

As part of the Ministry of Economy, the SGM is possibly one of the most comprehensive geological services in Latin America. Geological information about the Mexican territory is available in mapping scales of 1: 250,000 and 1: 50,000. The first geological information dates back to the 1900s, and this information is now digitally captured.

Information is also available to the general public on the SGM website, and it can be downloaded in PDF. GeoInfoMex, a platform providing geological information, has 92 layers of data collected during over 7 decades of mining exploration, including geological maps, mining, and infrastructure maps, as well as maps on natural and archaeological areas, land use, vegetation, geophysics, and *ejidos,* among others. The SGM has agreements with different governmental entities to keep the information up to date. The Mexican mining statistical yearbook is published every year, with information about the 43 mineral substances produced in Mexico.

However, even though Mexico's geological survey is a comparatively good service, complaints have been raised regarding information access and the lack of updated data.

Mining concession holders submit production and investment reports to help the DGM in decision making.

Mining companies must submit several reports that help the DGM make better decisions based on updated mining activity information. These reports include:

- Verification of works, including investments, expenses, and construction, among others.
- Statistics regarding production, beneficiation, and the destination of minerals or substances subject to concessions.
- Accounting data.
- Technical information.

The requirements for each report can be found in the Regulation of the Mining Law, and forms are available through the DGM website.

The DGM's registry digitalization initiative for mining concessions will improve efficiency.

Over the years, and given the number of applications, there has been a delay in answers to pending mining concessions. However, the DGM is currently working on digitizing documents and making changes to the Regulation of the Mining Law, among others, to set up a web platform through which the proponents may perform the different mining concession procedures and submit the mandatory reports and the corresponding certificates to the Public Mining Registry.

With this digital strategy, answers to proponents are expected to be faster and within the period established by law.

Issues related to cultural heritage are considered in the EIS.

In the EIS, SEMARNAT requests information regarding cultural heritage (Subsection IV.2.4, b – *Guide to Submit the Mining Environmental Impact Statement: Specific Area*) and is entitled to request more information in addition to what the proponent submitted.

Economic and social factors are considered in the EIS.

Although the LGEEPA and its regulation do not explicitly establish that the EIS must include social considerations, the *Guide to Submit the Mining Environmental Impact Statement: Specific Area* in Subsection IV.2, Description and Analysis of the Environmental System, establishes that: "all elements of the physical, biotic, social, economic and cultural environment" should be considered in a comprehensive manner. Subsection IV.2.4 specifies the requirements that an EIS must include social and economic aspects, which are, in turn, divided into demographic and socio-cultural factors.

Further on, in Subsection V, Identification, Description and Assessment of Environmental Impacts, the guide requires proponents to consider impacts on certain demographic (including population, employment, and immigration, among others) and socio-cultural (changes to artistic, historical, and cultural heritage) aspects.

Human resources in the Ministry of Economy are qualified to implement laws and policies.

Within the different departments of the Ministry of Economy, the officials in charge of the mining sector have experience and academic backgrounds in mining, including geology and mining engineering studies, and there are subject matter experts in hydrology and environmental issues as needed.

Weaknesses

The law is outdated and does not reflect best practices. There is a lack of regulations.

The Mining Law is outdated and does not reflect current best practices. This law is from 1992, and it has been amended several times (the most important amendments were adopted in 2005 and 2014). However, these amendments have not brought significant changes as compared to international best practices. Key aspects that need improvement in the current law are:

- Consideration of the social impacts of the approval of exploration and exploitation activities. At present, social aspects are only identified in the EIS—they are not assessed.
- Consideration of community or Indigenous consultation procedures.
- Consideration of mine site closure and post-mining stages.
- Further consideration to small-scale or artisanal mining.

Regarding regulations, certain guidelines must be issued to align the coexistence of mining activities with energy industry activities carried out.

Comprehensive social, economic, and environmental assessments are not required, and opportunities or benefit programs are not identified or quantified throughout the life of the project.

Although the *Guide to Submit the Mining Environmental Impact Statement: Specific Area* demands a socio-economic assessment, comprehensive social, economic, and environmental assessments are not required. This is also the case for the hydrocarbon industry, where the Ministry of Energy is in charge of socio-economic assessments. SEMARNAT is not entitled to perform social or economic assessments. Given that the Ministry of Economy only analyzes assessments before starting exploration activities (and not before exploitation activities), it is not entitled to assess social or economic issues.

There are no cases in which the government has identified opportunities or socio-economic or environmental benefit programs throughout the life of the mining project.

There is no policy in place for the development of the mining sector, nor is the mining sector considered in the national agenda.

The government manages the mining sector without a clear policy to guide its development. Unlike previous development plans, the Mexican National Development Plan for 2019–2024 (July 2019) does not include the domestic mining industry. The Ministry of Economy—in this case, the relevant department—has not yet defined a mining program, despite having the power to formulate and carry out the mining policy under the Organic Law of the Federal Public Administration, paragraph XXVII, Section 34, and despite the express mandate to do so established by the Planning Law, which states that the National Development Plan shall establish the institutional, regional, special, and industry-specific programs that the relevant departments should prepare.

A program for the mining industry helps the public administration to perform its duties by specifying the goals, priorities, and policies that will govern the performance of the activities of the relevant administrative sector. Through these programs, necessary resources can be calculated, instruments can be created, and people in charge of executing them can be assigned (Section 22 Planning Law).

The government lacks a nationwide mining perspective, generating uncertainty regarding whether there is an interest or not in developing this type of activity and how to do it.

Concession procedures do not distinguish between exploration and exploitation rights.

Mining concessions include the right to explore and exploit minerals. The Mining Law merged both types of activities with the amendment of 2005, mainly to simplify the administrative workload due to delays in mining procedures at the time.

As a result of this merger:

- The DGM cannot thoroughly analyze exploitation activities in such early stages.
- This affects community and Indigenous consultation procedures, as it implies carrying out the consultation during the exploration stage with no certainty as to whether an operation will eventually be developed or not. In addition, it is contrary to the international obligations assumed by the government for consultation with Indigenous communities before making any decisions that may have an impact on them.
- The DGM does not have information on the exact time period in which exploration operations end and exploitation operations begin.

As a result, the government cannot adequately plan mining activities.

There is a lack of government personnel due to austerity.

Given the current austerity policies, different governmental departments lack enough personnel to develop and oversee the mining industry in the country. In the past, the Ministry of Economy had delegations in each state, but since 2019, the budget has been reduced to 10% of its former amount. In addition, the delay in the delivery of information is due, in part, to the lack of personnel necessary to process the data, which affects transparency.

The Ministry of Economy cannot allocate 5% of the mining revenue to strengthen its structure, as established by the Federal Law on Duties, and sometimes this revenue is sent back to the Ministry of Finance.

Community or Indigenous consultation procedures are not carried out proactively. Communities have difficulties understanding EIAs.

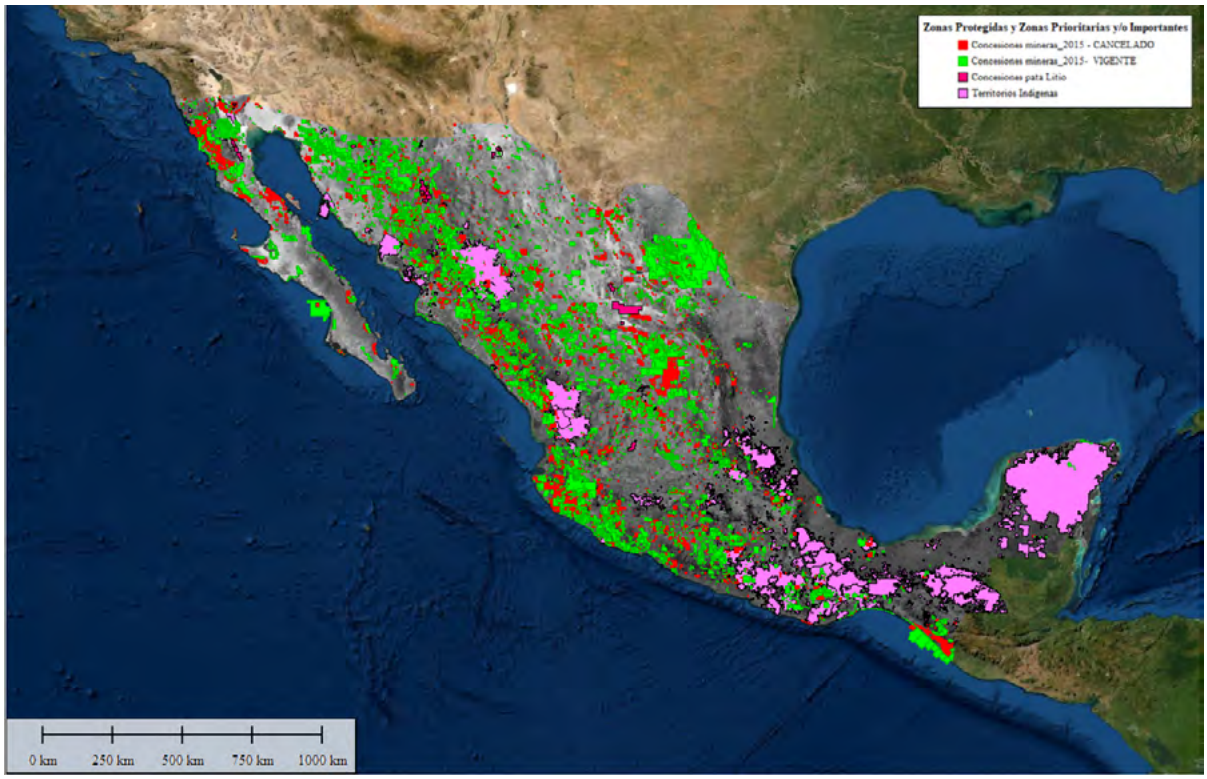
According to the Mining Law, consultation procedures with communities or any other stakeholders are not mandatory as a prerequisite to any assessment and planning processes. Community engagement in mining projects is included in the EIA procedure. Such a consultation procedure must be carried out at the request of any member of the community, based on the information the company made available to the public in SEMARNAT offices and in the Gaceta Ecológica. This process is not proactive from the company or the government.

The EISs are not published consistently (NRGI, 2021), which makes it difficult for citizens to have the necessary information for an adequate consultation procedure.

According to the amendment made to Section 93 of the General Law of Sustainable Forestry Development on April 26, 2021, a prior, free, informed, and culturally adequate consultation procedure must be carried out in good faith, pursuant to the applicable law, to approve any change of land use in the case of lands located in Indigenous territories.

Court decisions have forced Mexican authorities to carry out Indigenous consultation procedures before concession administrative acts. Up to now, Indigenous consultation procedures have not been carried out for mining projects. However, there have been cases in which the constitutionality of the Mining Law has been challenged for not including Indigenous consultation procedures. The issue of Indigenous consultation is relevant since many mining concessions are granted in areas where Indigenous communities live, as shown in the map in Figure 11.

FIGURE 11. Indigenous territories and mining concessions map



Source: Map drawn by the authors based on CartoMinMex – Information System for the Mexican Ecological Zoning Plan (2021).

Sometimes, when consultation procedures are carried out, communities cannot understand the technical terms of the information published.

In mining permitting, there is no requirement to address Indigenous Peoples' issues, resettlement, or security issues.

The legislation and the policies do not explicitly address issues related to Indigenous Peoples, resettlement, or security issues before the project approval is issued. In general, the *Guide to Submit the Mining Environmental Impact Statement: Specific Area* recommends including socio-cultural factors in the EIS.

Approvals are not promptly issued or clearly or consistently processed due to a lack of coordination between governmental agencies.

There is a lack of communication among the different ministries (Ministry of Economy, SEMARNAT, Ministry of Labour, and Ministry of Energy). These agencies have no information on when other agencies issue any approvals or when companies are either in compliance with the regulations or penalized. Some companies take advantage of this lack of coordination.

There is legal and political uncertainty around investing.

According to the Fraser Institute, "Mexico's investment attractiveness has significantly deteriorated in the last 10 years" (CAMIMEX, 2021). A number of governmental actions have created a feeling of legal and political uncertainty in investing in and maintaining operations in the Mexican mining sector:

- **Inconsistency in issuing concessions and permits:** Since 2019, a de facto moratorium has been established on mining concessions in Mexico. Under a decision by the Executive Power, the government is currently not issuing new concessions. Current concessions are still in force, but the estimated time for approval and the possibility of obtaining approval for an extension or environmental permits are either denied or not taken into consideration. Despite having a clear regulation on permits and concessions, enforcement is uncertain. In addition, although there are laws in force, in some cases, the applicable authority does not enforce them—for example, due to community resistance. This is the case of the Real de Ángeles mine, in which the community does not support the closure plan, and therefore the mine has stopped operations, and closure is still pending. In San José del Progreso, Oaxaca, there is another large-scale operation for which an extension request was submitted to SEMARNAT with no answer from the authority. As a result, the operation has been shut down. Around the same time, the Federal Audit Office warned the Ministry of Economy for not processing applications. This situation hinders the development of the mining sector.
- **Arbitration in the mining sector:** Several international arbitration proceedings against the Mexican government related to mining are in progress or likely to begin—such as the arbitration procedures requested by several mining companies, including First Majestic Silver, Odyssey Marine, or Legacy Vulcan—due to actions or omissions by the government. Some of the underlying issues that gave rise to these arbitration proceedings are tax disputes, operation blockades, and the lack of answers to or no grounds for rejections of environmental permits.
- **Institutional changes detrimental to the mining industry:** In 2020, as part of the changes implemented under austerity policies, the Undersecretariat of Mining was dismantled and the administrative body ruling the mining industry was downgraded to a simple "unit." Along with budget cuts and personnel reduction, these changes show that the government assigns low importance to the mining industry.
- **Reduction of investment incentives in the mining industry:** Deductions for capital investments in exploration have been deferred for 10 years. In the past, deductions for capital investment in exploration were allowed and paid back during the fiscal year of the expense. This was an incentive to invest in Mexico. Since 2014, such incentives have been limited to deductions of 10% a year on a 10-year prorated basis, discouraging investments in exploration, which have fallen by 60%. That same year, pursuant to the Federal Law of Duties (Ley Federal de Derechos [LFD]), two additional charges were included: the special mining duty and the extraordinary mining duty.
- **A lack of governmental action on mining conflicts and uncertainty:** Companies operating in Mexico have expressed concerns regarding blockades and uncertainty when it comes to carrying out operations. The Mexican government has adopted a reactive approach rather than a preventive approach (for example, by performing prior consultation procedures at the early stages of the mining life cycle) in relation to local conflicts. Certain mining operations are obligated to comply with operation hours and pay for additional security systems and staff. These decisions are adopted for security reasons due to the presence of operators carrying out illegal activities around or near the mining sites.

Conflicts have arisen between the mining industry and the agrarian and energy sectors.

In some cases, mining concession holders have difficulties accessing the mining lots under concession due to disputes on the ownership of *ejidal* property or due to the lack of information from *ejido* members on the agreements entered into between the mining companies and the Ejido Commissariat.

Section 6 of the Mining Law assigns pre-eminence to the energy industry if mining concessions and energy permits coexist. However, since the law does not mandate any regulation guidelines, the DGM is currently forced to examine if there are any conflicts related to the coexistence of mining concessions and energy projects, which ultimately delays the final step in the concession process.

The EISs are not always disclosed.

In accordance with the LGEEPA, SEMARNAT must publish the EISs submitted by companies (Section 34). In practice, this disclosure is not implemented, and, as a result, citizens do not have the information available to assess the environmental and social impacts of the proposed mining operations (NRGI, 2021).

Theme II: Optimization of Financial Benefits

The second theme of the MPF refers to the financial optimization of mining activities through taxes and royalties, reflecting the value that mineral resources have for society. Another main issue in this section is the transparency of revenues at the municipal and national levels, as well as the allocation of these incomes in the local development of mining-affected areas. Policy recommendations regarding this theme are classified according to the following categories:

- Implementing a framework for revenue generation that optimizes the benefits from mining activities and allows a minimum rate of financial return during low mineral price periods.
- Integrating mining sector planning with other economic sectors.
- Promoting a policy that optimizes revenues and, at the same time, offers an adequate rate of return to investors through an income tax based on net profits and applies these taxes similarly to non-mining activities.
- Allocating a high level of human and intellectual resources, specifically for managing and monitoring Mexico's fiscal system and maximizing benefits.
- Integrating fiscal instruments into political goals.
- Increasing transparency on revenues and disclosure of information regarding the allocation of mining benefits.

Key Laws and Policies

- Federal Law on Duties
- Law on Income Tax
- Mining Law

Mining Fiscal System

According to the Mining Law, taxes levied on mining activities shall only be established through a Federal Law (Section 6). The LFD establishes two activities levied:

- For using or exploiting goods considered to be in the public domain of the nation, such as minerals.
- For services provided by the government, such as the studies and analysis carried out by governmental agencies to grant permits, concessions, or authorizations. For each application for a mining concession or a special exploration concession, the duties that result from applying a fee to the number of hectares that the concession application intends to cover will be paid based on the breakdown in Table 6 (Section 63):

TABLE 6. Application fee estimate based on the number of hectares that the concession intends to cover

Limits (Hectares)		Fixed fee (MXN)	Additional fee per hectare exceeding the lower limit (MXN)
Lower	Upper		
1	30	700.95	11.40
31	100	1,061.42	21.18
101	500	2,602.48	51.53
501	1000	24,299.87	67.14
1001	5000	67,686.76	4.0661
5001	50 000	85,913.80	2.9146
50 001	Higher	217,817.46	2.6877

Source: Ley Federal de Derechos, 1981.

The LFD also sets duty payments for analyzing and processing the applications related to the exercise of rights, acts, contracts, or agreements covered under the Mining Law, some of which must be registered in the Public Mining Registry, as well as for requesting for official mining maps to the Mexican Geological Survey (Sections 64, 65, and 66).

According to the LFD, payment must be made for exploiting salt flats for salt production. This duty will be estimated by multiplying the amount of MXN 2,464 per tonne of salt or its by-products sold. Holders of mining concessions must pay the following duties for the use and beneficiation of minerals in accordance with the LFD.

a. Mining Duties (Section 263)

Mining concessionaires shall pay mining duties every six months per hectare or fraction thereof under a mining concession or special exploration concession according to the fees listed in Table 7.

TABLE 7. Fee per hectare according to the duration of the concession

Mining concessions and special exploration concessions	Fee per hectare (MXN)
I. During the first and second years of concession	8.04
II. During the third and fourth years of concession	12.02
III. During the fifth and sixth years of concession	24.85
IV. During the seventh and eighth years of concession	49.98
V. During the ninth and tenth years of concession	99.95
VI. From the eleventh year of concession onward	175.90

The Ministry of Finance also collects new taxes established under the tax reform adopted in 2014, which added three new duties—a "special duty," "additional duty," and "extraordinary duty"—applicable to mining activities (CAMIMEX, 2021).

b. Special Mining Duty (Section 268)

Concessionaires generating incomes as a result of sales from mining activities shall pay the special mining duty annually. A 7.5% rate is applied to cumulative income as per income tax law.

Deductions authorized in accordance with the Law on Income Tax (Ley de Impeusto Sobre la Renta [LISR]), such as investments in mining research and exploration or any such other activity, can be applied to determine the basis of this tax.

c. Additional Mining Duty (Section 269)

Holders of mining concessions who do not carry out exploration or exploitation works for 2 consecutive years shall pay the "additional mining duty" in January and July according to the criteria outlined in Table 8.

TABLE 8. Percentages of the additional mining duty

Concession period	Fee % of the mining duty (Section 263)
During the first 11 years of the concession	50%
During and after the 12th year of the concession	100%

Source: Ley Federal de Derechos, 1981.

The payment of this duty shall continue until exploration and exploitation works are carried out for 2 consecutive years and proof of such work is submitted to the DGM.

d. Extraordinary Duty (Section 270)

Concession holders shall pay the extraordinary mining duty annually, applying a 0.5% rate to income resulting from gold, silver, and platinum sales. This percentage is added to the 7.5% rate of the mining special duty. As a result, a total rate of 8% is applied to the sale of gold, silver, and platinum.

TABLE 9. Summary of duties paid by the mining concessionaire

Name	Scope of application	Frequency and payment
a. MINING DUTY Section 263 (LFD)	Payment per hectare or fraction covered by the concession or allotment (see Table 7).	Semi-annual payment in January and July
b. SPECIAL MINING DUTY Section 268 (LFD)	A 7.5% rate is applied to cumulative corporate income resulting from the sales of extractive activities.	The last business day of March of the year following the levied year.
c. ADDITIONAL MINING DUTY Section 269 LFD	Upon verification that no exploration or exploitation works have been carried out for 2 consecutive years, during the first 11 years of validity of the mining concession, holders shall pay a fee equivalent to $87.95.	Semi-annual payment in January and July
d. EXTRAORDINARY DUTY Section 270 (LFD)	A 0.5% rate is applied to the income resulting from gold, silver, and platinum sales.	The last business day of March of the year following the levied year.

Source: Ley Federal de Derechos, 1981.

In addition, concessionaires shall pay:

1. An income tax levied on the income applied to corporate net income. This tax, paid by any company operating in Mexico, is collected through monthly estimated payments made to the Tax Administration Service. A 30% income tax rate is applied to companies (Section 9 of the LISR).
2. A 10% rate for employee profit sharing.

The mining industry can amortize 10% per year (Section 33 of the LISR) on the expenses incurred during a mine's pre-operation periods, mainly related to exploration and location activities and an estimate of new mineral deposits for exploitation. This rate is applicable to any industry for the expenses incurred in any preoperative stage (Section 33 of the LISR). A 12% depreciation rate shall be applied annually to machinery and equipment (Section 35 of the LISR). A 5% depreciation rate shall be applied to mining construction projects (Section 34

of the LISR). The value-added tax rate shall be 0% for exports, although this is not exclusive to the mining industry (Section 29 of the Law on Value-Added Tax).

Transparency

The government must disclose its sources of revenue in accordance with the law (Article 74 of the Constitution, Sections 46 and 53 of the General Law on Government Accounting, and Section 12 of the Law on Federal Budget), including sources of revenue from the mining sector.

Strengths

The same tax regime is applied to mining and non-mining industries.

In addition to the payments established in the Federal Law on Duties, there is an income tax applied to every Mexican corporation. This makes the management of commercial mining easier.

There are also specific amortization and deduction rates for expenses incurred in the purchase of machinery and equipment (12%) and mine site construction (5%). The amortization rate for preoperation expenses is 10%, but it is also applicable to any industry incurring preoperative expenses, including the mining industry.

Mexico has adopted the EITI.

In 2017, Mexico was admitted as a candidate, and in 2018 Mexico submitted the first report on cash flows from 2016. The second report was submitted in 2020, for the fiscal years 2017 and 2018.

Mexico is still moving forward with the process as a candidate since the validation process before EITI Mexico, which was scheduled for the reporting year, was eventually postponed due to the pandemic. The update on the requirements of the EITI Standard has included new issues in the work agenda of the National Multi-Stakeholder Group (involving the government, companies, civil society, and universities), such as socio-environmental flows, gender equality, and the disclosure of real beneficial owners, which were addressed throughout the year to be included in the 2019 report.

The EITI Mexico official website was launched, and other parties, such as states and municipalities carrying out extractive activities, joined the EITI process. This website has not been updated since 2019.

There are regulations on transfer pricing, and the government monitors best practices to spur national goals.

Mexico has been a member of the OECD since 1994. The Mexican government is permanently updating its legislation to implement international guidelines, such as the actions recommended by the OECD regarding tax base erosion and profit shifting and the Arm's Length Principle, among others. For instance, through an amendment made to the LISR, the Mexican government imposed a new obligation on taxpayers earning incomes of about MXN 644 million or higher, which compels them to file three annual reports: one on related parties of the local business group, another on related parties, and a country-by-country report of the multinational business group.

Tax collection is optimized during high-price periods, and the risk of closing or interrupting activities during low-price periods is reduced.

Mexico optimizes tax collection during high-price periods, and the risk of closing or interrupting activities during low-price periods is reduced due to the design of income tax and the special mining duty.

Weaknesses

Regarding revenue allocation, mining cash flows do not reach mining communities or the mining authority.

In accordance with the LFD, revenues are currently allocated based on the following criteria:

- 85% of revenues collected by the government from the special, additional, and extraordinary mining duties (Sections 268, 269, and 270 of the LFD) is assigned to the Ministry of Public Education and the Ministry of Health. Revenues are not necessarily allocated to the communities near mining operations. In the past, 80% of the resources were allocated to mining states and municipalities.
- The Ministry of Economy is allocated 5% of the revenues to strengthen the mining sector and improve the record and control systems of mining activities. However, the Ministry of Economy is not currently receiving this percentage.
- The remaining 10% is directed to the federal government for infrastructure programs that are not exclusively devoted to mining.

The revenues produced by mining activities do not reach the communities near the operations, thus creating social unrest regarding mining due to omissions on the LFD. Companies have become the main investors in basic services for the mining communities. Meanwhile, the mining authority is not receiving the 5% assigned to the Ministry of Economy due to a lack of enforcement of the law.

The Mining Fund aimed to improve the quality of life of populations near mining extraction areas. It consolidated the revenues of mining activities and assigned them to the states and municipalities where mining was performed. This fund—a direct mechanism for transferring mining revenues to municipalities—was dissolved in November 2020 by decree. The revenues collected between the fiscal years 2015 and 2019 corresponding to mining states and municipalities have not yet been paid. For instance, the Mining Fund still owes the municipality of Cananea, State of Sonora, approximately MXN 30 million corresponding to 2018.

The current mining federalism affected the reception of revenues corresponding to the mining municipalities that have performed local investments. Currently, only companies invest in mining communities.

The LGEEPA allows the possibility of generating economic incentives, but there is no regulation to implement such incentives or, if in place, it has been disputed.

The LGEEPA includes economic instruments (Sections 21 and 22). Economic instruments aim to achieve the goals set up by environmental policy, such as environmental protection, sustainable development, restoration of ecological balance, and the promotion of social equality, among others. These instruments may comprise economic, regulatory, administrative, fiscal, financial, and market mechanisms. Economic instruments require a regulation that has either not been developed or has been brought to court.

In 2016, the State of Zacatecas imposed four ecological taxes, which were mainly intended for mining extractions and beneficiation to address mining-related environmental issues in accordance with the LGEEPA and the General Law of Climate Change (Ley Federal de Cambio Climático). Several companies filed actions for the protection of their constitutional rights, and the federal government itself filed an appeal of unconstitutionality against the collection of such taxes for considering these taxes a federal matter. Some companies obtained favourable results.

There is a lack of transparency regarding the payments made by the companies to the government at a project level.

The government discloses consolidated information regarding the payments made by extractive companies. However, there is a lack of transparency for more detailed information at a project level (NRGI, 2021).

Theme III: Socio-Economic Benefit Optimization

The third theme of the MPF aims to promote the conversion of the natural capital extracted into other forms of capital—including especially, human capital—by fostering policies for the optimization of the socio-economic benefits derived from mining activities in favour of local, regional, and national stakeholders. Policy recommendations on this theme are grouped as follows:

- Integrate the mining industry into community, regional, and national structures and strategies by making, for example, socio-economic planning part of the permit process and by ensuring consultation procedures with the affected stakeholders throughout the different stages of the mining cycle.
- Ensure that mining activities consider and support education and health services in the community by working together with governments.
- Ensure adequate occupational safety and health levels through appropriate regulations.
- Optimize job and business opportunities in and outside the mine site to ensure economic growth beyond the life of the mine.
- Address potential safety problems.
- Take into consideration respect for human rights and the rights of Indigenous Peoples and their cultural heritage through regulations aligned with international laws and regulations.

Key Laws and Policies

- Mining Law
- Federal Law on Firearms and Explosives
- Federal Labour Law
- General Law for the Equality Between Women and Men
- General Law on Women's Access to a Life Free of Violence
- Law of the National Institute of Indigenous Peoples

- Regulation of the Federal Law on Firearms and Explosives
- Federal Regulation of Health and Safety at Work
- Regulation of the General Law on Women's Access to a Life Free of Violence
- Law on Underground and Opencast mines – Health and Safety Conditions at Work
- Law on Underground Coal Mines Safety
- Law on Labour Equality and Non-Discrimination

Strengths

Mining activities are embedded in the local and regional structures through clusters and associations.

Mining clusters are useful tools for making mining an engine for regional development. Mining clusters are made up of mining companies, mining suppliers, professional and technical education institutions, and state universities. The federal government is involved in cluster councils.

Clusters, among others, promote the standardization of mining safety and environmental care, both for service providers and for companies. These clusters promote projects for integrating the communities with mining projects.

In Mexico, there are mining clusters in the states of Zacatecas, Sonora, Chihuahua, Sinaloa, and Guerrero.

Along with the private sector, the government supports the education and training of mining professionals and meeting demand through public universities.

In Mexico, most universities offering Earth sciences as a course of study are public universities. About 53 public institutions offer education programs on Earth sciences for 20,000 students (CAMIMEX, 2021). This shows that the government is interested in training mining professionals.

At the same time, the private sector is looking at updating the curricula of the courses of study related to mining through clusters to meet the current demand.

Prohibition of child labour.

There are specific regulations on the prohibition of child labour (Section 23 of the Federal Labour Law), according to which "when labour authorities identify a child under the age of fifteen years-old working outside the family, the child shall immediately cease working" and "the employer shall be penalized."

There are regulations on labour equality.

Gender equality is considered in the legislation applicable to mining and in the efforts put into practice by the Mexican private sector. In 1974, the Congress of the Union enacted the amendment to Article 4 of the Constitution, according to which there shall be legal equality between women and men. In 2006, the Law for the Equality Between Women and Men was adopted, which regulates and ensures equal treatment and opportunities between women and men, established institutional guidelines and mechanisms to comply with this law in the public

and private sectors, and promotes women's empowerment and the fight against sex-based discrimination (Article 1).

In addition, the General Law on Women's Access to a Life Free of Violence was adopted in 2008 under law number DOF 1-02-2007, including its regulation. This law aims to ensure women's access to a life free of violence to promote their development and well-being in accordance with the principles of equality and non-discrimination. This law establishes coordination mechanisms and assigns competencies among the federation, the states, and the municipalities to prevent, punish, and eradicate violence against women. It also classifies different types of violence into physical, psychological, patrimonial, economic, and sexual violence. In addition, the law defines different forms of violence that may occur in the workplace, within the family, in teaching environments, or in community, institutional, and political contexts.

Moreover, the Constitution recognizes the right to obtain equal pay for equal work, with no differences for sex (Article 123). In accordance with the Law on Labour Equality and Non-Discrimination, a certification may be granted to work centres that voluntarily adopt a mechanism for putting into practice initiatives related to labour equality and non-discrimination.

In practice, in 2020, 57,826 women worked in the Mexican mining sector, which represents 15.5% of the workforce in the metallurgical and mining sector, with an annual growth rate between 5% and 7% (CAMIMEX, 2021). Moreover, in 2019, CAMIMEX signed a collaboration agreement with Women in Mining (WIM-Mexico) to "jointly execute projects related to gender equality to develop, promote and encourage women's participation in the mining sector and to foster equal opportunities" (CAMIMEX, 2021).

There are regulations related to health and safety at work for the mining sector, as well as for the monitoring of occupational health issues.

The Federal Labour Law establishes that employers are obliged to comply with "the regulation and the official Mexican laws on safety, health and environment at work" (Title Four, Subsection XVII).

In addition, Mexico has two laws on health and safety at work related to mining: the Law on Underground Coal Mines Safety and the Law on Underground and Opencast Mines. These rulings are specific to each type of mining and provide checklists for monitoring compliance.

Companies train their workers in safety, personal protection equipment, and safety procedures in accordance with these regulations.

Through the STPS, the Mexican Institute of Social Security, and the Federal Commission for Protection against Sanitary Risks, the government enforces the laws on labour health, safety, and general health, although they are not specific to mining (see Weaknesses).

Penalties are imposed for noncompliance with the regulations on health and safety in mining.

The Federal Labour Law contains a section specific to mine workers (Chapter XIII), which establishes that people directly in charge of the operations and supervising mining works shall be directly responsible if they do not comply with the implementation of safety

measures included in the regulations; it also imposes penalties when accidents are caused as a result of non-compliance (Section 343-E).

In addition, the Federal Regulation of Health and Safety at Work imposes penalties for not complying with health and safety regulations at work, and the price of such penalties varies depending on the section in breach (Title Nine).

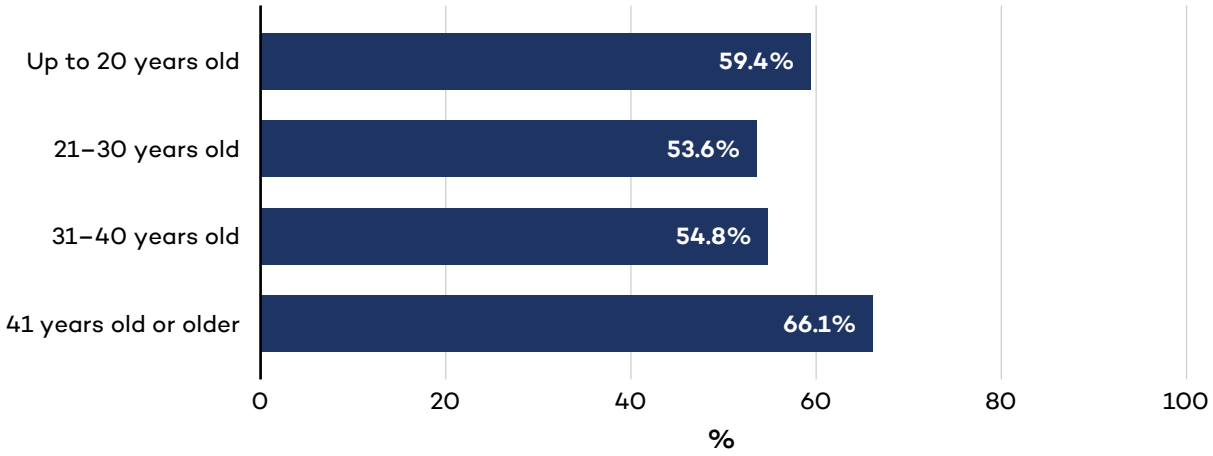
Concessionaires are obliged to train Mexican personnel in health and safety issues. More than half of the mining personnel are trained in health and safety issues.

According to mining health and safety regulations, mining companies are obliged to train and instruct workers to carry out their work in a safe manner (Subsection 5.5 of the NOM-032-STPS-2008 and Subsection 5.26 of the NOM-023-STPS-2012).

According to the 2019 economic census, more than 50% of the mining labour force is trained in different mining-related fields. When breaking down the trained labour force by age, 59.4% was 20 years old and younger, 53.6% was between 21 and 30 years old, 54.8% was between 31 and 40 years old, and 66.1% was 41 years old or older.

Regarding workers' levels of education, 38.1% of the qualified personnel had no education, 60% had received primary education, 60.4% had a high school education, and 55.8% had higher education.

FIGURE 12. Mining sector personnel qualification



Source: DataMéxico, 2021.

The law takes into consideration national employment issues.

Mexican legislation establishes that companies must hire at least a high percentage of Mexican professionals and workers. According to this legislation, 90% must be Mexican workers (Section 7 of the Federal Labour Law). Only Mexican professionals and technicians shall be hired unless there are no professionals or technicians in a specific field in the country. In that case, up to 10% of foreign workers may be temporarily hired.

This regulation is not applicable to directors, managers, and general managers. However, in practice, the upper echelons of mining companies are occupied by Mexican managers.

Weaknesses

Community engagement and consultation procedures are only carried out at the request of the interested party, and international standards are not observed.

In Mexico, community engagement and consultation procedures are not usually part of the permit process for mining projects. In accordance with the LGEEPA, after receiving the EIA, SEMARNAT must make the record publicly available for consultation at the SEMARNAT offices and must publish the list and the resolutions of the pending EIAs in Gaceta Ecológica. Any member of the affected community can request that SEMARNAT carry out a public consultation procedure. As a result, Mexican environmental legislation does not consider public consultation procedures as mandatory; they are only carried out at the request of the interested parties.

In accordance with Principle 10 of the Rio Declaration on Enironment and Development (2006), "States shall facilitate and encourage public awareness and participation by making information widely available." In Mexico, information related to an EIA is not widely accessible since it is only available at the SEMARNAT offices.

There is no legislation available to regulate Indigenous consultation.

Article 2 of the Constitution, added in a 2001 constitutional amendment, includes advances in Indigenous rights. Among other things, this amendment defined more thoroughly how Mexican Indigenous policy should be developed. However, prior consultation is not explicitly mentioned as part of governmental obligations.

Mexico adopted Convention No. 169 of the International Labour Organization (ILO). Ten years after Mexico's ratification of Convention No. 169, and mostly as a result of the constitutional amendment on human rights made in 2011, prior Indigenous consultation started to be considered in courts (as in the cases of the Yaqui [2013], Maya [2015], and the Zapoteca [2020] communities). Through court decisions, Mexican authorities have been forced to carry out Indigenous consultation procedures before issuing concession administrative acts. There have been cases in which the constitutionality of the Mining Law has been revised for not including Indigenous consultation procedures in its text.

Consultation procedures have been carried out that directly apply Convention No. 169, with protocols supporting each consultation, and also that apply the principles of the Escazú Agreement. However, in spite of the different attempts to pass an Indigenous consultation law, Mexico does not have one yet. Issues that need to be resolved include the procedure to be followed, which authorities should take part, and how to manage or verify compliance with the agreements reached. In addition, the mining authority currently grants exploration and exploitation concessions through the same administrative decision and does not carry out a prior consultation procedure before granting such concessions, alleging that such concessions do not have an impact in the field yet.

The government's omission in enacting a law to regulate prior consultation Leaves Indigenous Peoples' rights unprotected, and, by not complying with international commitments, any administrative decision may be void.

Safety issues are not in place during project approval processes and mine monitoring.

The DGM and the STPS do not review or assess mining projects for safety issues before construction begins. The STPS is in charge of monitoring all work centres, including the mining industry. Monitoring is limited because it is not specific to mining.

Monitoring safety issues in the mining industry is not just limited to compliance with general standards, such as the adequate use of personal protection equipment or safe inner structures. The stability of mine workings, tailings, and dumpsites, among others, should also be monitored. This type of monitoring requires mining experience, which, in general, the STPS lacks. PROFEPA is in charge of monitoring stability issues in mining works, but it does not have the power nor the resources to carry out independent inspections to confirm the results of the studies submitted by the mining company.

There is a lack of dialogue with NGOs.

Although the government has met with different NGOs to discuss, among other things, the mining industry and its relationship with communities, and although the EITI has provided a good communication exercise for stakeholders, there is not an appropriate dialogue or a permanent, ongoing, and open dialogue between the parties. In the past, SEMARNAT has invited NGOs to engage in dialogue, but NGOs did not attend. As a result, the government does not know civil society's concerns and demands related to mining. The NGOs are close to communities. As a result of this lack of collaboration, the government is missing the opportunity to prevent social conflicts.

There are no gender-sensitive programs, except in one state.

Although there is legislation regarding gender issues applicable to the mining industry, there are no federal government gender-based programs or policies developed for mining. There is only one gender-based program, developed by the Ministry of Economy of the State of Zacatecas, in which mining companies participate, among other economic activities, since it is a program intended for all local industries.

There is no integration of the mining sector into national/provincial/municipal development plans. Socio-economic planning is limited; social licence is not subjected to regular review.

The different development plans of the federation, the states, and the municipalities do not take into consideration the mining sector. In addition, there is no dialogue or coordination mechanism promoting joint work between governmental policies and the mining sector.

Health and education services provided by the companies and the government are not aligned or coordinated. Mining companies work voluntarily in this field, answering community demands without consulting public entities to coordinate their work. In addition, a mechanism to gradually delegate responsibilities to stakeholders other than mining holders is not considered; as a result, after mine closure, there is no physical and human infrastructure available to provide continuing education and health services.

The permit process does not require social issues to be identified and managed. Even though some social issues must be included in the EIS process (see Strengths), the law does not require proponents to identify socio-economic information for the mining project so that the authority has the power to assess such information.

The government does not demand that companies have socio-economic plans or that plans be regularly updated if there are changing conditions or new local, regional, or national goals. This limits the government's power to review permits that do not comply with national goals.

Regarding security issues, the Mexican government does not have an effective policy to protect human rights and the security of miners and communities.

The government does not adopt the necessary measures to protect human rights or to ensure the safety of miners, their families, and their communities.

In the past, the National Gendarmerie had a force dedicated to overseeing extractive activities, and a roundtable was organized between the National Gendarmerie of the Federal Police, the government, and mining companies to address safety issues. Today, the National Gendarmerie has been dissolved, and the initiatives of this roundtable, as well as the protection of mining activity, have been abandoned. Currently, the security of miners, their families, and their communities is in the hands of each mining company with no coordinated action with the government.

Education is not promoted as a national priority objective.

Although the LFD allocates a big portion of mining financial revenues to the Ministry of Education, in practice, this cannot be verified due to a lack of transparency. Infrastructure and human resource capacity are neither created nor improved to strengthen education services, and there is no governmental leadership to gradually assume larger responsibilities regarding education so that, after the mine closure, there is physical and human infrastructure available to provide education services.

The Mexican government does not require mining companies to maintain high standards or adhere to national or international regulations on human rights.

Human rights issues are not addressed in concession applications or during the monitoring of mining operations. The Mexican government does not require compliance with or respect for national or international legislation on human rights.

Theme IV: Environmental Management

The starting point of this MPF theme is the recognition that ecosystems are extremely important for any society looking for sustainable development.

This section will address the following issues:

- The adequate environmental management of surface and groundwater resources through appropriate regulations that allow the sustainable use of water.
- Environmental management to avoid or reduce potential adverse effects on biological biodiversity.
- Sustainable environmental management of mining waste requiring mining companies to design and build physically and chemically stable mining waste facilities during the operation and closure stages. The government must be in charge of monitoring compliance and can hire international experts to ensure that environmentally sound international best practices are followed.

- Emergency management. Emergency programs and plans shall be included in the EIA of mining projects, and for that, there should be straightforward regulations on this matter.

Key Laws and Policies

- General Law on Ecological Balance and Environmental Protection
- General Law of Sustainable Forestry Development
- General Law of Wildlife
- General Law for the Prevention and Integral Management of Waste
- National Waters Law
- General Law on Climate Change
- Federal Law on Environmental Liability
- Regulation of the General Law of Sustainable Forestry Development
- Regulation of the LGEEPA of Wildlife
- Regulation of the LGEEPA for the Prevention and Integral Management of Waste
- Regulation of the National Waters Law
- Regulation for the Determination and Payment of the Assurance Fee for Non-Expiring National Water Rights
- Regulations of the General Law on Ecological Balance and Environmental Protection regarding the Environmental Impact Assessment, Protected Natural Areas, Self-Regulation and Environmental Audits, Ecological Zoning (DOF 8-08- 2003), Prevention and Control of Pollution of the Atmosphere, and Pollutant Release and Transfer Register
- Regulation of the General Law on Climate Change on the National Registry of Emissions
- Regulation for the Protection of the Environment against Noise Pollution
- Law for Environmental Protection – Native species of Mexico forest flora and fauna – Categories of risk and specifications for their inclusion, exclusion, or change – List of species at risk
- Law establishing the specifications, identification procedure, classification, and list of hazardous waste
- Law establishing the specifications of environmental protection for direct mining exploration activities in agricultural, stockbreeding, or wasteland areas and in areas with dry and temperate climates where the vegetation of xerophile shrublands, tropical deciduous forest, coniferous forest, or holm oak develop
- Law establishing the elements and procedures to implement the management plans for mining waste
- Law establishing the environmental protection requirements for leaching systems of gold and silver ores
- Law establishing the requirements for environmental protection for copper leaching systems

- Law establishing the criteria for determining concentrations for remediation of soil contaminated with arsenic, barium, beryllium, cadmium, hexavalent chromium, mercury, nickel, silver, lead, selenium, thallium, and/or vanadium
- Law establishing the procedure to characterize tailings, as well as the specifications and criteria for the characterization and preparation of the site, project, construction, operation, and post-operation of tailings dams
- Law establishing the maximum permissible limits of contaminants in wastewater discharges into national waters and property
- Law establishing a list of substances that must be reported before the Pollutant Release and Transfer Register

Water Management

CONAGUA presented the 2020-2024 National Water Program, a special program derived from the 2019–2024 Mexican National Development Plan. A consultation procedure was carried out to develop this program, which aimed to identify public issues and main goals.

In Mexico, there are official and technical standards on the quality of water discharged into water bodies and natural watercourses. The main ruling applicable to wastewater discharges is the NOM-001-SEMARNAT-1996, which establishes maximum limits allowed for different uses and in different discharge-receiving environments (rivers, dams, coastal waters, and soil). There is currently an ongoing project to update this standard approved in 1996 (PROY-NOM-001-SEMARNAT-2017).

Water quality monitoring is part of the environmental surveillance program, according to which each mining operation must monitor its own environmental performance and compliance. Water monitoring programs tend to focus mainly on the operational stage, and there are no water management strategies for water catchment areas and the potential regional influence.

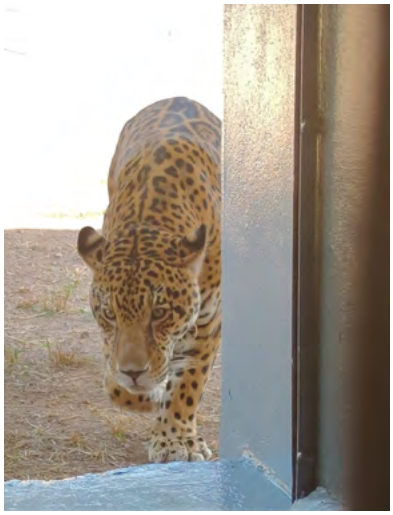
In Mexico, CONAGUA coordinates the National Water Information System, which collects and publishes geographical and statistical data from the water sector based on information derived from the different areas of CONAGUA and other institutions. The National Water Information System has 5,034 (surface, underground, and coastal) monitoring sites throughout the country.

Biodiversity

The National Commission for the Knowledge and Use of Biodiversity (CONABIO) has coordinated a process for drafting the Mexican National Biodiversity Strategy (ENBioMex) and the 2016–2030 Action Plan, which is a guiding document that includes the main aspects needed to sustainably conserve, restore, and manage biodiversity and the services provided in the short, medium, and long terms.

In accordance with the LGEEPA, SEMARNAT must issue regulations to prevent and control the effects of exploration and exploitation on non-renewable resources; to protect aquifers, soils, and wildlife; and to establish the adequate location and structure of waste rock, tailings, and mine slag storage facilities (Section 108).






In 2020, NOM-120-SEMARNAT-2020 was revised and amended to establish the specifications for environmental protection from direct mining exploration activities in agricultural, stockbreeding, or wasteland areas and in areas with dry and temperate climates where the vegetation of xerophile shrublands, tropical deciduous forest, coniferous forest, or holm oak develops. In accordance with this standard, if flora and fauna species are found, they shall be protected through conservation and restoration projects or by implementing special management and conservation measures. The degree of maximum damage per hectare cannot be higher than 25% (Subsection 4.3).

Protected Natural Areas (PNAs)

PNAs are areas of the national territory in which original environments, or their ecosystems, have not been significantly affected by human activities, and must be preserved and restored (Section 44 of the LGEEPA).

Through CONANP, SEMARNAT creates the PNAs. The resolutions that create the PNAs are issued over agricultural property, private property, and state property without affecting possession or ownership (Article 27, para. 3 of the Constitution). The ownership of the lands affected by these resolutions will remain as they are. However, there will be restrictions regarding the use and utilization of their natural elements subject to appropriation for social benefits.



The PNA categories established by federal, state, and municipal jurisdictions are the following (Section 46):

PNA categories established by federal jurisdictions:

- Biosphere reserves
- National parks
- Natural monuments
- Areas for the protection of natural resources
- Areas for the protection of flora and fauna species
- Sanctuaries

PNA categories established by state jurisdictions:

- Parks
- State reserves
- Categories established by local legislation

PNA categories established by municipal jurisdictions:

- Ecological conservation areas
- Categories established by local legislation

Finally, there are areas voluntarily devoted to conservation.

PNAs include core zones and buffer zones. Natural resources shall only be exploited in particular buffer zones, called “special use zones,” provided that such activities render public benefits, do not disturb the landscape, do not produce a serious ecological imbalance, and are subject to strict regulations for the sustainable use of natural resources, fully compliant with the management programs established by SEMARNAT. According to this ruling, exploration and exploitation works and activities of mineral resources within the PNAs shall be carried out in compliance with Section 20, para. 2 of the Mining Law, which states that such works and activities shall be carried out with the authorization of CONANP. CONANP verifies that mining activities are compatible with the PNA resolution and management program.

Waste Management

The General Law for the Prevention and Integral Management of Waste (Ley General de Prevención y Gestión Integral de Residuos [LGPGIR]) states that waste from the mineral-metallurgical industry produced from mining and treatment of minerals such as tailings and waste from abandoned leaching piles, as well as metallurgical waste from metal smelting, refining, and transformation processes, are regulated under federal jurisdiction (Section 17 of the LGPGIR).

The degree of hazard of this wase and its integral management will be determined in accordance with the Federal Mexican Standards (NOMs) and will follow management programs as set forth in the LGPGIR.

The Regulation of the LGPGIR establishes the list of waste derived from the mining and metallurgical industry (Section 32 of the Regulation). Final disposal of waste derived from the metallurgical industry shall abide by the provisions of NOM-157-SEMARNAT-2009. This standard establishes adequate test methods to determine if mining waste is hazardous or not, and the management of such waste will depend on its degree of hazardousness. Even when this waste is considered non-hazardous, if derived from metallurgical processes, will be under federal jurisdiction and under the regulations of SEMARNAT.

Depending on the specific process, authorization from the SEMARNAT is necessary in cases where hazardous wastes are used in productive processes, incinerated, or transported, if containment structures are required in hazardous waste management facilities or if such waste is imported or exported.

Emergency Management

Each mine site must have an emergency response plan (Subsection 13 of the Standard on Underground and Opencast Mines), which must also be available to workers in the site offices.

This emergency response plan must include incorporating one or more squads or crews to respond during fire, flood, or collapse emergencies, to rescue or salvage individuals, and to evacuate and provide first aid, as well as alert, alarm, and care emergency procedures.

Regarding environmental matters, a high-risk metallurgical operation must submit an accident prevention program before the SEMARNAT. In addition, such an operation must have environmental liability insurance.

Strengths

An environmental impact authorization is required, including a thorough environmental monitoring program and financial assurance.

Environmental impact authorizations, based on the EISs submitted by the proponent, are the official starting point of environmental monitoring and compliance. This process requires an environmental surveillance program to monitor and verify compliance with the implementation of prevention, control, and compensation measures for environmental impacts.

Other required authorizations and studies include the following:

- Authorization for the change of land use in forest lands, which is only exceptionally granted and which results in a payment to the Mexican Forest Fund as environmental compensation.
- An environmental risk study in cases where hazardous substances are stored and used.
- An environmental description of the ecosystem in which a mining project is intended to be developed, including an inventory of flora and fauna. If protected species that could be affected are identified, specific protection and monitoring programs must be developed and regular reports submitted.

The SEMARNAT may require insurance or financial assurances to ensure compliance with the terms and conditions established in the authorization whenever serious damage to the ecosystems could occur during the works (Section 35). The regulation defines the cases in which serious damage to the ecosystem may occur—for example, when high-risk activities are performed or when activities are carried out in PNAs (Section 51 of the Regulation).

The Mexican government encourages companies to conduct voluntary third-party audits.

Mexico has a National Program of Environmental Audits. Environmental audits are voluntary processes that mining companies undergo to improve their environmental performance, committing themselves to exceed the requirements established by regulations on environmental protection. The auditing process is carried out before PROFEPA.

Once companies undergo these auditing processes, a certificate is issued, and companies can publish it to speed up government inspections. If companies comply with the action plan and the requirements to obtain a Clean Industry Certificate—which recognizes the companies' good practices—the certificate can be published, and government inspections are faster. About 40 mining companies have valid Clean Industry Certificates.

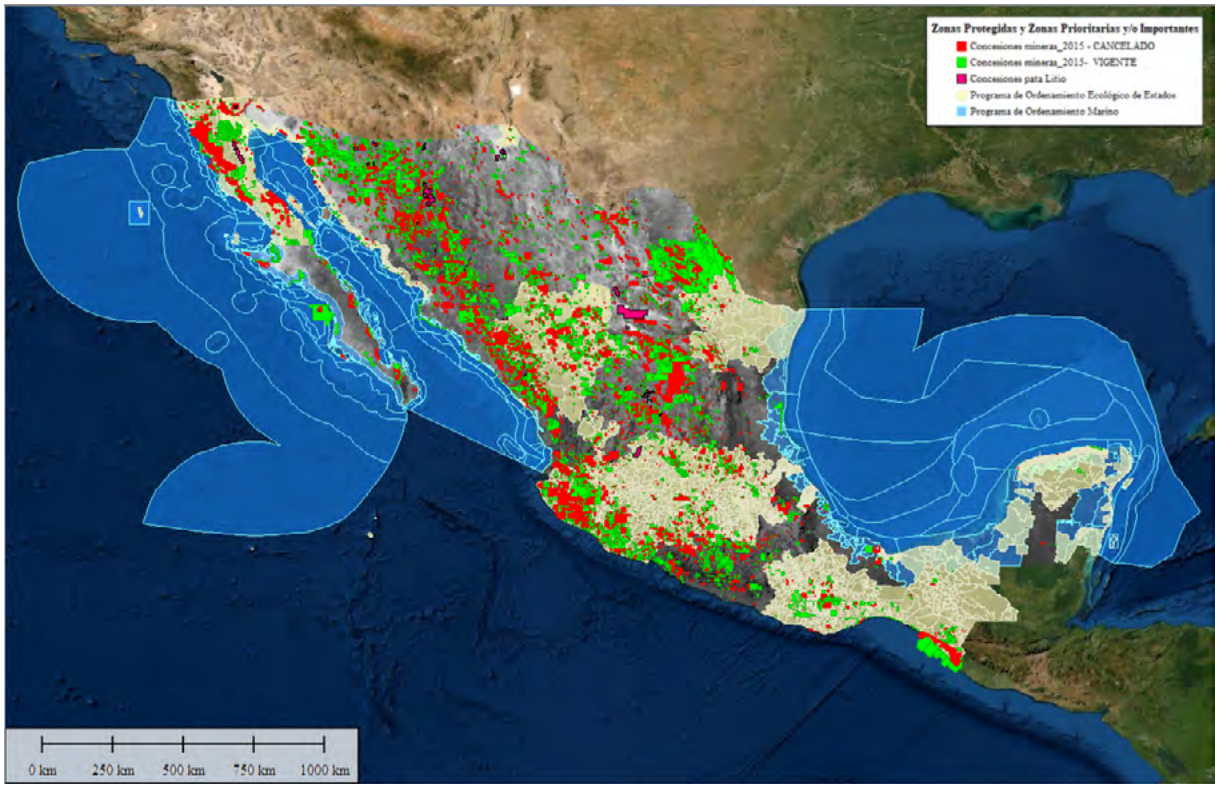
Mexico has advanced land-use planning practices.

Mexico has made progress in environmental planning for the country, as shown in the Ecological Zoning Regulation. This zoning plan (compatible or non-compatible activities of environmental management units) is applied to its full extent in 16 states and partially applied in nine states; seven states are still not covered in the zoning plan. The zoning plan also covers the maritime territory and the national waters of the Atlantic and North Pacific oceans.

The ecological zoning plan establishes the areas in which mining activities can be carried out. SEMARNAT reviews the general ecological zoning plan so that its resolutions follow the guidelines of the zoning program according to land aptitude, trends in natural resource degradation, environmental services, natural risks, and the conservation of natural heritage.

In 2012, the General Ecological Land-Use Zoning Program was published. The program's Strategy 15 requires the sustainable use of non-renewable natural resources, inclusive community engagement in local regional zoning plans, and coaching medium- and small-scale miners to improve environmental compliance. This program established ecological regions throughout the country, identifying mining as one of its various goals.

FIGURE 13. Land-use zoning and mining concessions (state, regional, and maritime)



Source: Map drawn by the authors based on CartoMinMex – Information System for the Mexican Ecological Zoning Plan (2021).

Biodiversity plans and reports are required, and there are specific programs for biodiversity management in certain areas.

The EIS requires the identification and description of protected or endangered species as well as measures to mitigate identified impacts. In accordance with the lists established in the NOM-059-SEMARNAT-2010 standard, if flora and fauna species are identified, they shall be protected through conservation and restoration projects or by implementing special management and conservation measures. The degree of maximum damage per hectare cannot be higher than 25% (Subsection 4.3).

In addition, a mechanism called the Environmental Management Unit allows mining companies to carry out projects for the conservation, protection, and reproduction of wildlife. The Environmental Management Unit requires investments and the existence of a program and a technical manager. Implementing a project under this mechanism implies a positive outcome for species within its scope.

FIGURE 14. Examples of Environmental Management Unit (UMA) projects

Source: Photos by Epitacio Robledo

There is a process to coordinate the existence of natural areas with the mining industry.

Exploration and exploitation work and activities within the PNAs shall only be carried out with the authorization of CONANP (Section 20 of the Mining Law and Section 94 of the Regulation).

CONANP verifies that mining activities are compatible with the PNA resolution and the management program for the PNA authorization.

There are standards on the quality of water discharged into natural watercourses.

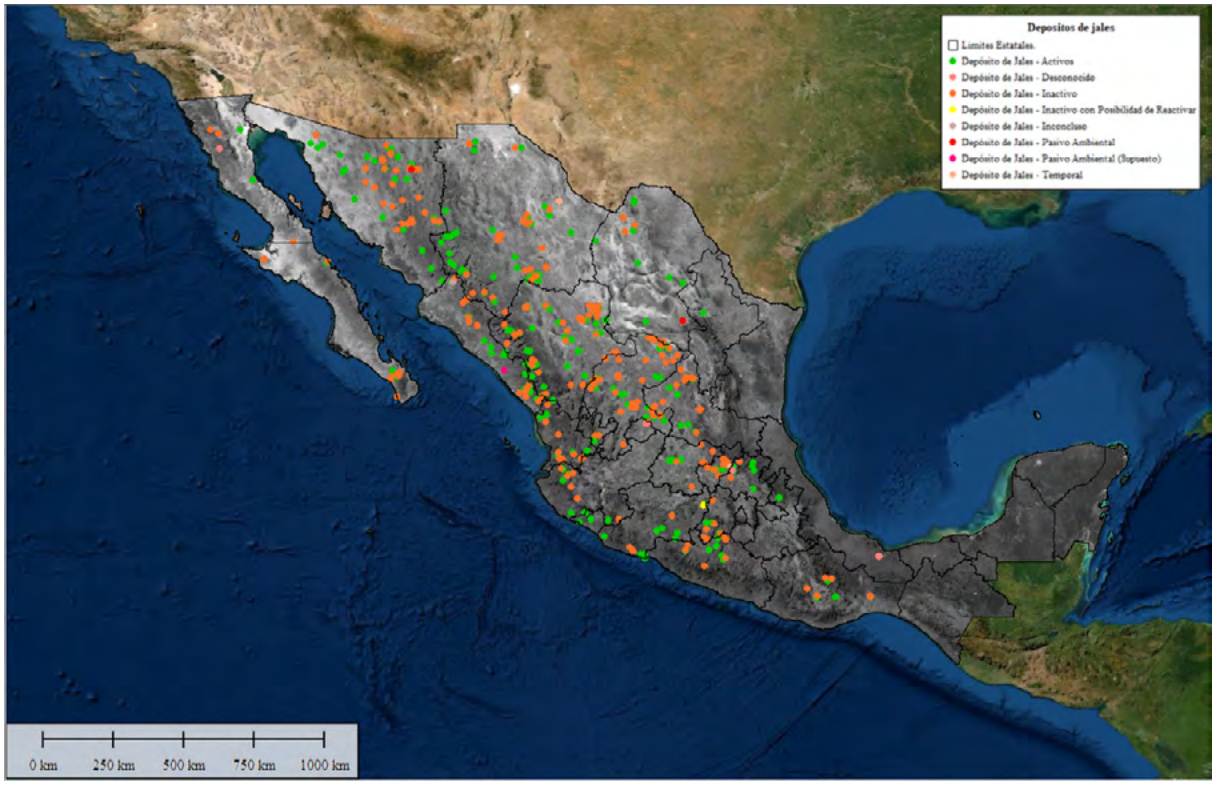
In Mexico, there are official standards and technical standards related to the quality of waters discharged into water bodies and natural watercourses. The main ruling applicable to wastewater discharges is NOM-001-SEMARNAT-1996 establishing maximum limits allowed for different uses and in different discharge-receiving bodies (rivers, dams, coastal waters, and soil). At present, this standard is being updated (PROY-NOM-001-SEMARNAT-2017).

SEMARNAT is compiling an inventory of tailings storage facilities.

In 2021, SEMARNAT published the first authorized inventory identifying and locating tailings storage facilities throughout the country to lay the foundations for designing public policies for mining waste management.

The database, shown in Figure 15, includes 585 tailings storage facilities, 296 of which were classified as active, four as environmental liabilities, 282 as inactive, one as incomplete, and two as temporary.

FIGURE 15. Map of tailings storage facilities



Source: Map drawn by the authors based on CartoMinMex – Information System for the Mexican Ecological Zoning Plan (2021).

Weaknesses

Environmental regulation is good, but environmental monitoring is inadequate.

In general, environmental legislation and regulations are good and thorough. However, some companies in Mexico voluntarily apply higher international standards and/or better practices.

PROFEPA is in charge of environmental monitoring, inspection, and verification, but it does not have enough financial resources, equipment, personnel, or specific training on mining issues to carry out adequate environmental monitoring of the operations.

PROFEPA is not trained to perform studies or to verify the safety conditions of mining sites (tailings storage facilities, waste rock dumpsites, and leaching piles). This verification is carried out through reports, documents, and studies provided by mining operations (prepared by internal personnel and/or third parties) and cannot be adequately monitored.

In addition, from 2018 to 2021, budget cuts on environmental authorities led to a lack of personnel and equipment necessary for monitoring.

Environmental regulations are inconsistent.

There are specific NOMs for the mining sector that contradict one another on the limits of pH values. For example, the standard on tailings storage facilities and the standard on mining waste establish different hazardousness criteria, one being more lenient than the other.

Environmental compensation funds are not assigned to the corresponding region.

Regarding the authorization for a change in land use, the funds resulting from the environmental compensation must be assigned to the region (Section 98 of the General Law of Sustainable Forestry Development); however, CONAFOR does not assign them to the corresponding forest-hydrological basins, as provided by law.

Risk studies for EISs are not adapted for mining operations.

Risk studies for mining projects required by law to be included in the EISs are based on outdated concepts for industrial plants and on lists of hazardous substances. For example, tailings storage facilities are not included, and, as a result, risk studies are not comprehensive enough for mining operations.

There is no requirement to update information on tailings storage facilities, and there is a lack of adequate monitoring.

Although there are specific standards for the construction and description of tailings and other mining waste storage facilities (NOM-141-SEMARNAT-2003 and NOM-157-SEMARNAT-2009), once these facilities are built, they are no longer duly updated or monitored during the life of the mine. As a result, the government cannot ensure that these structures can adequately manage geotechnical risks or environmental impacts. Regulations do not require companies to design, manage, or maintain these structures in accordance with internationally recognized standards.

The possibility of tailings dam failures is not always considered in financial assurances.

SEMARNAT may require insurance or financial assurances to ensure compliance with the terms and conditions established in the authorization when, according to the cases established by law, the operations could cause serious damage to ecosystems (Section 35 of the LGEEPA). The economic-technical studies used to determine financial assurance do not consider the possibility of tailings dam failures.

The inventory of tailings storage facilities is not properly done.

Although SEMARNAT published the first authorized inventory identifying and locating tailings storage facilities throughout the country, the database is incomplete and does not adequately identify the status of storage facilities, especially those that are inactive (282 were identified) and those that represent environmental liabilities (four were identified).

There are deficiencies in considering the mining sector in environmental regulations.

The General Ecological Land-Use Zoning Program implies an important step forward and a long-term vision (see Strengths). However, resources, personnel, and budget are too limited to develop adequate regional, local, and maritime zoning plans.

In addition, SEMARNAT should work jointly with federal and local mining companies and authorities when developing a new zoning plan to assess the suitability of the lands for the mining sector, as well as other economic sectors that coexist in the same place.

Mining project approvals are hindered by a lack of management plans for PNAs.

Although there is a procedure to carry out mining works and activities within certain PNAs, CONANP delays the development of PNA management plans. Of the 187 PNAs, 35% do not have a management plan. As a result, mining activities are not approved in special use zones, where the law allows such activities. Approval processes for all types of activities are generally blocked when there is no PNA management plan.

There is currently poor water management and weak monitoring.

Water management is also subject to the lack of personnel necessary to address water concession applications and other permits, as well as to carry out audits to verify compliance with the authorizations granted in accordance with the National Water Law. This affects the monitoring process by authorities on the maximum permissible levels of contaminants in wastewater discharges.

There are concerns from civil society about water consumption concessions.

Water consumption concessions granted to mining companies, as well as to other industries, have raised concerns in civil society since concessions for exploitation activities have been granted, despite the fact that water is considered a scarce resource and without verifying the amounts of water actually extracted. The major concern is related to the fact that a larger amount of water is assigned to economic activities rather than to the surrounding communities, which, in many cases, do not have the necessary infrastructure to ensure water access. The Mexican government is also accused of not cancelling concessions after environmental disasters had an impact on the communities.

The Clean Industry Certificate does not cover the whole operation, only the facilities voluntarily included.

Although the environmental audit constitutes a solid environmental policy instrument, its voluntary nature may imply that companies choose not to audit facilities requiring close monitoring. This is the case, for example, of areas degraded by previous operators, environmental liabilities, or areas that are not authorized to operate. The Clean Industry Certificate seems to certify the whole mining operation or company, but in reality, it only covers certain facilities.

There is no requirement for full contingency plans.

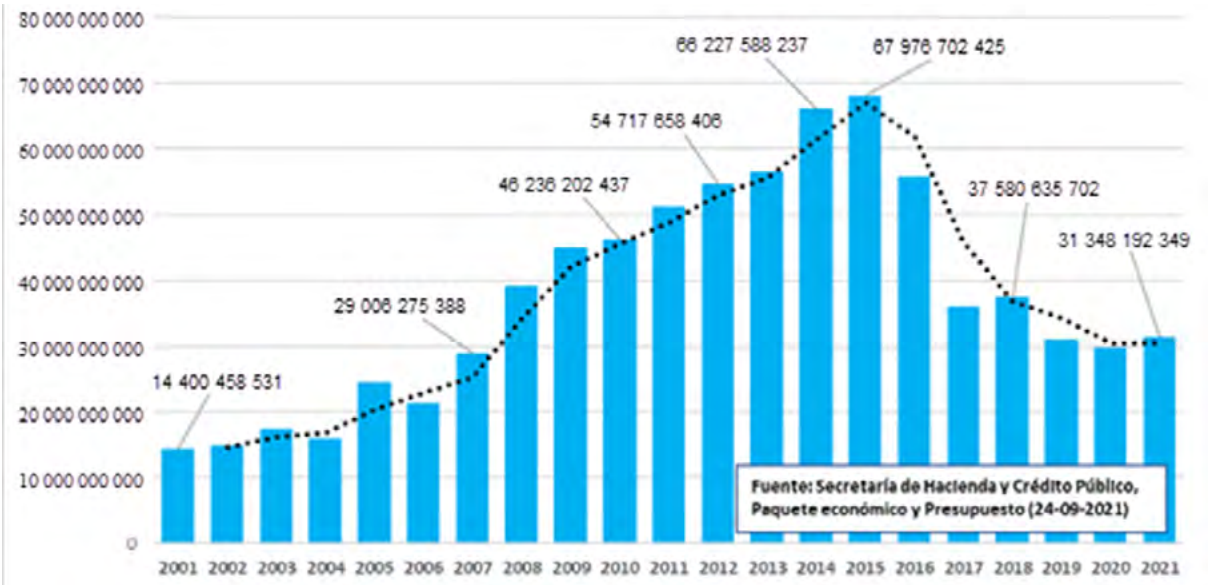
Different types of plans are required, including an accident prevention program for metallurgical activities and a waste management prevention program, but they are not specific to the mining industry. As a result, they do not cover all the contingencies that may occur in this industry.

These plans are not required to be updated or reviewed, nor is continuous cooperation with local parties or governments. As a consequence, the government cannot ensure that the effectiveness of the emergency plan and the energy response are performed in cooperation with communities and all levels of government. In addition, the government cannot ensure that emergency plans are comprehensive or that they comply with current best practice standards, such as the Awareness and Preparedness for Emergencies at Local Level process of the UN Environment Programme.

There has been a reduction in personnel and the budget for environmental management.

Starting in 2015, SEMARNAT's budget has gotten smaller. From 2018 to 2021, SEMARNAT's budget (mainly the Undersecretariat of Management for Environmental Protection) was reduced by 28%, the budget of the National Institute of Ecology and Climate Change was reduced by 31%, and the budget of the National Forestry Commission was reduced by 38%.

FIGURE 16. SEMARNAT budgetary trends



Source: Ministry of Finance and Public Credit Economic Program and Budget.

Due to a lack of funds, the government has adopted other ways to collect environmental taxes—such as quarries, water discharges, and pollution, among others—which increase the revenues to SEMARNAT.

In the last few years, SEMARNAT state delegates have been laid off, and personnel from state delegations have been reduced by 30%, which makes it difficult to process the more than 150 types of procedures related to environmental management (including EIAs, forest

management programs, and the authorizations for land-use change, among others), which amount to 130,000 procedures a year.

Theme V: Mine Closure

For mining sector management to be compatible with sustainable development, every mining project should have closure plans in place from the very beginning of the mine life. To this end, the recommendations included in this theme focus on the following topics:

- Ensuring that closure plans prepared by mining companies are of a high standard and updated regularly.
- Developing financial assurance mechanisms for mine closure.
- Taking a leading role in exploring options for orphaned and abandoned mines within the state jurisdiction.

Key Laws and Policies

- LGEEPA
- Regulation of the LGEEPA
- General Law for the Prevention and Integral Management of Waste
- Standard setting forth environmental protection specifications for mining exploration activities
- Standard setting forth the elements and procedures for implementing mining waste management plans
- Standard setting forth environmental requirements for gold and silver leaching systems
- Standard characterizing the hazardousness of waste
- Standard characterizing tailings
- Guide to Submitting the Mining Environmental Impact Statement: Specific Area

Mine Closure Regulation

In Mexico, mine closure regulation is covered in different legal provisions according to the phase of the mining operation.

TABLE 10. Regulations applicable to mine closure

Regulation	Content
Phase: Exploration	
NOM-120-SEMARNAT-2020	When exploration is completed and the project is abandoned, the responsible party for the project shall conduct the remediation program, which shall include slope stabilization, backfilling of exploration holes and trenches, soil scarification, disabling and closure of new roads, sealing of blast holes, and revegetation and forest restoration. The closure program shall contain the schedule of activities, including those related to maintenance. (Section 4.1.18).
Phase: Exploitation	
NOM-157-SEMARNAT-2009	DDuring the design, construction, operation, and closure of waste storage facilities and waste disposal facilities, the following engineering and maintenance specifications for maintaining physical stability shall be met. (Section 5.6.2) In the case of waste dumpsites, heaps and other tailings storage facilities not subjected to a specific NOM, control measures shall be put in place to (Section 5.6.2.1): a) Avoid wind and water erosion processes, as well as mechanical drags. b) Prevent the environmental dispersion of acid drainage, leaching, and runoff, when applicable.
Phase: Beneficiation	
NOM-157-SEMARNAT-2009	Dumps of waste from pyrometallurgical and hydrometallurgical processes should comply with specific regulations. Vulnerable water bodies shall be monitored during the operation and post-operation stages in all dumpsites (Section 5.6.3.); trees should be restored in areas where waste dumpsites are no longer operative.
NOM-155-SEMARNAT-2007	Once ore recovery is completed, the leaching pad shall be washed and treated before becoming leached or spent ore dumpsites. The leached ore dumps shall be considered stable when the pad-washing solution meets the values determined in this regulation (Section 5.8.1.). This regulation sets criteria for the closure of leaching pads (Section 5.9). There should be a monitoring program to evaluate the effectiveness of the protective actions taken. Aquifers must be sampled annually for 20 years as of the date of the leaching pad closure when, in the tests performed, leached or spent ore has been found to be hazardous (section 5.7.14.). Surface water monitoring should be conducted.

Regulation	Content
NOM-159-SEMARNAT-2011	For closure criteria (Section 5.8), chemical stability should be checked. Once copper recovery has been completed, results of the leachate acid generation potential assessment and climate information should be considered to define the environmental protection measures to be taken for the closure of the leaching pad. Once the leach pile washing process has been completed, prevention and control measures must be implemented to ensure the long-term physical stability of the leach pile (Section 5.8.3.2). Post-closure monitoring should be conducted in water bodies. This regulation defines closure as the activities of washing, final physical and chemical stabilization, and rehabilitation, beginning once the leaching system ceases operation.
NOM-141-SEMARNAT-2003	Once the tailings storage facilities reach the end of their life, measures should be taken to ensure that the closed facilities are not releasing particulate matter into the atmosphere and that discharges are impacting neither surface water nor groundwater (Section 5.7.1). When the tailings are potentially acid generating, the tailings should be covered with a mineral material or submerged in water to prevent acid drainage formation; plant species that promote substrate acidification should not be used (Section 5.7.2). A groundwater and surface water monitoring program should be implemented (numeral 5.8.1). Sampling must be performed semi-annually during the construction and operation of the tailings storage facility and annually for a period to be determined according to the monitoring results obtained as of the date of closure.

Note: The Guide to Submitting the Mining Environmental Impact Statement: Specific Area *also provides guidance for the abandonment of mine sites (post mining), regardless of if it is in the exploration, exploitation, or beneficiation stage (Section I.2.6). The guide suggests describing the proposed mine abandonment program, with emphasis on rehabilitation, compensation, and restitution measures.*

Strengths

There is a regulation on closure applicable to mining.

In Mexico, the significance of the potential long-term impact of mining is clearly recognized. The closure stage of a mining project is included in the EIA. The EIA process for mining projects requires the preparation of a closure plan for site restoration at the end of the operation. Mexico has the basic legal instruments covering mine closures and environmental restoration, such as the LGEEPA, the General Law for the Prevention and Integral Management of Waste, and regulations or provisions designed for or covering the preservation or restoration of the ecological balance and the protection of the environment or its elements.

There are specific regulations for mine closure at different mining stages.

In the mining sector specifically, there are also certain regulations regarding mine closure, such as NOM-120-SEMARNAT-2020. This regulation establishes that when the exploration

project is completed and abandonment is decided, the responsible party for the project shall conduct the remediation program. The closure program shall contain a schedule of activities, including maintenance activities (Section 4.1.18).

There is a reference to mine closure plans in the EIS (Guide to Submitting the Mining Environmental Impact Statement: Specific Area) that provides guidelines for submitting a closure plan for a mining project and is a requirement for an environmental impact resolution authorizing the closure.

There is financial assurance for projects that could potentially cause environmental damage, which sets an example for a future mine closure assurance regulation.

Although there is no specific guarantee for the execution of the closure plan, the environmental law provides financial assurance for the potential generation of environmental damages (Section 35 of the LGEEPA). SEMARNAT must set the amount of the insurance and financial assurances according to the costs of restoration of the damage that could be caused by a breach of the terms and conditions established in the authorizations. Insurance or financial assurances may be established for every stage of the project being executed, and amounts should be updated every year. However, financial assurance for closure is not intended to repair damages, it is more substantial and preventive.

There is an inventory of potentially contaminated sites.

Since 2003, there have been some approaches to identifying contaminated sites in the country, such as the National Inventory of Potentially Contaminated Sites. This is not specific to mining, although mine sites are included. According to the inventory guidelines, contaminated sites known to public agencies, social organizations, academic institutions, and international organizations shall be identified (SEMARNAT, 2018). Thirteen cases have been reported in the mining sector, and four of them have a remediation program in place. There are some issues, such as a lack of characterization tests to determine if the sites are contaminated and a lack of resources for onsite visits. At present, there are more than 600 sites identified, and the government is starting to verify their contamination status. Public tenders for sampling are being requested.

Both initiatives are major steps toward identifying and remediating abandoned mines.

Weaknesses

There is no specific regulatory framework, and the quality of closure plans required is inadequate.

Although the SEMARNAT requires the submission of a mine closure plan (a condition for authorization), there is no specific legal or regulatory framework to require mining projects to address closure and post-closure of mining operations and to submit their plans at the start before construction approval is granted. The government does not have a robust legal and regulatory framework for the effective management of mines throughout their life cycle, including the post-mining transition. As a consequence, mining companies do not submit detailed closure plans with detailed engineering for the execution of the closure.

In compliance with the General Law on Waste, companies do perform a characterization of the waste and of the site and must propose a remediation plan in case of contamination. But this is not a mine closure plan.

Several closures that have been poorly executed and poorly overseen by the government are controversial and publicly known. There are no specific instructions for the submission of mine closure plans describing the technical and economic specifications for submitting closure plans for evaluation and approval by the authority.

There is no institutional capacity to monitor plans for closure and the post-mining transition.

As there is no mine closure regulation, and the capacities to monitor mine closure and post-mining plans have not been developed. Additionally, there is a lack of financial and human resources for the authorities in charge. There is also a lack of governmental support for the closures of those mines that want to comply with international standards. This creates a danger of sites not being properly closed, resulting in more abandoned mines and environmental liabilities.

There is no requirement to publish the closure plan or to consult with the communities.

There is no framework specifically requiring publication or public disclosure or the engagement of the community in the development of closure plans and goals. Effective planning for the post-mining transition should engage communities in planning and implementation. Broad-

based participation aligned with local and national development plans helps to ensure that decisions related to post-mining activities are supported by stakeholders and are easier to implement and manage.

Public engagement in Mexico is required as part of the preparation of the EIA; however, the EIA does not include mining closure.

There is no financial assurance for mine closure.

Closure plans must contain adequate financial guarantees for closure and post-closure expenses. The government should enact legislation, regulations, and guidelines on this subject.

In Mexico, SEMARNAT requires insurance or financial assurances to ensure compliance with the terms and conditions established in the concession authorization whenever severe damage to the ecosystems could occur during operations (Section 35, LGEEPA). The Regulation of the LGEEPA regarding environmental impact assessment defines the cases that can cause severe damage to ecosystems—for example, when high-risk activities are performed or when activities are carried out in PNAs (Section 51 of the Regulation). Insurance or financial assurances may be established for every stage of the project in progress, and amounts should be updated annually (Sections 52 and 53 of the Regulation).

However, the Mexican legislation does not address the obligation to provide financial assurances for mine closure before the start of the project so that if the company does not execute the closure plan, the government has the resources necessary to carry out the closure.

There are no significant guidelines or regulations on the following: (i) how to make realistic estimates to cover the cost of closure plans for outstanding work, including sudden closure cases and situations whereby independent contractors have to be commissioned for closure plans because the mine operator cannot or is not available to complete the work; (ii) liabilities, insurance, etc., with their corresponding details and conditions; (iii) qualified and approved financial institutions with an obligation to keep the assurance in good standing; (iv) whether the government has the right to obtain immediate and unrestricted access to the total amount of financial assurance; or (v) the mechanism for authorizing the use or release of financial assurance instruments as different work schedules or other requirements are completed or performed.

There is no requirement to use external experts.

The government does not have the internal capacity to validate risk assessments associated with closures, studies, or high-risk activities related to closure implementation, such as the management of acid mine drainage, hazardous waste disposal, etc. In addition, mining companies are not required to use external experts familiar with international standards and practices for the development of closure plans or for validating closure risk assessments.

The Mexican government provides no proper leadership on abandoned mines or preparedness for sudden closures.

The government does not offer consistent and adequate leadership in resolving the issue of abandoned mines and environmental liabilities from mining. Mine closure and restoration, due to centuries of mining history in Mexico, are closely related to environmental liabilities; there is no clear definition of responsibilities (work, land, and impacted regions) that could even lead to changes in land use and the economic impacts on affected third parties.

SEMARNAT is responsible for abandoned mines when there is no longer a party responsible for the site, but due to a lack of resources and regulations, SEMARNAT does not take the necessary leadership role.

Mexico has no regulations or plans to develop technological solutions (such as reprocessing mining waste) for abandoned mines and environmental liabilities. Actively addressing environmental liabilities would send a positive signal about Mexico's commitment to sustainable mining, especially to the public.

Theme VI: Artisanal and Small-Scale Mining

Regarding artisanal and small-scale mining (ASM), the MPF aims to improve the conditions for miners working outside the legal framework and to improve the contribution of the ASM to sustainable development. Policy recommendations on this theme are grouped as follows:

- Legal formalization of ASM through appropriate legal frameworks, technical support, and formalization strategies.
- The integration of the ASM into the formal economic system through the promotion of savings and investment, appropriate and transparent income policies, certification programs, and collaboration with larger mines.
- The reduction of social and environmental impacts through the provision of technical training, minimum health and safety standards, and anti-child labour programs; promotion of the role and safety of women in ASM; and rural-development and job-creation policies to promote alternative livelihoods.

Key Laws and Policies

- Mining Law
- Regulation of the Mining Law
- Minamata Convention

The ASM in the Mexican Law

The Regulation of the Mining Law has a chapter entitled "Promotion of the Small- and Medium-Scale Mining Sector and of the Social Sector," where a small-scale miner is defined as one whose:

- Gross income from annual sales of minerals or substances is less than 5,000 times the daily minimum wage in force in the Federal District, or
- Monthly extraction of ore is up to 15,000 tonnes of ore before the beneficiation process (Section 9).

The SGM must provide the small-scale mining sector with, among others, technical assistance on the evaluation of mineral deposits, metallurgical processes, and physical-chemical analysis of ore samples for its beneficiation (Section 9, Paragraph VII, Mining Law). On the other hand, the Ministry of Economy should develop programs to promote small-scale mining, specifying the requirements for obtaining loans (Section 8, Regulation of the Mining Law).

The ASM in Mexico

The ASM in Mexico is highly varied due to the amount of minerals extracted and their geographical distribution. Mexico's ASM sector is made up of an estimated 56,000 miners (ArtisanalMining.org, 2021), but the numbers are not up to date. The SGM states that in Mexico, small-scale mining is important in the extraction of minerals such as kaolin, celestite, quartz, diatomite, dolomite, feldspar, fluorite, phosphorite, graphite, coal, micas, olivine, silica, talc, gypsum, zeolites, and opal.

Small-scale mining operations vary in size. Given the criteria of the law, at least in part, small-scale mining in Mexico can be considered medium scale compared to other countries in the region.

Artisanal mining is the modus vivendi of many people, from the miners (gambusinos) and their families, who are at the base of this stratum, to the buyers of their amalgamated products, and even to small and medium-sized companies that buy minerals from these artisanal miners, adding these minerals to their formal production.

The common factor presented by the artisanal miners is a lack of legal operations under mining regulations and the lack of a concession title. There are many miners who produce extremely low volumes. Their monetary compensation, in many cases, barely allows them to support a family. Likewise, their production is unnoticed because the transaction is conducted directly and informally between the producer and the buyer.

There are at least nine zones with known artisanal mining of gold and silver: 1. Sonora; 2. Chihuahua; 3. Durango; 4. Sinaloa; 5. Nayarit; 6. Zacatecas; 7. Warrior; 8. Coahuila, and 9. Oaxaca. On average, an estimated 20,000 people work in artisanal gold mining (INECC, 2019).

In Sonora, where there is turquoise ASM, 1 kg of turquoise sells for MXN 1,200. Miners can extract 20 kg a day, and buyers sell it mostly as run-of-mine minerals to Arizona and Japan.

In Sierra Gorda of Querétaro, an estimated 700 to 1,000 miners extract mercury, and in 2016, production reached 804 tonnes of mercury just from the districts of Pinal de Amoles, Peñamiller, San Joaquín, and Cadereyta de Montes. Mercury is extracted in artisanal furnaces, exposing miners and their families to elevated levels of the pollutant. This source of mercury was responsible for 74% of total mercury emissions in Mexico (INECC, 2021).

Strengths

Mexico approved the Minamata Convention on Mercury, and there are efforts to eliminate mercury

In 2015, Mexico approved the Minamata Convention on Mercury (Global Environment Facility, n.d.), undertaking the responsibility of enforcing the convention throughout the Mexican territory. Enforcement includes the reduction and, when feasible, elimination of the use of mercury in artisanal and small-scale gold extraction.

Mexico's main mercury-producing region is Sierra Gorda of Querétaro, but there are other minor deposits in the states of Durango, San Luis Potosí, Jalisco, Zacatecas, and Guerrero. 146 active ASM mine sites have been found.

The current program is under the direction of the Transboundary Movements Subdirectory of the Minamata Convention Secretariat. It has USD 7 million in support from the Global Environment Facility and is co-financed by the Government of Mexico with another USD 50 million. This program establishes elimination dates and acceptable uses of mercury, proposes alternative livelihoods for miners in Querétaro, and organizes information and education campaigns on the risks of mercury. The convention establishes that Mexico must ban the creation of new mines, and the program establishes that by 2032 there should be no mercury mines.

There are several agencies working toward the implementation of the Minamata Convention, including SEMARNAT, SGM, INECC, and the Government of Querétaro. They operate mainly in the states of Querétaro, Durango, and Chihuahua to eliminate mercury used in gold amalgamation in artisanal mining and in mercury sourcing mining.

There is some technical assistance and funding for small-scale mining.

The Ministry of Economy, through the SGM and the FIFOMI, offers technical assistance and funding to ASM. The SGM provides technical assistance for small-scale mining on the evaluation of mineral deposits, metallurgical processes, and physical-chemical analysis of ore samples for its beneficiation (Section 9, para. VII, Mining Law). The SGM can certify mining reserves, and such certification can be used as a basis for funding.

The FIFOMI, under its Institutional Program 2020–2024, aims to increase funding to micro, small and medium-sized mining companies and their value chain, as well as improve the skills and capabilities of their human capital. This FIFOMI program is based on Axis 3 of Economy of the National Development Plan 2019–2024.

Weaknesses

There are no specific regulations or policies for ASM, and there is no categorization of ASM in the Mining Law.

Although ASM is a widespread reality in the country, the Mexican regulation does not facilitate ASM organization or sustainable development. In the Regulation of the Mining Law there is a short chapter entitled "Promotion of the Small- and Medium-Scale Mining Sector and of the Social Sector," but there is no other regulation or specific category for artisanal mining. Despite the DGM's scattered efforts to formalize artisanal and small-scale miners,

these workers do not want to be formalized, primarily because of the burdens of the permit system, taxes, and social requirements.

There is little information and data about ASM in Mexico.

Consistent policy and efficient government actions for ASM require reliable data on the ASM sector. Although there are several areas in the country where there are ASM operations, there is little information about ASM operations, their contribution to the local economies, their environmental and social impacts, etc.

This also means that the government has concentrated its policies on large and medium-scale mining as opposed to ASM, withdrawing the government's attention from thousands of small and artisanal miners who operate in unsafe and insecure conditions and cause severe damage to the environment.

There are no plans for formalization, management, or monitoring of informal mining operations.

The Mexican government does not have a plan for formalizing informal artisanal or small-scale operations. These activities are widespread throughout the country and are diverse in terms of the types of minerals they extract and the systems they use to do so. Thus, they are considered distinct and separate problems, despite sharing similar criteria for the size of operations, safety, environmental impacts, related illegal activities, mining activity as livelihood their communities, etc.

Management and monitoring are also poor. In some cases, as in the mining area of Querétaro, security conditions are such that government personnel cannot gain access to the mining sites. The FIFOMI's technical assistance is not aimed at formalization but at identifying miners that qualify for loans, and the SGM's technical assistance is limited.

There is a lack of policies to prevent and control ASM's illegal activities.

Mexico has no policies:

- Establishing minimum standards of health and education for ASM workers and their families.
- Seeking to significantly and verifiably reduce the number of children employed in artisanal mining and to introduce improvements in the working tasks and schedules they keep so that they can meet their educational needs.
- Seeking to strengthen, monitor, and enforce child labour laws in ASM.

Mexico's mercury mines are difficult to close, and they supply mercury to informal ASMs in other countries.

Primary mercury mining causes emissions to be released into the environment because it is conducted informally in Mexico (INECC, 2019). Mercury is still a mineral under concession, even though no new concessions are granted. With the enactment of the Minamata Convention in 2017, the Ministry of Economy reported the production of 804.6 tonnes of mercury from the state of Querétaro, according to concession holders' production reports (INECC, 2019). Currently, there are 189 documented mines in Sierra Gorda, 146 of which are active.

Even though the program resulting from the Minamata Convention states that mercury miners must be transitioned out of the industry, there are no alternative economic sources in the area to replace this activity. In addition, mercury-dependent miners are resistant to a change in their economic activity.

After the enactment of the Minamata Convention in 2017, reports on mercury production, import, and export showed a decline. However, most of the mercury simply began to be traded informally. Mexico is one of the main exporters of mercury, which is traded to countries such as Bolivia, Peru, Colombia, and Ecuador for artisanal gold and silver production (INECC, 2021). This causes serious environmental and health impacts in these countries. In the last few years, there has been an uncontrolled increase in mercury demand in countries in Central and South America.

There are serious environmental (including mercury), social, and safety impacts.

One of the main environmental and health impacts of ASM in Mexico is mercury emissions. From the initial evaluation of the Minamata Convention, primary mercury mining is the main cause of mercury emissions into the environment in Mexico, as this is an informal mining activity (INECC, 2019). In addition, in Sonora, small-scale mining activities use large machines to extract minerals from the Yaqui River, which has an impact on the river, as it increases the solids within it that are the result of environmentally uncontrolled activity.

On the occupational safety side, miners do not have safe working conditions, and they lack the necessary equipment and training to conduct their activities in accordance with the health and safety regulations designed for industrial mining.

In the absence of effective regulations or policies for ASM, there is no effective control of the activity. For instance, accidents occur regularly in coal mines. In Coahuila, 600 safety incidents are estimated for every miner killed. Between 2000 and 2019, about 2626 miners were permanently disabled. Despite all that, in a region of 160,000 inhabitants, about 3,000 families depend directly on the coal industry (Pardo Veiras, 2021). Inspectors close unsafe mines, but within days the mines are reopened due to a lack of profitable alternative livelihoods.

Child labour is also not effectively controlled in the context of ASM.

Small-scale mining is not that small.

The definition of “small-scale mining” in the Regulation of the Mining Law established higher maximum criteria for monthly extraction (15,000 tonnes) and minimum wages (5,000 times the minimum wage) than in other countries. This means that artisanal mining, for example, has no specific considerations in the Mining Law or regulations, and is subject to the same conditions as much larger industrial operations.

Photo: Epitacio Robledo

6.0 Analysis of Strengths and Weaknesses

Mexico has, in several ways, high international standards in mining and environmental matters. The legal system is based on a series of laws, regulations, and standards with strong environmental protections. The government and the private sector have excellent human resources and mining management equipped with modern elements that meet the highest international standards, such as geological information and transparency, modern taxation issues, and incentives for environmental compliance, among others.

However, managing the Mexican mining sector is not easy in a large country with a diverse and partially decentralized mining sector. The government is aware of the challenges, and it is open, from the highest government levels down, to learning and changing to improve policies and the implementation of laws and regulations, including regarding the request for this assessment.

Overall, regarding the **first theme** of the MPF, there is a solid legal basis to enhance the mining sector's contribution to sustainable development through the MPF theme areas with some exceptions in the regulations, such as considerations about mine closure, consultations, and ASM, which are insufficiently treated. In the permit process, several reports are requested to enable informed decision making, and certain socio-economic issues are considered in the process. Geological information is good and publicly available. Primarily, however, there is a lack of political decision making about whether Mexico wants to be a mining country. Like there has been in the past, a policy is needed to guide law enforcement, provide more certainty on granting permits, and strengthen the institutions that govern the Mexican mining sector.

Regarding the **second theme**, which refers to the optimization of financial benefits, Mexico has taken some steps toward greater transparency through its adherence to the EITI initiative. In addition, as a member of the OECD, Mexico also follows best practice recommendations on transfer pricing and tax base erosion and profit shifting. However, the allocation of mining revenue is problematic; revenues from mining activities do not reach the communities or the mining authority to finance mining activities. There have also been numerous changes in the taxation system for companies, which causes a lack of transparency and instability. Finally, the authorities do not have the technical capacities required to administer the tax system.

Regarding the **third theme**, socio-economic benefit optimization, the legal framework includes many tools to optimize those benefits and achieve the prohibition of child labour; provide incentives for gender equity, health, and safety regulations; and meet other obligations, such as training, local employment rates, and others. However, there is limited public and Indigenous consultation in the permitting process, and there is a lack of regulation, which leaves communities' and Indigenous Peoples' rights unprotected and jeopardizes the validity of administrative decisions. There is also a lack of open dialogue with NGOs. These types of actions could prevent conflicts in mining areas. Socio-economic planning is limited. Despite the existence of a wide range of regulations on gender equality, the mining sector does not have a gender equality policy or program. In addition, security and human rights in operations are not guaranteed by the government, an issue that is generalized for the entire mining sector operating in the country.

For the **fourth theme** of the MPF, the legal framework requires that authorizations include requirements to submit comprehensive inspection programs and financial assurances, specific biodiversity plans and reports, and incentives for companies to conduct voluntary external audits. Mexico has developed land-use zoning that allows for the coordination of the coexistence of mining with other activities and priorities. But, although the legislation is comprehensive, implementation is difficult due to a lack of oversight, resources, delays, or obstacles in the granting of permits, as well as a lack of consistent enforcement of the law. Specifically, among others, while there are water-quality standards, management and control are weak, and there are concerns from civil society about water consumption concessions. Despite being able to conduct mining activities in certain areas of PNAs, the management plans of many of these natural areas are behind schedule, which frustrates the approval process. Finally, there are requirements for contingency plans, but they do not cover all contingencies, local stakeholders are not consulted, and they do not meet current international best standards.

Regarding the **fifth theme**, the post-mining transition, Mexico has basic legal instruments covering mine site closure and environmental remediation, and some timid efforts have been made to manage abandoned operations through an inventory of tailings storage facilities. However, despite Mexico's long mining history, a systematic approach to mine closure is needed. On the one hand, mine closure provisions are scattered between environmental and mining regulations without a comprehensive system requiring companies to conduct a full technical mine closure plan from the initial stages of the project. The level of quality required for closure plans is inadequate with a lack of specific financial assurance for mine closures to cover the necessary expenses. Finally, there have been several cases of poorly closed mines in Mexico and a major concern for environmental liabilities, but without proper governmental effort to manage them.

Lastly, regarding the **sixth theme**, ASM, Mexico has scarce regulations and scattered actions that do not manage to cover the needs of this subsector. The regulation needs to be more detailed and lacks a comprehensive strategy to mitigate environmental and safety impacts, in general, to promote a sector that can be an engine for rural development. The lack of data about the ASM sector is the first key challenge, without which the implementation of any policies or strategies would be endangered. Also, specifically, the ASM that supplies mercury to many other countries in the Americas is a particular challenge that, although being addressed through the Minamata Convention, has not yet found a clear solution.


Photo: Epitacio Robledo

7.0 Recommendations

Improvements can be made in Mexico in all six MPF themes. The Mexican government's participation in this assessment process reflects its willingness and openness to improve the governance of the mining sector and to ensure mining's fullest contribution to sustainable development in the country. There are certain challenges at the macro level, such as the lack of a policy or planning for the mining sector or for creating greater legal certainty. Government decisions will have to effect substantial improvements to both mining regulations and their enforcement, both for the current state of the mining sector and for its potential growth.

The following recommendations are prioritized; however, they are not listed in order of relevance, as they all pose challenges for the governance of the mining sector that should be addressed with equal urgency.

Recommendation 1: Legal and policy framework – Permits and consultation

Mexico should develop modern policies and laws for the mining sector that provide clear obligations for both governments and companies and a clear vision of how the mining industry will contribute to the sustainable development of the country.

Mexico has good regulations, but they are disorganized and have some gaps. Gaps should be closed through modernized regulations on mine closure and consultation with communities and Indigenous Peoples. In general, the permitting process should be reviewed to consider interagency coordination that integrates consultation, the closure plan, assessments, and reports so that authorities can make informed decisions. Key recommendations are described in the following paragraphs.

First, Mexico should have a policy that includes large-, medium- and small-scale mining that contains well-defined terms. Mining policy should clearly define what type of mining industry the government would like to see in the following years and the role mining will play in the Mexican economy. This policy should include goals or an action plan to improve the management of mining resources. Policy-making should be participatory and consensual,

encompassing the entire mining sector (including NGOs) and all levels of government to be able to transcend administration changes. The issues that should be defined in the policy are:

- Strengthening governmental mining agencies with financial resources and better coordination among agencies
- Policy to attract sustainable and valuable investment for the country
- Gender policy
- Training the mining sector and strengthening its relationship with Mexican academia
- Better decentralization, including of taxation (which is currently centralized)
- Policy oriented to mining communities
- Stewardship of resources, including identifying the key minerals for Mexico

Second, Mexico needs to improve the mining and environmental permitting process and its coordination. The regulation in this area is not bad, but it contains gaps that should be closed to be considered modern, such as the integration of mine closure planning, consultation at the various stages, and separate procedures for granting exploration and exploitation concessions. It is important for the government to be able to guarantee the application of the law to the private sector, so that once the requirements of the law have been fulfilled, a permit is guaranteed to be granted. Achieving coordination between government agencies, addressing the lack of resources and personnel, and providing training for the assessment and monitoring of permits will also help to improve law enforcement. In some cases, the problem lies in the lack of enforcement of the law or guidelines.

Third, the law does not include a good consultation process. With the current approach, the government arrives late to developing conflicts, reacting instead of being proactive. Consultation is not used as an instrument to develop mining.

Regarding Indigenous consultation specifically, despite efforts to implement international conventions and treaties, current government practices are not consistent or aligned with international best practices for an effective prior consultation. There is an urgent need for the government to address this issue to prevent the escalation of community discontent and to comply with international commitments. This process should be prioritized.

Recommendation 2: Distribution of financial benefits

The current system for distributing the financial benefits of mining—which does not distribute these resources to states and districts where development activities take place—does not allow mining communities to see the benefits of mining development in their territories. Since the elimination of the Mining Fund, communities no longer receive local economic support for development. When financial benefits from mining activities reach the communities as socio-economic benefits (better services, infrastructure, etc.), this generally means that communities support the activity, and conflicts are avoided.

Currently, financial benefits from mining are absorbed into public expenditures (education and health) unrelated to mining towns or states. This is not consistent with international best practices. Benefits do not reach the mining authority to strengthen the promotion of mining activities.

There is a lack of transparency in the distribution of these financial flows, especially in knowing how governments spend mining revenues. The government should make tax and royalty data available to the public (e.g., through a public website), including the allotment and use of funds at the local, regional, and national levels. Transparent data on revenues, particularly how revenues are distributed and used at the local, regional, and national levels, is key to increasing accountability, reducing corruption, and maximizing socio-economic benefits. The revenue distribution system should be more permanent than the current one.

Local communities should be engaged in determining how benefits are allocated by identifying a distribution process widely perceived by the community as fair and developing and using community capacity to monitor local distribution. As part of fair mining revenue distribution, the government could also consider making community development agreements between companies and the community and/or establishing special funds for mining communities. Each of these options should be carefully designed, implemented, and monitored to ensure success.

Recommendation 3: Mine closure

Mexico's leaders and the public should become aware of the importance of having mining projects that plan closures and post-mining transitions that meet the highest international standards. Any country intending to develop a sustainable mining sector should have clear and precise laws and regulations on the obligations of companies relative to the closure and post-closure of mining projects. A lack of specific regulations will result in increased environmental and social liabilities from mining. Mexico will not be able to assume the excessive costs of mine closures, but they can be avoided by having clear regulations that include adequate financial assurances. Closure and post-closure are part of a mining project and should be included in the investment costs of the project.

Currently, mine closure has insufficient legal status, as it is mentioned only in guidelines; the importance of mine closure should be reflected in a law, thus increasing its relevance.

First, the government should take care of abandoned mines and their environmental and social liabilities. This includes planning and seeking financial resources and partners. Above all, the government should be able to differentiate abandoned mines from liabilities.

Second, so that no further liabilities are generated, robust closure and post-closure regulations must be created, with closure plans and financial assurances required prior to construction and updates required as the project progresses. Mining closure and post-closure regulations must include at least the following:

- Preparation of the closure and post-closure plan: For this to be effective, the government should draw up detailed guidelines.
- Processing: The regulation should clearly state what authority is entitled to settle any claims or set time frames.
- Regular review: The regulation should include regular review of closure and post-closure plans. The usual review period is every 5 years.
- Costs of closure and financial assurance: The regulation should include the requirement for companies to submit their calculation of closure costs in detail in order to correctly determine the amount of financial assurance required from

any company that intends to develop a mining project in the country. The financial assurance should cover all project closure and post-closure investments and costs.

- Closure audits: External, independent audit mechanisms for the implementation of the closure plan must be established.
- Closure plans for the ASM: Regulations should include some kind of closure plan for the ASM sector. Due to ASM's size and financial resources, such projects need special treatment. This will ensure that all mining companies comply with closure and post-closure regulations.

At the same time, in order to implement specific closure and post-closure regulations, government and oversight agency personnel must be trained in coordination with the mining agency to monitor closure.

Recommendation 4: ASM

ASM is a large and diversified sector in Mexico with complex challenges. The ASM sector has received little attention from the government and its regulations. First, the government needs to understand the economic importance of ASM and generate data, which is currently very scarce or non-existent. Without data, any decision could fail.

Second, there is a need to create a specific policy or strategy for ASM aimed at development—or, if that's not possible, at least better management of this subsector. A policy developed in consultation with the ASM sector should consider geographical diversity, minerals, value chain stakeholders, sizes (from artisanal to small), and the complexity of their specific challenges. A robust policy should be decided in consultation with the ASM stakeholders. This strategy will result in actions such as formalization possibilities, training, and funding for the ASM sector (aligning current efforts), simplification of procedures throughout the value chain, the definition of differentiated taxes, government actions in the face of unacceptable practices and ties with other illicit activities, a traceability system for illegal trade, and control of mercury emissions (in coordination with the efforts of the Minamata Convention), etc.

There is also a need to improve regulation through criteria differentiating the several types of mining within the ASM sector to reflect its reality. Differentiation is necessary for making decisions regarding each group, as artisanal mining may have quite different capabilities compared to small-scale mining in Mexico.

Beyond the political decision to develop or manage ASM, there is an urgent need to improve control over monitoring the current environmental impacts and health and safety risks of the ASM sector, especially in the use of mercury. At present, ASM is not on the monitoring radar: it does not receive oversight corresponding to the potential impacts of ASM activity, which is already showing high costs. A safe, sustainable, and supervised ASM sector should be attained.

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Annex: List of stakeholders consulted

Government

- General Directorate of Mining Development of the Extractive Activities Unit of the Ministry of Economy
- General Directorate of Mines
- Geological Mining Service
- Mining Development Trust
- Ministry of Environment and Natural Resources
    - National Water Commission
    - National Commission for Protected Natural Areas
    - Directorates: General Directorate of Environmental Impact and Risk, General Directorate of Forestry and Soil Management, Coordinating Unit of Delegations, General Directorate of Federal Maritime-Terrestrial Zone and Coastal Environments, Coordinating Unit of Social Participation and Transparency, General Directorate of Environmental Policy and Regional and Sectoral Integration, Directorate for the Management of Materials and Hazardous Activities.
- Municipality of Cananea

Civil Society

- Oxfam Mexico
- Project on Organizing, Development, Education, and Research (PODER)
- Publish What You Pay

Private Sector

- Grupo México
- Fresnillo plc
- Newmont
- Minera Cuzcatlán
- Capstone Gold
- Mining Association of Mexico
- Miners' Association of Zacatecas

Others

- Mining Cluster of Sonora

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