

Armenia
AN EXECUTIVE SUMMARY

**Sustainable and Strategic
Decision Making in Mining
&
Enhancing Environmental and
Social Sustainability of Mining**

INTRODUCTION

The World Bank produced two thematic papers on the mining sector in Armenia aiming to provide a practical and user-oriented overview of the environmental and social aspects associated with the industry and with the purpose to inform policy makers, government officials and mining industry representatives of global trends that ensure sustainability in mining. Private sector stakeholders and civil society groups could also use the recommendations to guide best practices in the sector and hold the government accountable for reforms.

The first paper, *“Sustainable and Strategic Decision Making in Mining,”* seeks to inform Armenia’s policy dialogue on environmental and social issues in the mining sector. It looks at the environmental and social costs and benefits of mining, and focuses on higher-level regulatory strategic planning. This paper is based on the premise that for the mining sector to have positive, long-term impacts in Armenia, it is necessary to take into consideration its short- and long-term environmental and social impacts and promote strategic planning and efficient management of natural resources. This paper was completed in January of 2014.

The second paper, *“Enhancing Environmental and Social Sustainability of Mining in Armenia,”* seeks to mainstream and enhance the understanding of environmental and social sustainability principles in the development of Armenia’s mining sector. This paper was completed in June of 2014.

MINING IN ARMENIA

Armenia boasts an abundance of specific subsoil mineral resources, in particular metals such as copper and molybdenum that are highly sought after on the global market. In 2011, Armenia was a significant producer of molybdenum and ranked seventh in the world in mine output. Besides molybdenum, Armenia produces other metals, including copper, gold, silver and zinc, as well as other industrial minerals such as diatomite, gypsum, limestone, perlite and rhenium salt (potassium perrhenate). Armenia also has valuable resources of other minerals such as basalt, granite, limestone, marble and tuff; semiprecious stones, such as agate, jasper and obsidian and other non-metallic minerals, such as bentonite, diatomite, perlite and zeolites¹ As such, the mining industry is a significant driver of the economy. The International Monetary Fund indicates that Armenia’s economic growth increased to 7.2 percent and remained strong in 2013 predominantly due to the mining, services, and agriculture sectors.² In 2011, mining products, precious metals and stones, and nonprecious metals and items manufactured from them amounted to more than half of the total exports of goods (55.2 percent)³ from Armenia.

FDI in the mining sector rose to 45.6 percent between January-September of 2012 from 10.4 percent in the same period in 2011. Most of these investments were made in acquisition and expansion of already operational mines and the results were visible in a short period of time. In 2011, Armenia produced 30 percent more gold than it produced in 2010. Furthermore, production of salt increased by 21.09 percent; that of primary copper metal by 16.12 percent; molybdenum concentrate by 11.12 percent; molybdenum metal by 11.09 percent; barite by 9.09 percent; zinc

¹ U.S. Geological Survey. *2011 Minerals Yearbook: Armenia (Advance Release)*. Washington, D.C.: U.S. Geological Survey. 2013.

² IMF (International Monetary Fund). 2013. *IMF Country Report 13/238, Republic of Armenia*. <http://www.imf.org/external/pubs/ft/scr/2013/cr13238.pdf>.

³ UNDP (United Nations Development Programme). 2012. *Armenia Development Strategy for 2012–2025*. Report. Yerevan.

concentrate by 8.54 percent; copper concentrate by 8.16 percent; and ferromolybdenum by 7.78 percent. At the same time, production of caustic soda decreased by 93.44 percent; and gypsum by 12.14 percent.⁴ An increase in global commodity prices for copper, gold, molybdenum, and other valuable metals is expected to further boost investment in the mining sector as well as the demand and drive for the development of this sector.

The mining industry is expected to create jobs and improve infrastructure, but the potential for large-scale, short-term economic gains through investment in the sector often overshadows the likely impact on the environment and local communities. Without a proper and well-enforced sustainability framework and plan in place, these impacts can be significant.

Table 1: Examples of Mining Impacts with the Potential to Become Cumulative

NEGATIVE IMPACTS	POSITIVE IMPACTS
<ul style="list-style-type: none"> • Potential for long-term environmental degradation and resulting impacts on health and livelihoods • Reduced water quantity (groundwater draw and water table impacts from multiple mines and industries) • Land loss and loss of income from traditional sources of livelihoods • Weakening of other sectors (agriculture, mining) • Price inflation (for example, housing and rents) and disproportionate impacts on residents not employed in the mining industry • Overloading of existing social services (for example, child care, health care, and education) • Increased dust and associated air quality issues • Traffic congestion and road degradation 	<ul style="list-style-type: none"> • Increased employment and economic investment • Local business development from mine procurement • Road and infrastructure upgrades • Investment in biodiversity offsets and rehabilitation • Population increases that create a critical mass for better services and infrastructure (for example, schools and sporting teams) • Development of human capital (skills, employment, and training)

Source: Franks et al., 2010

Ramping up the mining sector in Armenia has to be accompanied by measures for inclusive and environmentally sustainable economic growth. Putting these measures in place could require far-reaching reforms in decision-making processes and supporting tools even before the right policies are formulated.

A) SUSTAINABLE AND STRATEGIC DECISION MAKING IN MINING

The mining sector in Armenia has yet to adopt global best practices. This paper provides guidance on some of the mechanisms that can be adopted to improve the governance and overall impact of mining in the country.

Several reforms recently launched by the government of Armenia — in the mining sector and the environmental legislative framework — present an opportunity to use the synergies and benefits of putting the sector on a sustainable path.

⁴ U.S. Geological Survey. *2011 Minerals Yearbook: Armenia (Advance Release)*. Washington, D.C.: U.S. Geological Survey. 2013.

With the assistance of the World Bank, the government of Armenia has developed a **Mining Code** that emphasizes the importance of certain environmental and social considerations that could increase the potential for mining to lead to sustainable development.

Greater transparency could be achieved through the option of joining the **Extractive Industries Transparency Initiative (EITI)**, which would help the government strengthen the revenue management, in line with international good practices, as well as the sector governance.⁵

The government is revising the law on the **Environmental Impact Assessment (EIA)** to reflect good EIA international practice.⁶ This will include improvements in the methodology for impact assessment and economic valorization of environmental damages, reviews and enforcement of EIA implementation, and improved transparency and public participation. The new law will address long-standing concerns regarding direct financing linkage between the State Environmental Expertise⁷ reviews and fee payments levied on the EIA review procedure.

Several other tools and mechanisms can also be put in place to promote adoption of international best practice in the mining sector. These include (i) policy tools promoting sustainability based on impact and risk assessment and mitigation, and (ii) economic valorization of environmental damages.

1. Policy tools

Cumulative Impact Assessments (CIA) aim to look at the broader development context of a given mining activity or strategy. It would serve to identify potential interactions between existing and proposed projects, identifying direct or indirect impacts including cumulative impacts of given development options. This approach allows for early identification and mitigation in the selection and design of sector policies, rather than downstream through project management and end-of-pipe solutions.⁸

Strategic Environmental and Social Assessment (SESA or SEA) is a distinct but complementary process to the standard EIA. The EIA process can help better define project design, whereas the SESA helps define and increase environmental and social sustainability of a strategy. Applying a SESA to devise a mining sector strategy that balances pro-growth objectives with environmental and social sustainability could inform decision making at all levels of the administrative hierarchy.

By using EIA, CIA, and SESA, decision makers can achieve potentially large gains to provide regulatory response to development risks and devise measures to protect the environment and society in multiple ways, and throughout all phases of the project. The processes of CIA and SEA are showcased in examples from other countries in the first paper.

⁵ World Bank. 2010. *Armenia—Second Development Policy Operation Program*. Report. Washington, D.C.

⁶ World Bank. 2013. *Armenia—First, Second, and Third Development Policy Operations Project*. Report. Washington, D.C.

⁷ World Bank. 2009. *Armenia Country Environmental Analysis: Institutional Capacity, Incentives and Constraints*. Report. Washington, D.C. (unpublished).

⁸ World Bank. 2011. *Strategic Environmental Assessment in Policy and Sector Reform Conceptual Model and Operational Guidance*. Report. Washington, D.C.

2. Economic valorization of environmental damages

Unless adequate fees are collected and channeled back to the mining communities to repair damage to the environment, it will be impossible to ensure long-term development through adequate mitigation of impacts. Such an approach would be based only on short-term gains from the mining industry, not accounting for long-term impacts. Policy makers and decision makers need to make informed choices and set the evaluation process and assigned rates at a level sufficient to address the impacts from mining industry and stimulate behavior changes.

Policies that arbitrarily manipulate the cost of environmental degradation by keeping relatively low rates of environmental payment do not credibly reflect the genuine economic value of the resource and cost of environmental damage. Specifically, the **Law on Targeted Use of Environmental Charges Paid by Mining Companies does not have provisions for payment of fees for the disposal of mining residues and tailings dams**. Assigning responsibility for safe management of the tailings dams and a plan for time-bound reuse of the tailings would be in line with environmentally sound management practices.

The current system in which environmental payments, fees, and “compensations” for environmental damage are accumulated in the state budget has at least **two main shortcomings**:

- (i) The funds are used in a highly centralized manner;
- (ii) More than half of the resources collected for environmental protection purposes are used to finance other priorities.

Table 2: Valuation of Ecosystem Services in the SEA

SEA process	Gains in SEA process from valuation of ecosystem services
Screening	<ul style="list-style-type: none"> Economic valuations more clearly highlight the implications of ecosystem services for human well-being.
Scoping	<ul style="list-style-type: none"> Mapping the relationship between ecosystems and the current or potential stakeholders (in terms of benefits) can influence the definition of the goal and scope of the assessment.
Identification and evaluation of impacts	<ul style="list-style-type: none"> Analysis of the conditions and trends of relevant ecosystem services. Costs and benefits for the different stakeholder groups of ecosystems changes.
Comparing options <ul style="list-style-type: none"> Prioritization Mitigation 	<ul style="list-style-type: none"> By considering the economic valuation of ecosystem services, policy appraisals can take into account the full costs and benefits of the proposed measures. Alternatives and scenarios gain more distinctive features.
Monitoring	<ul style="list-style-type: none"> Integration of ecosystem service-related indicators into monitoring systems.

Source: Authors

Challenges

Armenia may fall prey to the “resource curse” without a strategy that assigns higher priority to optimal use of mineral resources as a long-term driver for growth and socioeconomic development over immediate increases in productivity. In order to avoid this scenario, before scaling up development of mines, the government of Armenia could consider:

- (i) Scaling up efforts for addressing the challenge of sector governance with regard to environmental and social impacts;
- (ii) Reform the legal oversight practice, ensure sector transparency, and effective enforcement mechanisms applicable to all mine operators to ensure they conduct operations in line with the best international mining practices.

B) ENHANCING ENVIRONMENTAL AND SOCIAL SUSTAINABILITY OF MINING IN ARMENIA

The presence of international mining companies in Armenia, in particular those that have strong corporate policies and procedures for environmentally and socially responsible mining, is encouraging. Their track record coupled with well-developed public policies for sector sustainability and good governance is key to positive development of this industry. However, the ongoing concern with the environmental compliance of old mines is of no lesser concern. Many old and abandoned mining areas, in particular tailings dams and depots, do not showcase the best of practices for protection of local environments which is a deterrent and portrays a negative image of the industry. The environmental legacies of these sites need to be addressed while the new developments in country need to follow a well-established and regulated path of environmentally and socially sustainable mining. Historic and abandoned mining sites need to be addressed through an individual closure, cleanup and remediation action plan. Recommendations set forth in this paper deal with new mining developments.

(i) Improved Environmental and Social Performance in Mining Sector

An overview and comparative analysis of the main environmental and social requirements in place via the Mining Code, in a number of mineral-rich countries where mining is a sizable economic sector, covered issues such as licensing, management, and concessions all the way to mine closure and tailings management. The countries used for comparison include Finland, Australia and Kyrgyzstan. The analysis indicates that community outreach programs, environmental management systems, and corporate responsibility, along with self-monitoring, life cycle planning of a mine, closure planning, and environmental auditing are just some of the practices that international corporations bring to resource rich countries years before such requirements are included or required to be added in local legislation.

Among the key elements of sustainability is transparency. As a signatory to the Aarhus Convention on the Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters,⁹ Armenia is obligated to provide information to all interested stakeholders. A current lack of transparency, however, is evident from:

- a) Limited availability of information for the mining sector;
- b) Decision making without the involvement of a broader stakeholder audience;
- c) Inadequate information sharing and lack of information regarding how environmental and social impacts are identified and addressed.

⁹ Armenia signed the Aarhus Convention in 1998 and ratified it in 2001.

The paper also looks at technological development from the perspective of companies as well as regulators. Its recommendations are aimed at ensuring better and stronger support and coordination between the regulating agencies, and achieving better data collection and monitoring practices.

(ii) Environmentally and Socially Sound Management of Mining Tailings

In Armenia, mine tailings are considered a valuable resource due to the potential to extract the remaining ore. An operator's obligation to responsibly manage such tailings facilities is not clearly defined and because tailings have no financial value to the mine operator at that particular point in time,¹⁰ they are typically stored in the most cost-effective manner that meets the bare minimum of regulations. Mining operations require a substantial amount of soil or rock cover (called overburden or waste rock) to be removed to access the ore. A large quantity of overburden is excavated in comparison with the amount of ore that is extracted, but this is usually fairly stable and does not pose a significant threat to the environment.

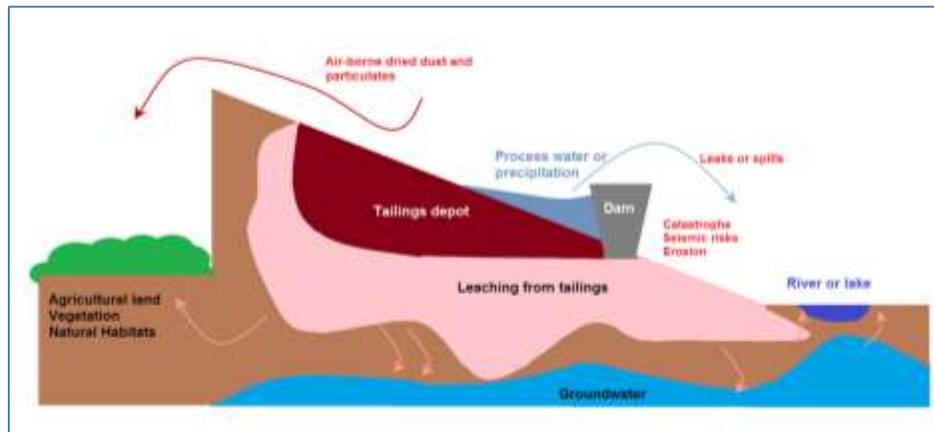
Mine tailings may, due to the nature of mines and composition of the surrounding soil, react when exposed to oxygen and water. As a consequence of this reaction, the tailings may generate acid, leachate containing heavy metals and other compounds that are extracted with the ore. This can cause substantial degradation of the water, air, soil and flora and fauna in the vicinity of the mining activity. Through the pollution of groundwater or surface water, the acid (acid mine drainage [AMD] or acid rock drainage [ARD]) and leachate may reach areas farther than the ones in the immediate vicinity of the mined areas or tailing dams/deposits. Construction of tailing dams or confinements often presents an additional risk of landslides or potential collapse due to seismic activity, which can cause substantial damage.

Environmental and social impacts of mine tailings can be mitigated and properly addressed if an integrated management framework to do so is established and operational. Besides land use, noise, dust and vibrations that are the most readily recognizable impacts of mining, the key issue and impact arises from the amount of excavated material and the remnants from mine operations — mine tailings. A significant quantity of tailings is produced as a byproduct of processing and extraction of the ore. Regulating the residues from on-site ore processing requires more stringent regulation especially when production processes uses chemicals that could cause pollution of water resources that may not be immediately detectable.

Social risks range from the very immediate ones of decreased land value, impacts on the agricultural lands or other development options (in particular when mining operations are being carried out in the vicinity of developments such as tourist/spa centers), associated health risks, reliance on the mining industry and moving into more strategic and long-term impacts such as the development of sector-specific skills, reliance on the mining industry and planning for the eventual mine closing.

¹⁰ One of the main reasons behind mine tailings being “stored” and not permanently managed as waste is the fact that they could be reprocessed sometime in the future. At a given point in time, when the further extraction of smaller fractions of ore from tailings is not economically viable, the tailings have no value to the mining operator.

Figure 1: Schematic overview of the main environmental impacts associated with mine tailings



Source: Authors

Armenian Development Agency (ADA) reported that the biggest concentration of mines is in the Lori, Kotayk, and Syunik *marzes*¹¹; mines are also present in the Gerharkunik, Vayots Dzor, and Aragatsotsn *marzes*. There are 17 tailings ponds for disposal of residue, 10 of which are operational; these cover an area of almost 700 hectares, according to the Ministry of Energy and Natural Resources.

This paper provides guidance on sound environmental management practices for the tailings, regardless of whether the tailings would be processed or disposed of in the long run. The guidelines would need to include provisions for the following:

- (i) Minimizing the physical footprint;
- (ii) Managing dust;
- (iii) Controlling leaching of hazardous elements;
- (iv) Controlling access to the site.

From an enforcement perspective, the guidelines would need to include:

- (i) Necessary steps required for self-monitoring;
- (ii) Third-party monitoring;
- (iii) Ensuring compliance with relevant laws and permits;
- (iv) Deliberating a cut-off date by which the tailings would need to be reprocessed in order to avoid being considered a waste material.

The review of mining legislation in a number of countries focuses on the best available practice which could be implemented in Armenia. This includes legislation, acts, guidelines, and best available techniques from the United States of America, Canada, and the European Union, with practical guidelines from the Environment, Health, and Safety (EHS) guidelines of the International Finance Corporation (IFC). In particular, the global mining industry corporations as well as international financing institutions act as a vector for rapid sharing of best practices, especially those related to sustainability.

¹¹ Armenia is divided into 10 *marzes* or provinces.

Best practices in technology and development, in particular those that relate to new treatment methods, information sharing, planning, and post-closure practices, including monitoring are outlined further in the paper. A common set of guidelines across the board deal with life-cycle assessment and planning, early-on mine closure planning, tailings management facilities (TMFs), siting, design and stability, prevention and control of ARD, water control, improved cyanide control, and after-closure management and monitoring.

RECOMMENDATIONS

Several sets of recommendations emerge from the “*Sustainable and Strategic Decision Making in Mining*” and the “*Enhancing Environmental and Social Sustainability of Mining in Armenia*” papers. These recommendations aim to inform the government policies and promote sustainable development of the mining sector and environmentally and socially sound management of mine tailings. The recommendations are formulated in two stages — either as a high-priority measure or a medium-term measure. The priorities are not assigned based solely on their importance, but also on whether they require certain preconditions to be met or imply a long-term development process.

These recommendations are:

- (i) *Enhance strategic planning through development of an SEA for the mining sector*

Responsibility: Ministry of Nature Protection in close coordination with the Ministry of Energy and Natural Resources

Level of Priority: Medium; Along with a strategic planning documents for mining development which is prepared through a continuous and inclusive process

An SEA would be used in parallel with the development of a formal mining-development strategy. The inputs and provisions that are provided in the SEA would be able to feed into the strategic document and vice versa, and the two should be interlinked. Case studies in the “*Sustainable and Strategic Decision Making in Mining*” paper show that SEA processes have led to:

- Heightened attention to environmental priorities;
- Strengthened environmental constituencies;
- Strengthened dialogue and constructive public involvement; and
- Improved social accountability.

The SEA would facilitate the understanding of cumulative long term risks and impacts of mining development from a perspective that is higher than a simple EIA or multiple EIA studies. The SEA will look at each of the mining developments, clusters of mines, aggregate impacts, and direct and indirect interactions between impacts. It would also help establish the development priorities based on economic, social, and environmental gains. The entire process of an SEA is established in a manner in which transparency, involvement of all stakeholders, and public input is ensured and valued.

An SEA cannot be perceived as a one-time obligation. It is a process involving a broad spectrum of stakeholders that allows for constant feedback to improve the environmental and social sustainability of the mining sector.

(ii) *Improve legislation and practice on Cumulative Impact Assessments and ecosystem valorization*

Responsibility: Ministry of Nature Protection

Level of Priority: High; can be combined with the revisions of the EIA law

The genuine economic value of natural resources, ecosystem services, and environmental damage needs to be assessed and calculated while using a more up-to-date methodology for such practices. The guidelines must be clear and transparent, leaving little room for manipulation of the cost of environmental degradation. The policies and methodology stipulated under the **Law on Targeted Use of Environmental Charges Paid by Mining Companies** need to be revised and updated in line with current international practices.

CIA is a process that is an integral part of an SEA for the overall strategic development of mining. Furthermore, sections on CIA need to be incorporated into the **Law on Environmental Impact Assessment**, where development of one mine and its associated environmental impacts will be located in a given geographic area and the potential for cumulative impacts associated with other mines or other development in the area will be assessed. Establishing clear guidelines for CIA within the EIA process may also help develop the analysis of different development alternatives, which are an integrated part of the EIA and environmental permitting processes.

The use of funds for environmental protection and potential environmental damage is stipulated in the mining legislation and related legal acts. Many countries stipulate the required amounts allocated in the state fund as a percentage of the operator's environmental protection budget. **It is recommended that precise use of the state funds be tied in to the results of the EIA and environmental management plan (EMP) concerning separate mining processes.** This will also require efficient monitoring of environmental performance of mining companies.

(iii) *Facilitate dialogue and information sharing*

Responsibility: Ministry of Nature Protection and Ministry of Energy and Natural Resources

Level of Priority: High due to public concerns over mining development

Environmental and social sustainability need to be part of a dialogue among a number of institutions that represent the regulatory and planning authorities and the mining industry. Effects that can be felt by the population need to be communicated to citizens and local NGOs, their inputs need to be systematically collected, and mining companies and government authorities need to respond to the feedback of these stakeholders. This step can also help establish mechanisms for the assessment, management, and monitoring of cumulative impacts. In addition, for policy-level SEA to have an impact in the long term, there is a need for local capacity development for environmental priority setting.

Facilitating dialogue and information sharing will also help ensure transparency and accountability which are the pillars of good governance of the sector.

(iv) *Join the Extractive Industries Transparency Initiative (EITI)*

Responsibility: Ministry of Energy and Natural Resources

Level of Priority: High

Efficient management of resource revenues is integral to ensuring inclusive growth and sustainable development. If managed properly, resource revenues can be used in infrastructure

development, environmental restoration, and economic and social rehabilitation of populations impacted by the activities of extractive industries.

The EITI's transparency principles provide stakeholders with vital information on economic, social, and environmental aspects and could inform the dialogue between stakeholders on sector-specific policies.

The EITI is based on the concept of the extractives industry value chain. It includes a five-step process to improve the impacts of the mining sector on development and to support the sustainable growth of the sector. The five steps include: (a) discovering a mineral resource; (b) awarding a concession and license; (c) strengthening regulatory oversight leading to efficient

The EITI can greatly improve governance of the mining sector.

EITI-implementing countries benefit from an improved investment climate, providing a clear signal to investors and international financial institutions that the government is committed to greater transparency. The EITI also assists in strengthening accountability and good governance, as well as promoting greater economic and political stability.

Companies benefit from the EITI since the process mitigates political and reputational risks. Political instability caused by opaque governance is a clear threat to investments. In extractive industries, where investments are capital intensive and dependent on long-term stability to generate returns, reducing such instability is good for business. Transparency of payments made to a government can also help demonstrate the contribution that such investments make to a country.

Benefits to civil society come from increasing the amount of information in the public domain about those revenues that governments manage on behalf of citizens, thereby making governments more accountable.

Source: EITI website

Figure 1: Benefits of EITI

depletion of the resource; (d) leveraging investments in the extractive industry to achieve economic development; and (e) enabling broader economic diversification in the economy.

(v) Ensure shared prosperity and local development

Responsibility: Ministry of Energy and Natural Resources with Ministry of Nature Protection

Level of Priority: high – (long-term process)

Benefit sharing, or shared prosperity related to mining, is one of the key elements in sustainable strategies. Such processes are easily integrated into the SEA process and help define the associated benefits, costs, risks, and responsibilities related to mining while also establishing a future plan to ensure such benefits are adequately shared.

In countries where resources have led to positive social impacts, governments have in place clear safeguards that protect populations impacted by a project's activities. These safeguards were based on providing adequate compensation for land used for mining and offering assistance to the affected population to rebuild sources of livelihoods, among other things. Such safeguards and support were differentiated from the benefits to the communities as a result of revenue collected

by the government and given to the actual communities. Further assistance needs to be provided that would not only help mitigate current effects, but help combat health issues that can be linked to mining activities. Disaster risks that can be amplified due to mining operations also need to be addressed.

The issues of employment, skills development, and the distribution of power in local communities also need to be carefully planned and addressed. Modern compensation policies for people affected by projects should involve not only basic compensation for lost assets and lost access to resources, but also measures aimed at enhancing the livelihoods of the affected populations in the long term. This has been recognized in various national legislations as well as in international compensation policies and guidelines.

(vi) Enhance cooperation and better staffing practices in the responsible ministries

Responsibility: Ministry of Energy and Natural Resources and Ministry of Nature Protection

Level of Priority: High; long-term process

Having professional and dedicated staff to follow global development and improvements in the environmental management practices related to mining is critical for ensuring Armenia is implementing the most up-to-date and enhanced environmental protection measures. Furthermore, the Ministry of Energy and Natural Resources and the Ministry of Nature Protection need to engage in continuous dialogue so as to achieve the synergy necessary for developing environmentally and socially sustainable mining solutions. This cooperation can only benefit from having a designated staff member, or even a whole unit, handle mining issues in particular. Once a staff member or unit is fully dedicated to one industrial branch (mining) they can build their own professional expertise, easily follow the most recent global technological developments, and fully view the economic, social, and environmental impacts of such developments. Furthermore, tracking global developments and new practices and technologies to help mitigate the associated impacts will strengthen cooperation.

(vii) Improve monitoring practices, enforcement and data collection, analysis and disclosure

Responsibility: Ministry of Nature Protection and Ministry of Energy and Natural Resources

Level of Priority: High; long-term process

A main constraint to developing these thematic papers was the lack of available and up-to-date information and data. The limited data, measurements, and figures that are available come from relevant government agencies, private mining companies, international companies that are involved in Armenia's mining industry, and from articles written by and analyses conducted by independent experts or nongovernmental organizations (NGOs).

Armenia lacks a central registry of data on the operating mines, the management of tailings, and their environmental and social impact. The existence of such a register would help ensure regular monitoring practices and help enforcement agencies conduct inspections. The register should feature well-organized and structured databases; certain sections of it would ideally be made available to the public, which would boost public awareness and knowledge of mining-associated impacts, ways these are measured, and how they are mitigated. Increased public awareness can also help generate more constructive dialogue between all stakeholders, in particular for drafting strategic documents hinged on sustainability, such as the SESA.

(viii) Develop specific guidelines for sustainable mining

Responsibility: Ministry of Nature Protection with Ministry of Energy and Natural Resources

Level of Priority: Medium; long-term process already initiated

Sustainability policies are accompanied by substantial guidance on implementation and sound practices applicable to all of the individual mining processes, as well as to overall mining development. In particular, countries such as Australia and Canada have very strong and well-established guidance notes and literature, which have been used to develop this paper. A general conclusion of the literature is that strong expert presence on the ground needs to be ensured to tailor the guidance to a given mine in a given country, and to make sure the technological solutions are a good fit for a particular operation. This recommendation can be developed by a strong expert staffing or a dedicated unit within the two ministries — the Ministry of Energy and Natural Resources and the Ministry of Nature Protection, and can only be implemented once recommendation (vi) is fully implemented and (vii) is partially implemented.

First steps in this general direction are being made by the government of Armenia, in particular with the guidelines that will be further developed and are aimed at supplementing the Mining Code, but also through the Operational Manual that the Ministry of Nature Protection had drafted in 2011, tackling a number of mining-related issues and impacts. The key point of this recommendation, as well as the overall paper, is to ensure harmony between various requirements and proper compliance with the legal provisions.

(ix) Establish sound environmental management of tailings facilities or depots

Responsibility: Ministry of Nature Protection with Ministry of Energy and Natural Resources

Level of Priority: Medium; long-term process

The overall recommendation of the “*Environmentally and Socially Sound Management of Mine Tailings*” paper is to ensure sound environmental management of mine tailings depots, ponds, or simply TMFs, coupled with regular and thorough monitoring practices that would be established and carried out for the mine’s lifetime by its operator. After closure, monitoring and supervision would be conducted by the regulating agencies (ministries) to ensure minimal, if any, environmental impact as the tailings await processing. The associated costs and responsibilities need to be defined in the mining rights contracts, as included in the pertinent legislation.

(x) Develop mine tailings facility or depot registry

Responsibility: Ministry of Nature Protection with Ministry of Energy and Natural Resources

Level of Priority: High; includes harmonization of different data

Mine tailings data made available by the Ministry of Energy and Natural Resources needs to be continuously updated and revised to reflect the situation on the ground. The existing sites need to be adequately assessed and reviewed based on long term environmental risks and impacts. Future mines need to incorporate sound tailings management practices in their EIAs and ensure that such sites/facilities are properly monitored. Baseline data for any new development is an essential

requirement against which all subsequent monitoring measurements will be conducted. The information for existing, new, and yet-to-be-developed tailings facilities will be combined into one registry that will be equally managed and reviewed by the Ministry of Energy and Natural Resources and the Ministry of Nature Protection. The Ministry of Energy and Natural Resources needs to ensure adequate treatment of the potential secondary resource, while the Ministry of Nature Protection needs to be involved to ensure minimal, if any, associated environmental impacts, as proven by the monitoring results.

Among the key elements for developing a registry are (a) to adequately staff and delegate responsibility in the ministries; (b) establish presence in the field, coupled with on-site assessments, documentation preparation, quantities estimates, and clear delineation of locations using GPS coordinates; and (c) provide expert assessment of the major environmental issues and potential risks associated with the tailings depots. Based on this information, a mine-specific Tailings Management Framework will be developed.

(xi) Ensure implementation of monitoring plans and develop remediation plans for existing facilities

*Responsibility: Ministry of Nature Protection with Ministry of Energy and Natural Resources
Level of Priority: High; already initiated*

A number of remediation actions could be undertaken based on the registry of mine tailings facilities or depots with an objective to properly managing the mine tailings facility and decreasing environmental impact, as well as mitigating any environmental damage that has already been sustained. Monitoring information needs to be subject to public disclosure and regular updates. A lack of current information can serve as a red flag to ensure monitoring is being conducted and that the results are satisfactory.

MOVING FORWARD

Effective implementation of the good environmental and social governance in the mining sector requires strong regulatory oversight and clear, transparent rules applicable for all mining operators for reporting and monitoring, and should include the participation of communities affected by mining. Shortage or lack of publicly available information on such programs was one of the limiting factors in the development of these thematic papers.

With the number of reforms currently being undertaken in Armenia, first and foremost the implementation of the new Mining Code (2011), the subsequent environmental and social guidelines, the adoption of the new EIA law, and the secondary legislation supporting sustainable tailings management and monitoring of mining facilities,¹² would be the first row priorities to

¹² For example, the Armenian government decree issued January 10, 2013 on monitoring procedures in the area of mining operations and tailing dams to ensure safety and health of the population in neighboring communities and the Operational Manual on secure management of tailings in Armenia developed by the Ministry of Nature Protection in 2011.

improve the overall climate for sustainable mining practices in Armenia. While first steps in this direction are positive, the government needs to continue steadily in this direction. The recommendations made in this series of thematic papers are aimed at helping Armenia travel further along this path. By integrating sustainability and economic growth objectives, Armenia would be able to manage its natural resources in a manner that shall ensure intergenerational shared prosperity, sound environmental protection and development in its truest sense — without costs to any other sector or future generations.