

Interdependencies between formal and informal networks in artisanal and small-scale gold mining in Peru: The case for explosives

L. Jaramillo-Urrego and N.M. Smith

Colorado School of Mines, USA

INTRODUCTION

Peru is the largest producer of gold in Latin America, and the eighth largest producer globally¹. Approximately 20% of this gold comes from artisanal and small-scale gold mining (ASGM)², a sector that largely operates informally. Between 2012 and 2021, gold exports from Peru were 465 metric tons more than the reported production, nearly a 35% gap^{3,4}. Although countries such as Switzerland and the United States have developed different standards to ensure gold traceability from their suppliers, implementing these is a challenge. In Peru and other ASGM regions, the boundaries between formal and informal mining activities are fluid, and people, mining supplies, and gold commonly move between the formal and informal sectors.

This study focuses on a single material, explosives, to highlight the intersections between informal and formal ASGM networks. Explosives are highly regulated by the Peruvian government; however, they are also bought and sold on the black market and are relatively easy for miners operating in the ASGM sector to purchase. We show that the intersections between informal and formal networks inhibit transparency in gold supply chains. Although our results are specific to the Peruvian context, they provide insights for considering transparency and responsible mineral supply chains globally.

METHODS

This study is based on quantitative and qualitative data collected using ethnographic field methods in Peru over a year (2020-2021). We conducted 89 semi-structured interviews both virtually, and in-person. Three months of fieldwork took place in 2021 in the departments of Puno, Arequipa, La Libertad, and Lima. For the most part, interviews were conducted in the workplace, initially targeting key informants and then expanding through snowball sampling.

The interviews included men (68) and women (67) with different roles including miners and mineral processing plant workers (111), NGO staff members (6), ASGM experts, such as lawyers and former government authorities (9), and current local and regional authorities (9). In total, 135 people participated in this study.

¹ U.S. Geological Survey. (2021). Mineral commodity summaries 2021: U.S. Geological Survey, 200 p., <https://doi.org/10.3133/mcs2021>.

² Valencia, L. (2015). *Las Rutas Del Oro Ilegal. Estudios De Caso En Cinco Países Amazónicos*. Sociedad Peruana de Derecho Ambiental. <https://spda.org.pe/wpfb-file/larutadeloro-completo-final-doblecara-pdf/>

³ Banco Central de Reserva del Perú. (2022). Total exportaciones. Lima, Peru. Available from <https://estadisticas.bcrp.gob.pe/estadisticas/series/anuales/resultados/CD11498DA/html>

⁴ Ministerio de Energía y Minas – MINEM. (2021a). Producción minera. Lima, Peru. Available from <http://www.minem.gob.pe/estadisticaSector.php?idSector=1&idCategoria=10>

RESULTS

In Peru, there are nine companies that are authorised to manufacture explosives for civil use⁵. To obtain explosives from these companies, a buyer must have a permit from the National Superintendence of Control of Security Services, Weapons, Ammunition, and Explosives for Civil Use (SUCAMEC). To obtain this permit, a buyer needs to demonstrate that they have a risk management plan and robust safety protocols, as well as an appropriate storage facility for the explosives. The buyer must also hold a mining title or exploitation contract to show where they are going to use the explosives.

Getting around these regulatory requirements is not an insurmountable challenge for ASGM operators. Although some of these companies have systems that track the explosives, the buyers, and the destination of the explosives, in many cases, once the explosives are sold, their traceability becomes less transparent. During our interviews, respondents shared that some of the buyers have the necessary documentation, but they do not conduct any mining activities themselves and instead, resell the explosives informally. Other buyers purchase more explosives than they need for their own mining operations and sell the extras to other miners who do not have the appropriate permits or middlemen who resell them for up to four times the original cost. Often, these transactions take place in remote areas late at night, or bribes are paid to law enforcement. Some interviewees claimed that in some cases, explosives were exported legally to the neighbouring country of Bolivia, and then re-imported illegally to Peru. Less strict border controls and explosives regulations in Bolivia enabled the sale of explosives back to Peruvian miners who did not fulfil the legal requirements of their own country.

The majority of ASGM operators in Peru do not have permits to purchase and handle explosives because of the costs involved, and the complicated bureaucratic procedures required to obtain the permits. This forces miners to turn to the black market. Miners often stated, "Without explosives, we cannot mine". Additionally, due to the need for and high cost of explosives, miners often use them unsafely to optimise their purchases. For example, some miners explained that they use less detonating cord when blasting, which causes significant safety risks. Furthermore, one interviewee admitted to manufacturing homemade explosives, a common practice in other ASGM regions including Colombia⁶. Some ASGM operators in Peru sell their gold to formal medium-scale mining companies under cooperative agreements. However, many miners stated that these companies do not support miners in legally purchasing and using key material inputs, including explosives.

Although the purchase of explosives from their origin is often done through legal channels, they can easily enter the informal market due to the relatively weak mechanisms to ensure traceability until their final destination. The high cost and complicated bureaucracy of obtaining explosive permits lead many actors to use informal pathways to transport and purchase them. Inconsistent border controls also allow formal sales of explosives to Bolivian buyers to return to Peru illegally, nullifying the efforts made by some companies to trace the supply.

CONCLUSIONS

Small-scale gold production often represents a significant volume of gold for formal companies, as evidenced in one region of Peru, where a formal medium-scale mining operation mine obtains up to almost half of its production from small-scale miners. Efforts should be made by the medium-scale mining companies, as well as the state to support small-scale miners in acquiring the relevant permits and properly training them to safely use and handle explosives. These actions will contribute to a more responsible supply chain of explosives and could allow better traceability and state management of them at the local level through the control exercised by medium-scale mining companies. Based on this research, explosives represent one critical mining input that is highly regulated but challenging to trace.

⁵ Ministerio de la Producción. (2020). Registro de empresas fabricantes de explosivos de uso civil. Peru. Available from <https://www.gob.pe/institucion/produce/informes-publicaciones/454357-registro-de-empresas-fabricantes-de-explosivos-de-uso-civil>

⁶ Holley, E. A., Smith, N. M., Jimenez, J. A. D., Cabezas, I. C., & Restrepo-Baena, O. J. (2020). Socio-technical context of the interactions between large-scale and small-scale mining in Marmato, Colombia. *Resources Policy*, 67, 101696.

The ease of funnelling explosives into informal markets significantly decreases the ability to create responsible gold supply chains.



Linda Mishell Jaramillo Urrego

Colorado School of Mines

Ph.D. student at Colorado School of Mines, studying Earth Resources Development Engineering. She holds a master's degree in Advanced Mineral Resources Development - AMRD, an international program between Montanuniversität Leoben (Austria) and Technische Universität Bergakademie Freiberg (Germany). Her BS is in Mining and Metallurgical Engineering from the Universidad Nacional de Colombia, where she worked three years as a researcher on different topics. Her current research focuses on gold supply chains in Peru. She is very passionate about the social aspects related to mining activities, especially at the artisanal and small-scale levels.

