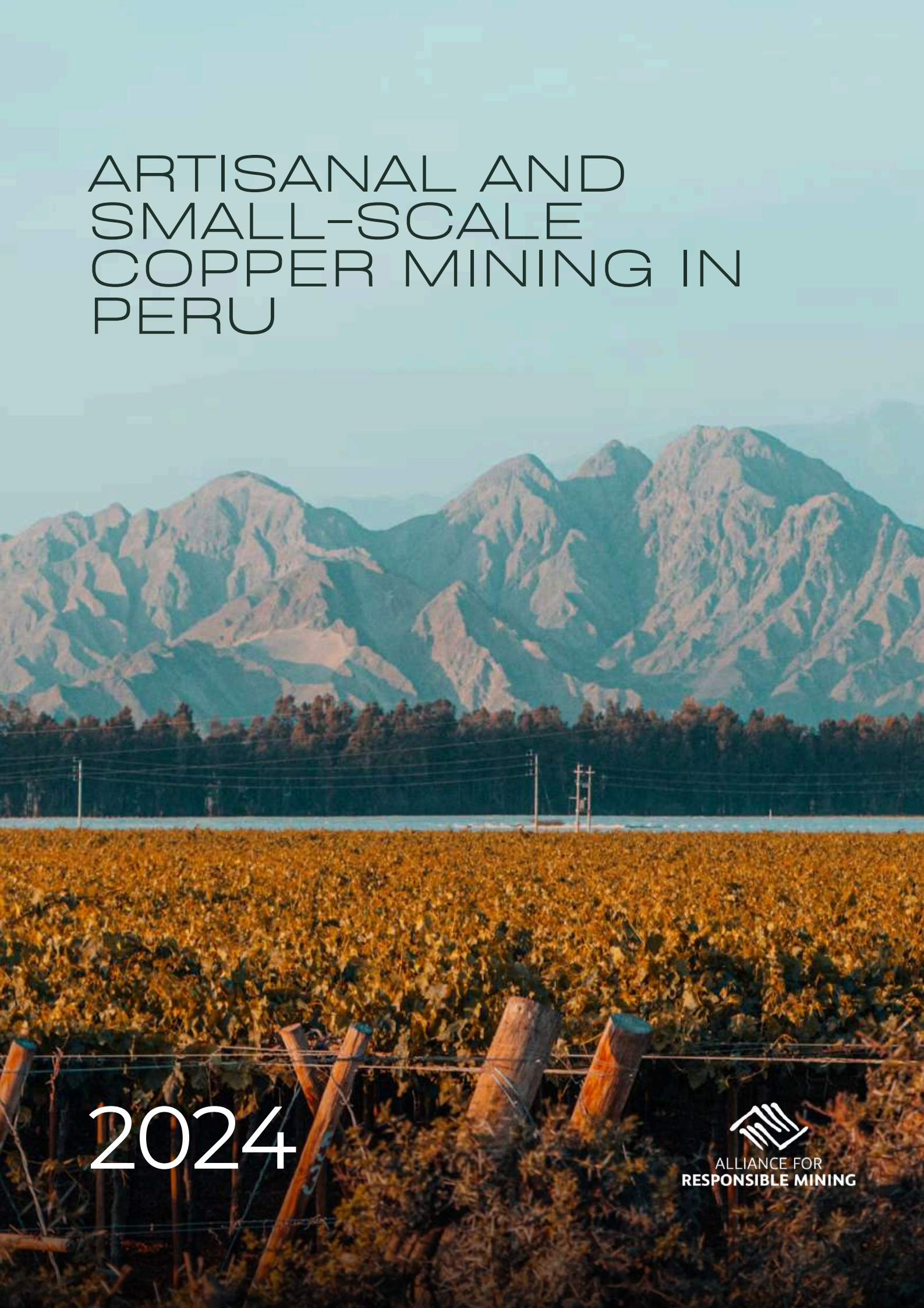
ARTISANAL AND SMALL-SCALE COPPER MINING IN PERU



2024

ALLIANCE FOR
RESPONSIBLE MINING

ARTISANAL AND SMALL-SCALE COPPER MINING IN PERU

FUNDED BY:
ISEAL INNOVATIONS FUND, WITH THE GENERAL SUPPORT OF THE PRINCIPAL DONOR SWISS STATE SECRETARIAT FOR ECONOMIC AFFAIRS - SECO

FUNDING AND DEVELOPMENT CONTRIBUTIONS:
PROYECTO MINSUS DE LA GIZ
THE COPPER MARK
INTEL CORPORATION

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The realization of the project was possible thanks to a grant from the ISEAL innovations fund which is supported by:

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Economic Affairs SECO

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MAY 2024, MEDELLIN, COLOMBIA.

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ABBREVIATIONS AND ACRONYMS

AMP	Artisanal Mining Producer
ASM	Artisanal & Small-Scale Mining
ASMC	Artisanal & Small-Scale Cooper Mining
ASMG	Artisanal & Small-Scale Gold Mining
BCRP	Banco Central de Reserva del Perú (Central Reserve Bank of Peru)
COFOPRI	Organismo de Formalización de la Propiedad Informal (Organization for Informal Property Formalization)
CTS	Cents
CDMS	Comisión para el Desarrollo Minero Sostenible (Sustainable Mining Development Commission)
CRAFT	Code for Risk Mitigation in Artisanal and Small-Scale Mining, Forming Transparent and Legal Chains
DPP	Defensoría del Pueblo del Perú (Ombudsman of Peru)
DREM	Dirección Regional de Energía y Minas (Regional Energy and Mines Department)
FMT	Fine Metric Tons
GEOCATMIN	Geological Database Management and Mining Cadastre System
IGAFOM	Instrumento de Gestión Ambiental y Fiscalización para la Formalización de Actividades de Pequeña Minería y Minería Artesanal (Environmental Management and Oversight Instrument for the Formalization of Artisanal and Small-Scale Mining Activities)
IIMP	Instituto de Ingenieros de Minas del Perú (Mining Engineers Institute of Peru)
INGEMMET	Instituto Geológico, Minero y Metalúrgico (Geological, Mining and Metallurgical Institute)
INEI	Instituto Nacional de Estadística e Informática (National Statistics and Informatics Institute)
LB	Pound
LD	Legislative Decree
LM	Large-Scale Mining
MINEM	Ministerio de Energía y Minas (Energy and Mines Ministry)
MINTRAC	Ministerio de Transporte y Comunicaciones (Transport and Communications Ministry)
MINCUL	Ministerio de Cultura (Ministry of Culture)
MT/D	Metric Tons/Day
NGO	Non-Governmental Organization
REINFO	Registro Integral de Formalización Minera (Comprehensive Mining Formalization Registry)
SD	Supreme Decree
SMP	Small-Scale Mining Producer
SUNAT	Superintendencia Nacional de Estadística e Informática (National Statistics and Informatics Superintendency)
UADA	Unidad de Administración Documentaria y Archivo (Document Administration and Archive Unit) – MINEM
USD	United States Dollar

EXECUTIVE SUMMARY

This report carried out between 2023 and 2024 provides a greater understanding of the reality of artisanal and small-scale copper mining (ASMC) in Peru. It is expected that it will provide useful insights to generate an open dialogue between all stakeholders of the copper value chain within the framework of sustainable development.

Small-scale mining is defined by the Peruvian legislation, as artisanal and small-scale mining (ASM). However for the purposes of this study, ASM includes informal (in the process of becoming formalized) and illegal (practiced in prohibited sites).

A mixed methodology was used for this research that allowed statistical information – geographical spatial data analysis – to be validated with qualitative information. This approach allowed us to draw conclusions about the social, economic and cultural dynamics of ASMC miners in Peru.

Four methodological instruments were implemented:

i) Quantitative analysis of official Comprehensive Mining Formalization Registry (REINFO) data, ASMC production reported by the Energy and Mines Ministry (MINEM), and the Document Administration and Archive Unit (UADA-MINEM) Directory of Processing Plants and Archives.

ii) Qualitative analysis of secondary information. There is few academic literature available on the topic. The literature was limited to a few theses from provincial universities in Peru – with greater emphasis on Apurímac –, blogs and regional newspaper articles.

iii) The creation of a spatial analysis database using ArcGIS for mining concessions and peasant communities.

iv) More than fifty interviews that included miners and other stakeholders in the copper value chain.

These tools provided a comparative information scheme in order to update and validate current data.

The geographical scope initially considered included i) Nasca (Ica) – Chala (Arequipa); ii) Apurímac; iii) Huancavelica; and iv) Moquegua. During the course of the research, Chala was not included, as it was found that the area specializes to a greater extent in gold processing rather than copper. Moquegua was also not included as the miners consulted did not have active operations due to the low profitability of the process.

The research results are organized into two sections. The first section analyzes socioeconomic data from the prioritized departments (Apurímac, Huancavelica and Ica). The second section goes deep into case studies.

The departments of Apurímac and Huancavelica has lower per capita income, a largest percentage of illiterate population, and a predominantly Quechua-speaking population who identify as indigenous. Its in this area where the largest financial investment in mining exploration and extraction projects are concentrated (Apurímac US$ 10.199 billion).

The formalization rates indicated by REINFO are quite low for the three departments. ASMC copper production is negligible, and small-scale mining accounted for 0.2% of domestic production in 2022. Artisanal mining was included in state data for 2008, 2009 and 2010 only because a single miner declared production. There are currently no official estimates.

The study concludes that there are approximately 100,000 ASMC miners in Peru, based on average ASM population estimates. Also, it was found that half (50,000) of the miners combine the extraction of gold and copper, and the other half (50,000) are dedicated exclusively to the extraction of copper.

The second section presents nine case studies: i) Ica processing plants; ii) SOLMIN; iii) Cobre Pampa Sector; iv) Marcona District Sector; v) Tapairihua District Sector; vi) Coyllurqui District Sector; vii) Huaquirca District Sector; viii) Huancabamba- Checche- Huaracopata Sector; and ix) Churcampa Province Sector.

It is notable that only the SOLMIN mining company authorized the researchers to use its name as registered in the National Statistics and Informatics Superintendency (SUNAT). The subjects of the other cases addressed here preferred anonymity, and the district and/or province in which they operate is used to characterize their experience.

This section in particular presents the complex situations that miners experience, in aspects such as production, commercialization and sociocultural relations, as well as in relation to the communities where they work and to the large-scale mining units that operate. A series of case study data is thus systematized, which allows us to identify the particular characteristics of each case and, taken together, to uncover shared problems, among which are a dependence on the processing plants, the invoicer and the transporters.

Interpretation of the results is divided into four sections:
i) the environmental impacts of ASMC.
ii) the ASMC supply chain.
iii) the social characterization of ASMC.
iv) the ASMC legal framework.

The information contained in each of these sections allows us to draw technical inferences; for example, that ASMC miners pollute less than gold miners, and that the supply chain has particular unfavorable characteristics that negatively impact the profitability of the operation.

Other conclusions are more social in nature, such as the fact that the majority of the ASMC population is of Quechua origin, and that the communities in which they operate tend to undergo a series of organizational transformations.

Finally, the report sets out a series of governance challenges, including the homogeneous treatment of ASM by law that might increase vulnerability of ASMC communities.

The main conclusions of the study are organized into
i) Social components, related to human, labor and territorial rights
ii) Environmental components, by initially identifying some of the impacts of ASMC on the environment.
iii) legal components, in relation with the differentiated treatment by the State and its executive bodies.

At the end of this report, a series of recommendations are provided that could be used to develop intervention plans, public policies and programs aimed at improving production, commercialization and the coexistence of ASMC miners in the Peruvian territory.

INTRODUCTION

The aim of this report is to increase knowledge about the reality of artisanal and small-scale copper mining (ASMC) in Peru, in order to generate an open dialogue on its dynamics and potential to contribute to sustainable development between all stakeholders of the copper value chain. This research report presents the particular stories of ASMC miners; therefore, its scope is not all-encompassing. Rather, it seeks to take a first step in the difficult task of understanding this issue.

In Peru, the artisanal and small-scale mining (ASM) of gold has had problems since its inception, due to the extensive informality and illegality that accompanies it. Therefore, government's formalization efforts have mostly been directed towards gold extraction processes. ASMC appeared in the last decade, following a sustained increase in copper prices and greater knowledge among miners of its commercial potential. Therefore, this research aims to shed light on the problem of ASMC in order to contribute to its understanding and consolidation.

Peru is the second largest copper producer in the world. The country exported 2.45 million fine metric tons (FMT) of copper in 2022, with a value of US$ 19.598 billion (MINEM, 2023).

The department of Ancash contains 19.3% of domestic production, and 59.1% of Peru's copper comes from the southern departments (Arequipa, Apurímac, Cusco, Tacna and Moquegua) located both in the Andes and on the coast (MINEM, 2023). Officially, small-scale mining produced only 0.2% of Peru's copper in 2022, and there is no information on artisanal production for that year (MINEM, 2023).

MINEM (2012) provides statistical information on copper production by artisanal miners for 2008, 2009 and 2010. According to these data, artisanal copper mining showed an increasing trend; however, in subsequent years no figures for this type of mining were published.

In Peru, artisanal and small scale mining (ASM) has faced great challenges due to the complexities of formalisation and legalisation.

A publication by the Mining Engineers Institute of Peru (IIMP, 2022) suggests that, in recent years, this trend has continued among informal miners, attracted by the increase in the price of copper. This informal growth has generated a conflict between mining strata (small-, medium- and large-scale mining) over access to this resource.

In 2022 the Social Conflict Report (No. 220 of June 2022), the Ombudsman of Peru (DPP) included two events in which informal copper miners clashed with Large Scale Mining (LSM) companies. According to the institution, both incidents require greater attention and monitoring, since they could escalate into more intense conflict (DPP, 2022). The Sustainable Mining Development Commission (CDMS, 2020) points out that this situation is worsened by the lack of government information on the current state of illegal and informal ASM, which affects the effectiveness of public policies that encourage the formalization of miners. It is therefore important to work on a clear definition of what ASM is and what we mean by the ASM of copper.

Historically, the concept of artisanal and small-scale mining (ASM) has given rise to a broad debate on what exactly is it giving its multiple manifestations. Existing definitions are limited and address only some facets of the sector. The lack of an accurate definition makes it difficult to establish a more holistic and appropriate approach.

A weak definition of ASMC fails to disclose the social role that it plays as a source of income among many low-income sectors. These approaches to defining ASM take into account formal and circumstantial conditions that do not shed light in all its complexities.

The Peruvian government states that currently Small Scale Mining covers an area of up to 2,000 hectares (4,942 acres) and has a productive capacity of up to 350 metric tons per day (MT/D).

Similarly Artisanal Mining covers an area of up to 1,000 hectares (2,471 acres) and has a productive capacity of 25 MT/D. Finally, informal mining is the one that is in the process of formalization and registered in the REINFO, while illegal mining is carried out in areas prohibited by the Peruvian government.

For the purposes of this study, we consider ASM as defined by the Peruvian government as artisanal and small-scale mining. However, this form of ASM has characteristics of informality and illegality.

ASM in Peru is specified as either metallic or non-metallic, without further details being given. In the particular case of copper, there are no direct specifications for its differentiation and treatment. Aiming to make this differentiation clear in this report, the letter “C” is added to specify that if refers to copper ASM: ASMC (Artisanal Small-Scale Copper Mining).

Information about ASMC in Peru is scarce. Extensive fieldwork was therefore carried out as part of this research in order to make contact with mining units, rural communities and regional specialists who have been analyzing the issue.

The scope of the research prioritizes three high-impact ASMC departments: Ica, Apurímac and Huancavelica.

Nine case studies were considered in these three departments, including mines, district sectors and peasant communities whose mining operations covered different contexts and legal statuses.

The report is organized into the following sections:
i) Methodology
ii) Case studies
iii) Main results considering the production process, environmental impacts of ASMC, analysis of the supply chain, social characterization and analysis of the legal framework.
iv) Conclusions and further recommendations.

I. METHODOLOGY

This study adopted a mixed methods research approach based on a combination of qualitative and quantitative techniques. Fieldwork was prioritized, as the existing data on ASMC is scarce.

The following instruments were designed:

i) Quantitative design to analyse official Peruvian sources.
ii) Qualitative analysis of secondary data sources
iii) Geospatial analysis of mining concessions using ArcGIS.
iv) Fieldwork in mining operations
v) Overview of fieldwork results
vi) Design of spaces for collective dialogue.

These instruments allowed for the validation of primary and secondary information in order to corroborate the research results and interpret findings.

1.

QUANTITATIVE DESIGN TO ANALYSE OFFICIAL PERUVIAN SOURCES

Four official sources of information from the Peruvian government were identified:

i) Data on copper production from the 1990s to 2023 in MINEM Mining Yearbooks.
ii) REINFO data to determine the number of formal miners in prioritized departments.
iii) Directory of Processing Plants by region.
iv) UADA-MINEM archives.

-ASMC official production data. MINEM is the state body responsible for promoting and regulating mining activity in Peru.

It collects production data reported by mining owners in order to consolidate and publish the information. We consider ASMC government data incomplete, because in the last 2022 Mining Yearbook (MINEM, 2023), for example, the production of artisanal copper miners was not recorded, and there was no estimate of informal production. This makes studies like the present one extremely important to understand the problems of this mining subsector. According to MINEM, small-scale miners produced 5,428 fine metric tons (FMT) of copper in 2022, a figure that is very low when compared to the production observed in our fieldwork. MINEM figures have, therefore, served as a comparative measure in order to establish approximate ASMC production.

-REINFO is administered by the General Mining Formalization Department (DGFM). This tool aims to identify the number of miners by department and district. This facilitates the analysis of cases and allows to establish comparisons regarding the formalization process. Furthermore, it helps to establish the progress of formalization processes.

For the purposes of this study, REINFO does not allow to differentiate the miners dedicated to copper. This is a great limitation, as it hiddens how many miners are in the formalization process, how many have achieved formalization and how many have been rejected. Due to this lack of data, it can be infer that the formalization process is being carried out indiscriminately, without taking into account sociocultural and technical variables for extraction and commercialization processes.

-**The Directory of Processing Plants** is a tool managed by MINEM that states how many plants operate in the department or district of interest, and with what daily capacity they operate. It also provides information about the location of the companies that own these plants. Among its limitations, the directory does not establish the type of mineral that is processed and, consequently, the product that is achieved. This absence of information limits access to specific data on how many of these plants process copper, and how many process other types of minerals.

-The UADA-MINEM archive is available on the Geological, Mining and Metallurgical Institute's (INGEMMET) GEOCATMIN portal. This archive contains all the historical files on mining concessions, and REINFO information can be tracked and cross-referenced to identify the miners who are seeking extraction contracts. The archive has only been updated to December 2022, which limits the analysis of the data presented in this report■

2.

QUALITATIVE ANALYSIS OF SECONDARY DATA SOURCES

For this research, a comparative and reflexive secondary data analysis model was chosen. During data analysis, information from different sources was cross-referenced to characterize the different stakeholders, places and contexts that appear in ASMC activities.

Literature on ASMC is limited, which has resulted in a reduced bibliography for this study. Secondary sources include the work of researchers connected to private institutions, research papers for academic degrees, and physical and electronic newsletters available at the time of research. However, crucial information was obtain from the scarce sources available that allowed to understand and explain the socioeconomic conditions of ASMC miners. The results presented thus emerged from dialogue and reflection between our data and that of other researchers. One aspect to highlight is that the largest academic bibliography came from the Universidad Nacional de San Antonio Abad del Cusco, and focused on Apurímac. The bibliography from centers of study in other regions was comparatively limited, and it was necessary to rely more on fieldwork and information from the Peruvian central government. No research on ASMC was found from universities and institutions in Lima.

3.

GEOSPATIAL ANALYSIS OF MINING CONCESSIONS USING ARCGIS

A database was developed that contained information on mining concessions identified in GEOCATMIN, Transport and Communications Ministry (MINTRAC) access roads, National Statistics and Informatics Institute (INEI) 2017 Populated Centers, Organization for Informal Property Formalization (COFOPRI) Peasant Communities, and the base cartography of the political division of Peru's National Open Data Platform. Information from the case studies was selected in the ArcGIS PRO 10.8 software using the database designed. GIS analysis of spatial data was then carried out in ArcGIS.

Literature on ASMC is limited, which has resulted in a reduced bibliography for this study. Secondary sources include the work of researchers connected to private institutions, research papers for academic degrees, and physical and electronic newsletters available at the time of research. However, from the limited that was available, information was obtained that allowed us to understand and explain the socioeconomic realities of ASMC miners. The results presented thus emerged from dialogue and reflection between our data and that of other researchers. One aspect to highlight is that the largest academic bibliography came from the Universidad Nacional de San Antonio Abad del Cusco, and focused on Apurímac.

Limitations arose from the data on peasant communities, as different sources were used and not all of them had the same information content. We therefore decided to use the COFOPRI source for peasant communities. COFOPRI is the governing body for the property formalization program, and sustains it at the national level.

The data on mining extraction and processing concessions are in the same GEOCATMIN database, which makes it difficult to quickly identify the nature of mining operations ■

4.

FIELDWORK IN MINING OPERATIONS

A qualitative approach was designed based on semi-structured interviews. The sampleused for this study included miners, representatives of copper processing plants, representatives of Peruvian government institutions, journalists and other specialists on the subject (consultants and members of local non-governmental organizations (NGO). The topics addressed were mining production processes, environmental impacts, the legality of mining operations, the supply chain and recommendations for action proposed by miners.

Prior to the semi-structured interviews, the researchers carried out a participant observation process with key subjects in Ica, Apurímac and Huancavelica. In Ica and Huancavelica, it was fundamental to have local informants. Special thanks are given to Roger Bazan for the research in ICA and Heberaldo Huacharaqui in Apurímac. They facilitated the introduction of the researchers into mining domains, through their knowledge of local language and culture. Participant observation allowed an empirical understanding of the processes observed in mines and peasant communities.

The Fieldwork required that the main researchers understood the social and technological conditions to be identified in the copper value chain. A prior set of visits made it easier to carry out semi-structured interviews, due to the informality in which ASMC miners operate.

Although there was a process of immersion and rapprochement with mining stakeholders, informality and mistrust were an important challenge to overcome. In Apurímac, where there are large-scale mining exploration and extraction projects, rapprochement with local stakeholders, in particular peasant communities, is greatly restricted.

However, fifty semi-structured interviews were carried out as part of this research process. It was common that miners did not want to specify the names of their mining operations. Therefore, this report uses the name of their community or sector of a district or population center. Some interviews were not recorded and others were discontinuous conversations, as they were carried out at different times. Despite the limitations, it was possible to interview twenty-six miners, two public accountants, two members of processing plants, three collectors, one transporter, four Peruvian government representatives, ten ASM and peasant community specialists, and two journalists. See Table #1.

Table N° 1: List of people interviewed

DATE	ORGANIZATION	DEPARTMENT
08 /11/ 2023	Concentrator plant	ICA
08 /11/ 2023	Processing plant	ICA
08 /11/ 2023	Nasca Miner	ICA
08 /11/ 2023	Nasca Miner	ICA
09 /11/ 2023	Nasca Miner	ICA
09 /11/ 2023	Nasca Miner	ICA
09 /11/ 2023	Nasca Miner	ICA
10 /11/ 2023	Nasca Miner	ICA
10 /11/ 2023	Cobre pampa miner	ICA-Arequipa
10 /11/ 2023	Nasca public accountant	ICA
11 /11/ 2023	Chalhuanca miner	Apurimac
11 /11/ 2023	Chalhuanca miner	Apurimac
11 /11/ 2023	Chalhuanca miner	Apurimac
12 /11/ 2023	Chalhuanca miner	Apurimac
12 /11/ 2023	Chalhuanca miner	Apurimac

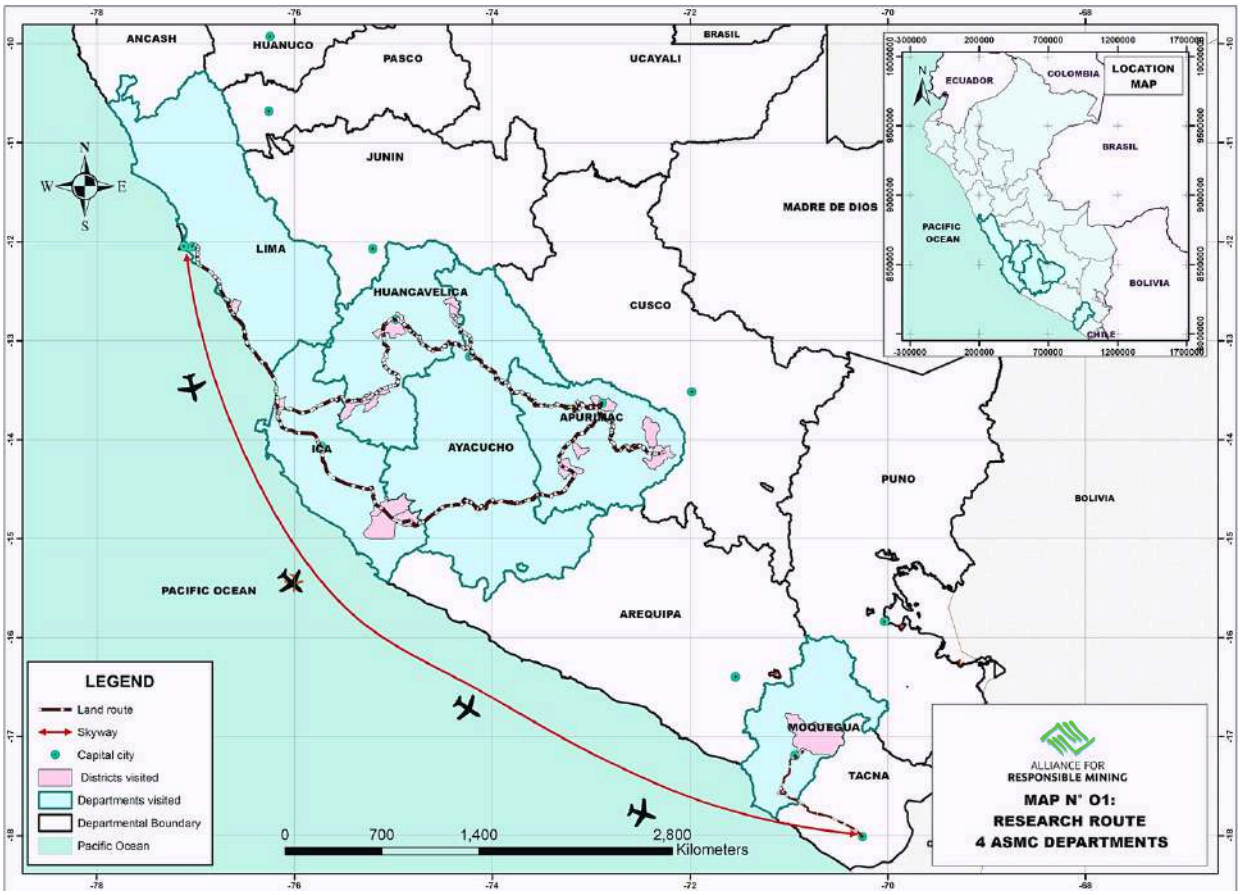
DATE	ORGANIZATION	DEPARTMENT
13 /11/ 2023	Chalhuahuacho miner	Apurimac
13 /11/ 2023	Andahuaylas miner	Apurimac
13 /11/ 2023	Huaquirca miner	Apurimac
13 /11/ 2023	Apurímac ASMC accountant	Apurimac
13 /11/ 2023	Copper collector	Apurimac
14 /11/ 2023	Copper collector	Apurimac
14 /11/ 2023	Huancavelica miners' Association	Huancavelica
16 /11/ 2023	Churcampa miner	Huancavelica
16 /11/ 2023	Churcampa miner	Huancavelica
17 /11/ 2023	Nasca public accountant	Huancavelica
17 /11/ 2023	Churcampa miner	Huancavelica
18 /11/ 2023	DREM Huancavelica	Huancavelica
18 /11/ 2023	Huancavelica copper collector	Huancavelica
18 /11/ 2023	Huancavelica copper transporter	Huancavelica
18 /11/ 2023	Huaytará miner	Huancavelica
20 /11/ 2023	Torata – Moquegua miner	Moquegua
20 /11/ 2023	Torata – Moquegua miner	Moquegua
21 /11/ 2023	Torata – Moquegua miner	Moquegua
21 /11/ 2023	Torata – Moquegua miner	Moquegua
22 /11/ 2023	DREM Moquegua	Moquegua
23 /11/ 2023	AMASUC	Moquegua
25 /11/ 2023	ASM and indigenous peoples specialist	Cusco
29 /11/ 2023	Extractive activities specialist	Apurimac
30 /11/ 2023	Peru ASM specialist	Lima
17 /12/ 2023	Peasant community specialist	Apurimac
06 /12/ 2023	Peasant community specialist	Cusco
05 /12/ 2023	Extractive industries specialist	Cusco
02 /12/ 2023	Peasant community specialist	Apurimac
01 /12/ 2023	Peasant community specialist	Apurimac
10 /12/ 2023	ASM illegality specialist - Peru	Lima
18 /12/ 2023	Journalist on ASM issues	Lima
16 /12/ 2023	Journalist on environmental issues	Lima
20/ 12/ 2023	ASM specialist - Peru	Lima
13/02/2024	consultant on governance issues	Lima
13/02/2024	consultants on governance issues	Lima

5.

OVERVIEW OF FIELDWORK

To begin this research, it was decided to take the following mining areas as a reference: i) Nasca – Chala, copper processing area; ii) Apurímac – Huancavelica, specific copper mining extraction areas; iii) Moquegua, due to the presence of large-scale copper extraction projects.

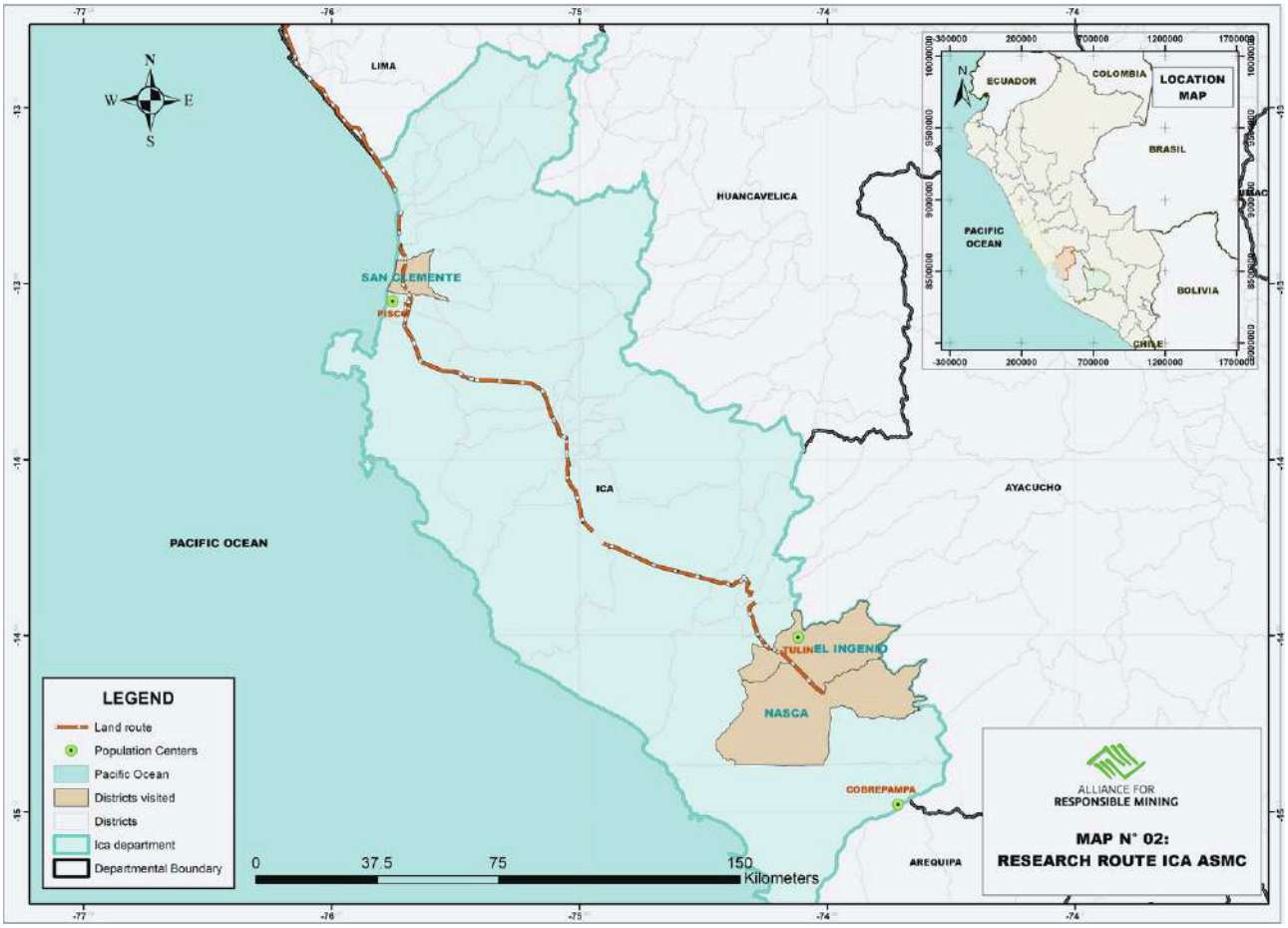
The fieldwork lasted from November 8 to December 7, 2023. Travel to the fieldwork areas from Lima was both by land and air, as can be seen on Map N° 1: research route through four ASMC departments.



Map n. 1

During the fieldwork, observations were made on the technical process of copper mining. It was observed that ASMC miners more frequently process copper using flotation systems in the plants located in Nasca, with copper concentrate as a product. Chala (Arequipa) plants specialize in gold leaching, so we ruled out making any visits to processing facilities there. Ica is no longer considered only a gold processing area due to the presence of plants.

It was possible to identify different mining operations in the process of formalization. From this visit, the districts of Pisco and Paracas (Pisco Province) were added to the analysis for miners from Huancavelica, who thus avoid making the journey to Nasca, as further copper concentrate processing centers that use the flotation process. See Map N.2.

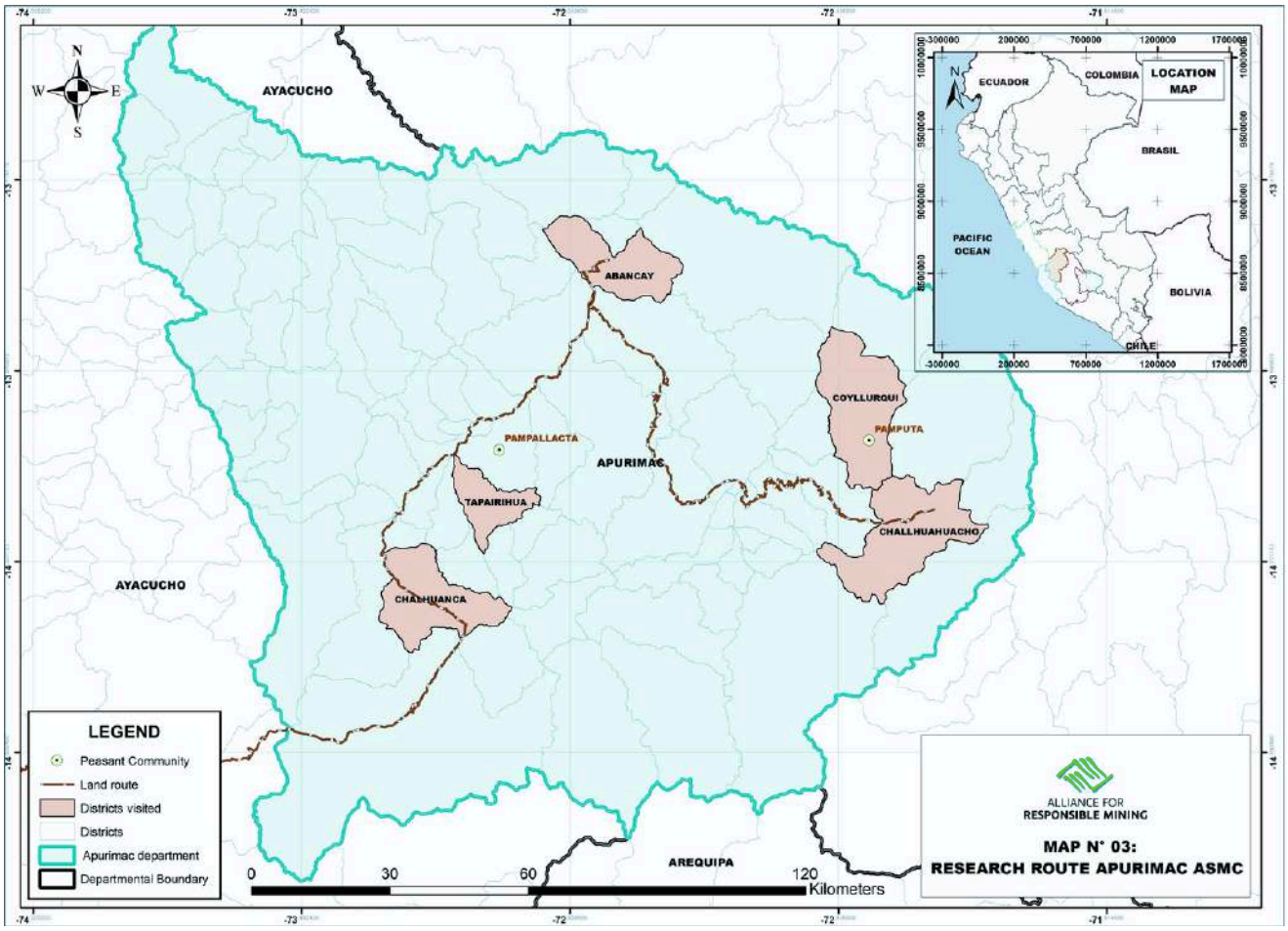


Map n. 2

In Ica, there was a lot of openness from miners and representatives of processing plants to establish dialogue on the topic under investigation. We visited sites at operating levels of 70 to 80 meters deep, with little safety and personal protection equipment.

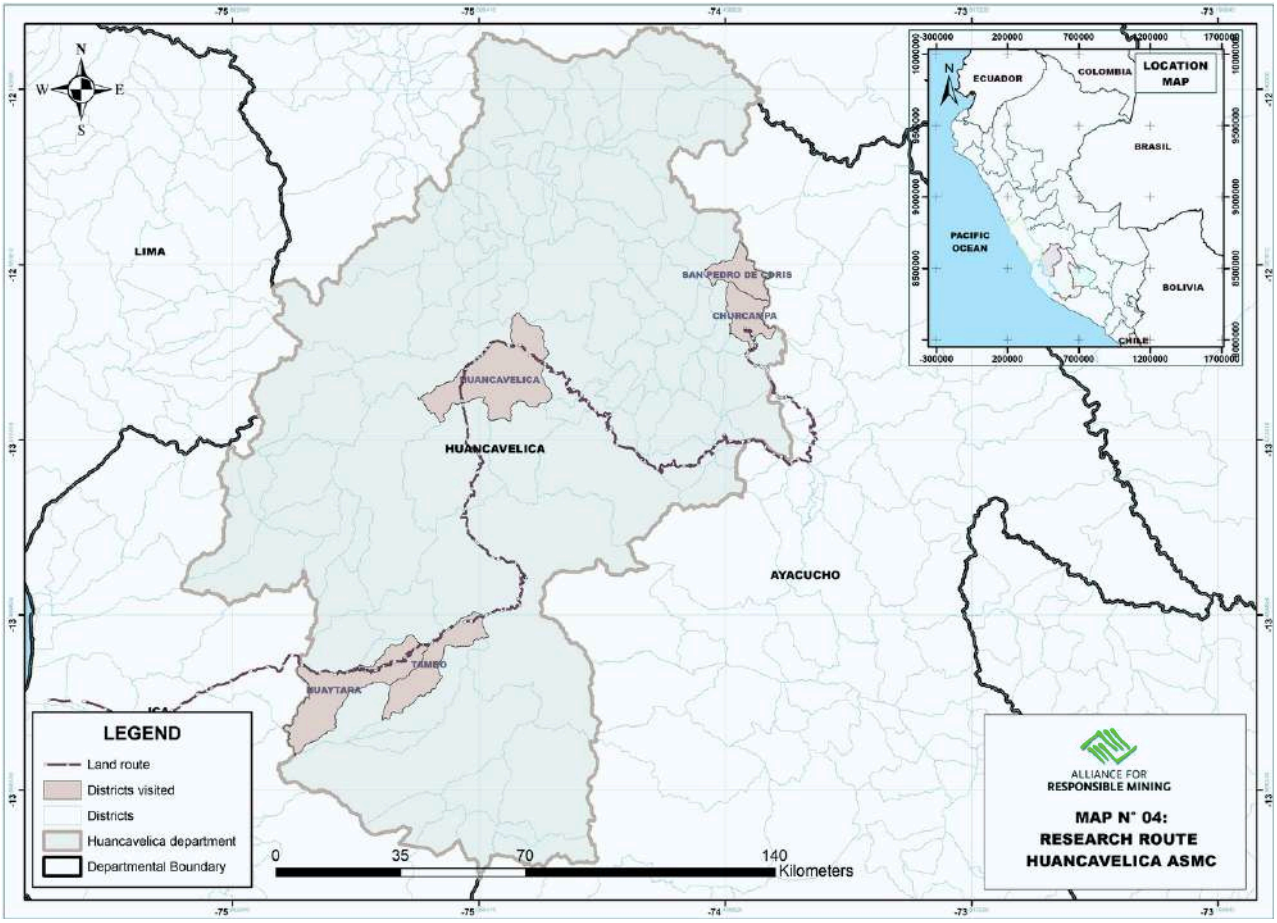
During the visit to Nasca, we made a trip by land to Puquio (Ayacucho) and then Chalhuanca (Apurímac). In Apurímac, it was more difficult to approach the topic in relation to the peasant communities involved in copper extraction.

This is because a lot of ASMC activity occurs on land that has been concessioned to companies that operate or seek to develop, large-scale formal copper mining projects. We visited some mining areas, but we mainly held conversations – in the form of interviews – with mining leaders who chose not to show us their mining operations, due to issues of trust. Mining activity in Apurímac is extremely complex, because of the coexistence of large-scale mining and ASMC. Additional information can be found on Map N° 3.



Map n. 3

We visited Chalhuanca, Chalhuahuacho, and Abancay by road on route to Ayacucho, and Andahuaylas before finally reaching Churcampa. There, we stopped to interview copper miners and other local stakeholders.
See Map N° 4.

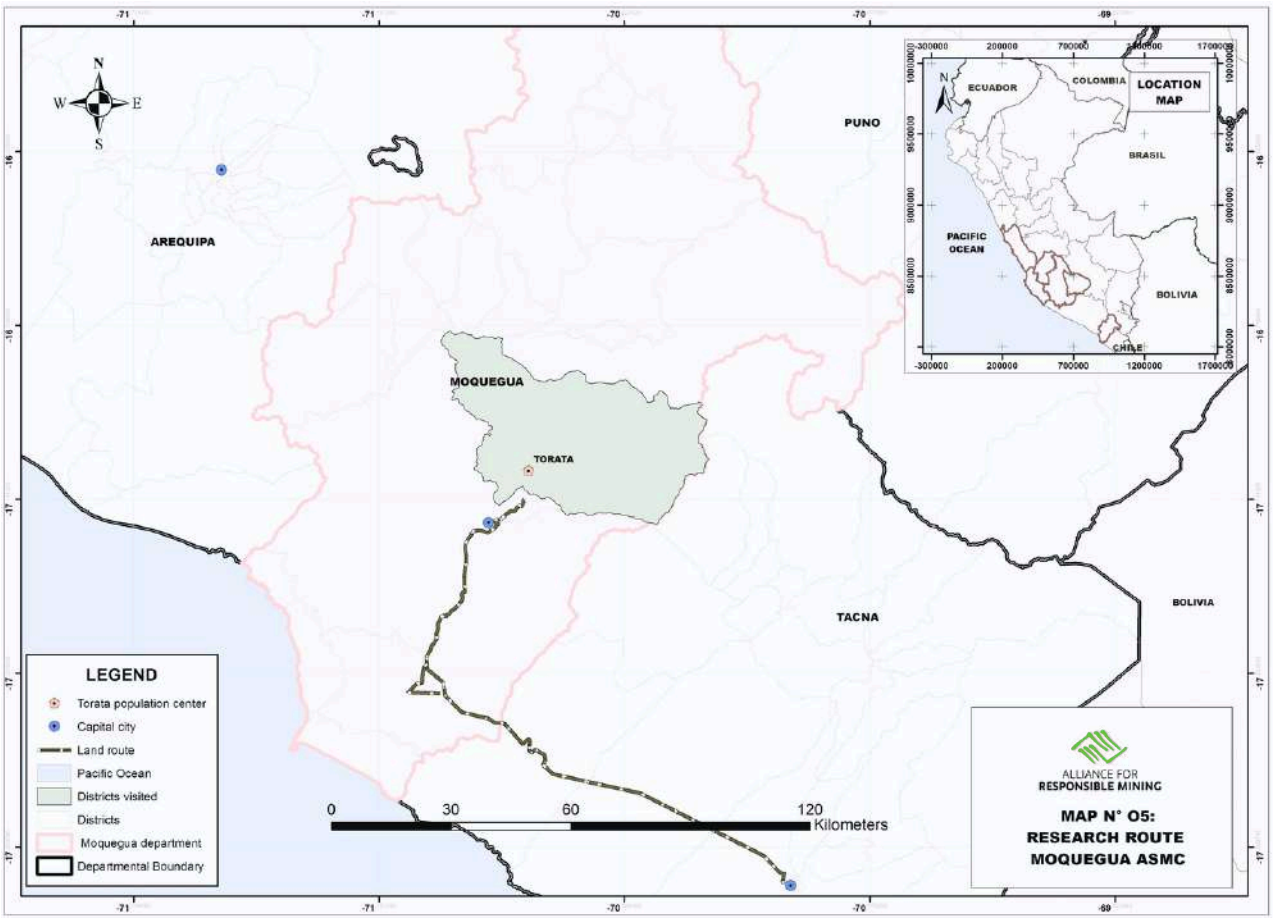


Map n. 4

Huancavelica miners stated that one of the biggest problems they face is the distance from their centers of operation to the processing plants in Pisco and Paracas.

It is important to mention that we ruled out including the Moquegua area in the study after carrying out the field visit. Initially, there was limited information about whether ASM activities involved copper, gold or a combination of the two.

We made visits to some operations, where we observed that the miners were working sulfide deposits that were not profitable due to their low-grade capacity of less than 0.5% Cu. In a later section, we will explain the ore head grades that allow this activity to be profitable. See Map N° 5.



Map n. 5

Based on this initial verifiable information, the analysis was restricted to three regions: Ica, Apurimac, and Huancavelica.

ICA

APURIMAC

HUANCAVELICA

6.

DESIGN OF SPACES FOR COLLECTIVE DIALOGUE

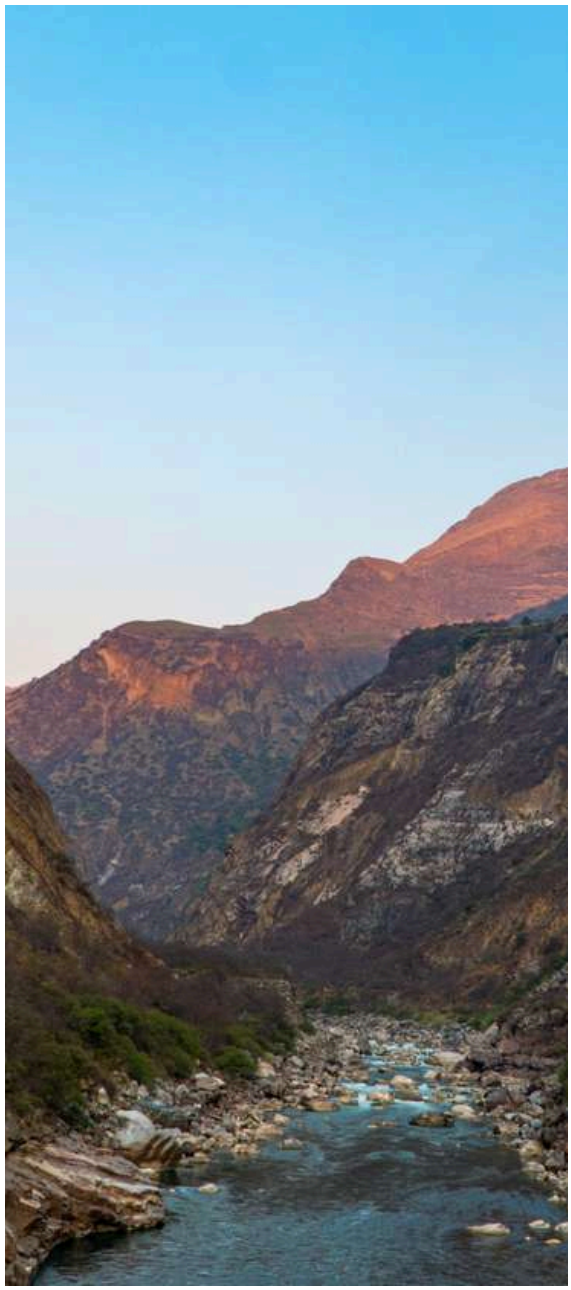
We held four collective dialogue workshops:
One with miners from Ica; one with miners from Apurímac; one with miners from Huancavelica; and one with miners from the three departments. These spaces allowed each group to develop a roadmap of recommendations to improve ASMC in Peru. The main topics addressed were grouped into: working conditions (legal regulations, workplace safety and environmental management); risks and opportunities; ASMC training needs; and relations between ASMC and large- and medium-scale copper mining. These collective spaces allowed us to design the recommendations presented in this report.

II. RESEARCH RESULTS

1.

PRIORITIZED DEPARTMENTS

Peru has extensive copper deposits. The main deposits are found in the southern Peruvian departments of Apurímac, Cusco, Ica, Huancavelica and Moquegua. In northern Peru, they are found in Ancash and Cajamarca. This research prioritizes the extensive presence of ASMC in Apurímac, Huancavelica and Ica. According to the Banco Central de Reserva del Perú (BCRP, 2022), in Ica, agriculture, fishing (artisanal and industrial) and mining are the main economic activities. Export and agribusiness crops are also prominent, in particular asparagus and grapes. Fishing activity is carried out both in an artisanal and industrial manner. In Apurímac (2023) and Huancavelica (2022), agricultural activity is mostly carried out using traditional technology, while mining is the most important economic sector.



ICA RIVER, PERÚ

1.1
SOCIOECONOMIC ANALYSIS

The analysis began with a review of demographic figures. According to the results of the last national census (INEI, 2018), of the three prioritized departments, Ica had the largest population with almost 850,000 people, followed by Apurímac with 405,759 and, lastly. Huancavelica with 347,639. Furthermore, the female population is higher than the male population by at least 2% in the three departments.

With regard to educational levels, a high degree of illiteracy is observed among the population. Huancavelica is one of the country's most affected regions, with almost 19% of its population in this category, followed by Apurímac with 12%, and Ica with 8%. The national illiteracy average in rural areas, mainly among women, is 22.8%. To a large extent, Apurímac and Huancavelica are home to a Quechua-speaking population. This is not the case in Ica, where the Quechua-speaking population is only around 6%. With regard to identity, 94% of the populations of Huancavelica and Apurímac identify as indigenous, while in Ica the indigenous population is almost 9%.

According to INFOMIDIS (2023), the two departments with the lowest per capita income in Peru are Huancavelica and ApurImac.

Table N° 2 shows that departmental socioeconomic data place Apurímac and Huancavelica at a lower level than Ica in terms of poverty, illiteracy and population density. This conditions the inhabitants of Huancavelica and Apurímac to search for alternatives in order to face the precariousness of poverty. Low-income levels mean that ASMC is seen as an alternative that offers more immediate income generation than agriculture and other low-investment agricultural activities.

ASMC is seen as an alternative that offers more immediate income generation than agriculture and other low-investment agricultural activities.

It has been confirmed that many of the miners who work in Ica and other areas of the southern coast come from Andean departments such as Apurímac and Huancavelica. These migratory processes can be explained by precarious socioeconomic opportunities. During the observation stage, we found that the primary objective for members of these groups is to earn money. The second objective is to learn the trade in order to replicate it in their areas of origin, or close to them. In the context of ASMC, high levels of poverty combined with low levels of education drive the population to move to other departments and consider mining activity as a source of income as important to or more important than agriculture.

Table N° 2: Socioeconomic data from prioritized departments and districts. Data to December 2023

DISTRICT	POPULATION		EDUCATION					LANGUAGE	
	MALE	FEMALE	NO FORMAL EDUCATION	ILLITERATE	PRIMARY	SECONDARY	HIGHER	QUECHUA	SPANISH
Ica	431,011	419,754	11,881	67,795	82,196	279,866	244,788	51,777	747,864
Nasca	13,906	13,726	1,007	2,275	5,306	10,199	5,211	2,422	23,778
Pisco	34,719	32,748	2,012	5,163	13,444	24,271	12,816	2,247	61,010
Ingenio	1,506	1,628	196	360	840	1,306	273	417	2,533
Marcona	7,289	8,692	388	1,075	2,746	5,831	3,689	1,765	13,317
Apurimac	204 958	200 801	43,929	48,373	65,709	10,443	72,534	268,294	113,687
Tapairihua	902	946	475	532	564	559	74	1,577	181
Coyllurqui	3,337	3,209	1,106	1,563	2,343	2,042	250	5,638	536
Huaquirca	749	1,092	181	245	535	654	246	1,336	349
Jose Arguedas	2,087	1 994	704	932	1,342	1,307	96	3,687	126
Huancavelica	178,797	168,842	48,950	65,744	111,947	105,031	28,195	211,904	115,578
Pedro Coris	1,613	1,832	445	627	935	1,185	362	1,770	1,451

Source: INEI (2018) and INFOMIDIS (2023)
* people who never attended any educational center
** only those who have completed a technical or university degree are considered
*** Quechua and Aymara are considered
****population with socioeconomic classification

Table N° 2: Socioeconomic data from prioritized departments and districts. Data to December 2023

DISTRICT	IDENTITY			RELIGION			POVERTY RATE****		
	INDIGENOUS ***	MESTIZO	WHITE	CATHOLIC	EVANGELICAL	NON-BELIEVER	NOT POOR	POOR	EXTREME POBERTY
Ica	97,350	469,720	38,119	539,790	67,956	24,859	99,347	196,240	59,389
Nasca	4,280	14,946	1,420	18,684	1,559	1,150	4,373	8,442	2,469
Pisco	5,220	36,935	3,400	42,711	2,157	1,058	5,670	10,940	3,952
Ingenio	755	1,277	80	2,089	232	87	693	911	1,722
Marcona	354	7,639	727	9,622	1,516	748	918	3,420	285
Apurimac	266,015	31,167	3,034	245,586	55,641	6,259	45,511	148,235	180,422
Tapairihua	1, 418	21	5	1,183	264	9	128	782	1,153
Coyllurqui	4,807	48	18	4,225	616	13	591	2,670	4,666
Huaquirca	1,343	117	9	1 382	98	23	1,059	3,918	5,674
Jose Arguedas	2,878	9	4	2,649	270	7	302	1,998	2,197
Huancavelica	215,744	38,860	5,222	194,220	67,350	3,708	45,186	131,810	182,414
Pedro Coris	2006	508	33	1,825	906	36	170	787	2,025

Source: INEI [2018] and INFOMIDIS [2023]
* people who never attended any educational center
** only those who have completed a technical or university degree are considered
*** Quechua and Aymara are considered
****population with socioeconomic classification

1.2

EXPLORATION AND EXTRACTION PROJECTS IN PRIORITIZED DEPARTMENTS

The 2022 Mining Yearbook (MINEM, 2023) offers aggregate data that allows us to establish the importance of copper in regions throughout Peru. Copper production has been recorded in the prioritized departments for more than 10 years, with Apurímac occupying third place, Ica ninth and Huancavelica twelfth at the national level. With regard to the future investment portfolio of mining projects in the prioritized departments, Apurímac has a joint investment potential of US$ 10.199 billion, ahead of Huancavelica with US$ 655 million and Ica with US$ 140 million.

According to the DPP (2023) in its Social Conflict Report N° 238 from December 2023, Apurímac has the highest presence of conflicts. Fifteen active and two latent conflicts have been registered in the department, making a total of 17. Of the 15 active conflicts indicated, nine relate to the Las Bambas mining company, and are classified as socioenvironmental. The rest are classified as communal and refer to boundary conflicts between communities. Of these communal conflicts, one refers to illegal mining in the Surfumarca sector, where the Chaccaro and Occaccahua communities are in dispute over territorial boundaries and the development of mining activities.

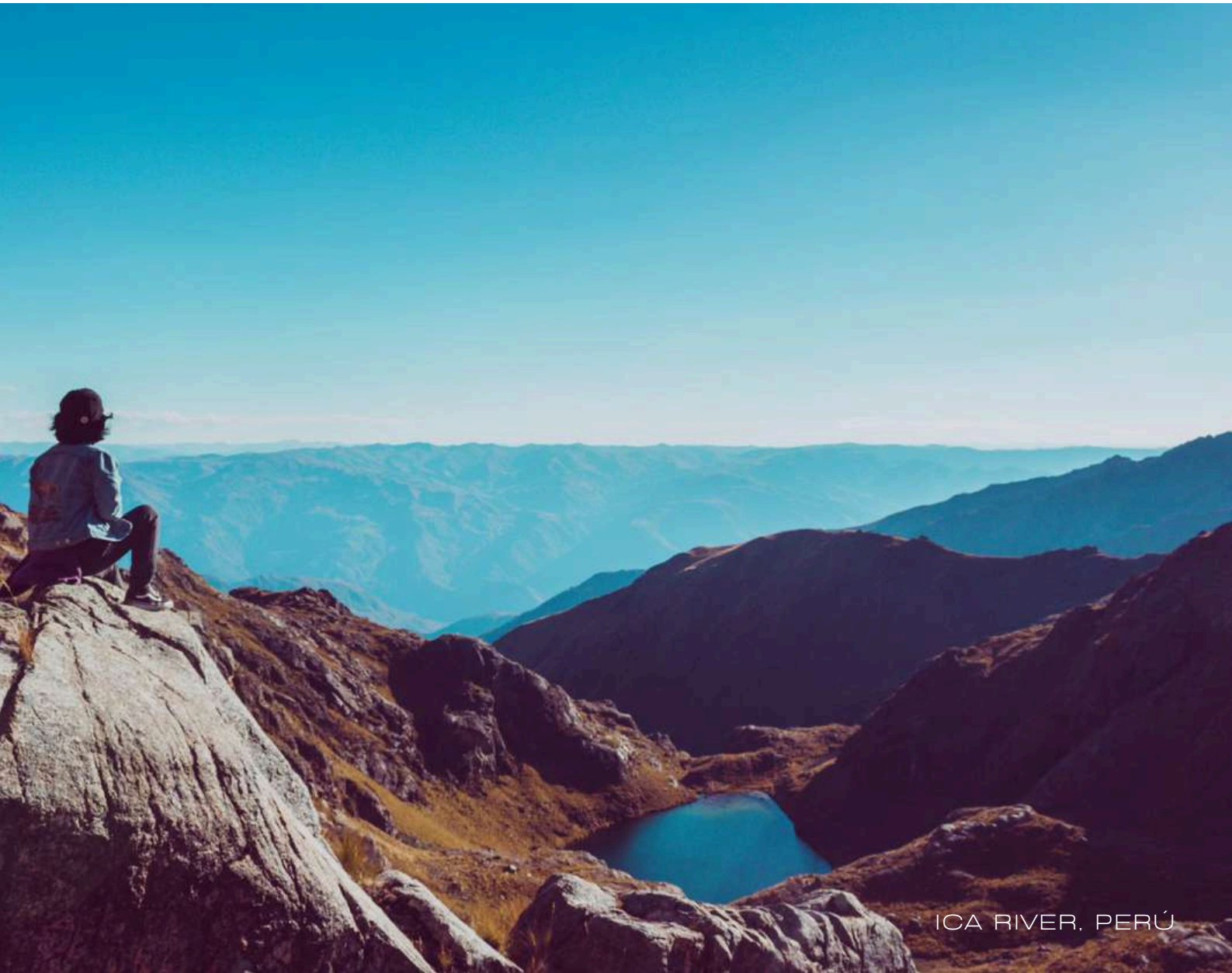
The two latent conflicts relate to large-scale mining, and one of them is located in the study area.

Huancavelica has the second highest presence of conflicts, with eight active and four latent conflicts. Of the active conflicts, five are socio-environmental, involving peasant communities and mining consortia. One of these is a matter for regional government, one is communal and one has been classified under 'other matters' and referred to the Universidad Nacional de Huancavelica. Concerning latent conflicts, two are socioenvironmental, one communal, and one has been classified under 'other matters'. Ica has no record of social conflicts linked to mining. It therefore occupies the third and last place among the prioritized departments, based on the latest DPP conflict report.

Regarding the future investment portfolio of mining projects, Apurímac has a joint investment potential of US$ 10.199 billion, ahead of Huancavelica with US$ 655 million and Ica with US$ 140 million.

As we can see, Apurímac is home to the largest number of mining investment projects, both in operation and projected, compared to Huancavelica and Ica. The department also has the highest rate of mining conflicts according to DPP reports. According to MINEM (2023), 91% of the mining workforce in Apurímac is foreign to the department and only 9% is of local origin. In Huancavelica, the formal mining workforce is 50% local and 50% foreign. Lastly, the 2023 Mining Yearbook states that 34% of the mining workforce in Ica is local and 66% foreign.

The largest economic investment in terms of mining is in Apurímac. At the same time, Apurímac and Huancavelica are the departments with the largest Quechua-speaking indigenous population at the national level. Apurímac is the department with the most active conflicts linked to mining activities. Table N° 3 presents a summary of the main companies operating in the prioritized departments.



ICA RIVER, PERÚ

Table N° 3: Main mining projects in prioritized departments - December 2023

MINING COMPANY	CONCESSION'S NAME	MINING STATUS	MINING STATRUM	BACKGROUND	ORIGIN	LOCAL RELATIONS	TIME IN THE AREA	MAIN CONFLICTS
Ica								
Marcobre	Mina Justa	Extraction	General regime	Cumbres Andinas S.A.C	Peru	Good relations with the population of the Marcona District	10 years	No record
Nexa Resources Peru S.A.A.	El carmen	Evaluation	General regime	MILPO company	Brazil	Good / only exploration work	5 years	No record
MINERA SHOUXIN PERU	Shouxin Ext.	Construction	General regime	Union of mining companies	China	Regular/ accused of spills by its own workers	12 years	Labor
Apurimac								
Southern Peru Copper Corporation Peru Branch	Los chancas	Prefeasibility	General regime	Owner company Grupo México S.A.B.	USA	Bad between the communities of Tapairihua and Tiaparo	+20 years	Miners/ communities
Minera Las Bambas SA	Las bambas	Extraction	General regime	Xstrata Copper	China	Bad / presents nine socioenvironmental conflicts	20 years	Peasant communities
El Molle Verde S.A.C.	Trapiche	Exploration	General regime	Buenaventura /owner of Molle Verde	Peru	Good / with the population of the Espinoza Medrano District	+20 years	No record
Panoro Apurímac S.A	Cotabambas	Exploration	General regime	Canadian mining company	Canada	Regular / with the community of Cochapata	7 years	Communal
Panoro Apurímac S.A	Antilla	Exploration	General regime	Canadian mining company	Canada	Regular / with the population of the Antilla District	16 years	No record
Minera Antares Peru S.A.C.	Haquira	Exploration	General regime	Antares Minerals/owner is the Canadian company First Quantum	Canada	Regular / with the populated center of Haquira	13 years	Conflicts with the Anabi mining company
Rio Tinto Mining and Exploration S.A.C.	Mara	Evaluation	General regime	Aluminum Corporation of China Limited and BlackRock	England	Unknown	2 years	No record
Sumitomo Metal Mining Peru	San Antonio	Evaluation	General regime	Business merger	Japan	Unknown	6 years	No record
HUDBAY PERU S.A.C.8	Constancia	Production	General regime	Purchase of the mining project	Canada	Regular / conflicto with the peasant community of Pampamarca	13 years	Peasant communities
Huancavelica								
Nexa Resources Peru. S.A.A.	Pukaqaqa	Exploration	General regime	MILPO company	Brazil	Regular / with the communities of the Ascensión District	4 years	Local authorities
Operadores Concentrados Peruanos	Cobrizas	Extraction	General regime	Doe Run Perú	Peru	Good / with the communities and authorities of San Pedro de Coris	2 years	Informal/ illegal

Source: MINEM (2023)
Authors' own elaboration

1.3

PROGRESS OF MINING FORMALIZATION PROCESS

Ica has made greater progress about the number of miners who have achieved formalization. One of the reasons that may explain this is that, in this department, agricultural lands do not run into mining areas. Another possible factor is that the department's indigenous population is barely 6%.

The Comprehensive Mineral Formalization process was created by LD N° 1293, published on December 30, 2016, which declares the formalization of small-scale and artisanal mining activities of national interest, creating REINFO.

SD N° 018-2017-EM, published on June 1, 2017, specifies the six requirements for this process. As of January 2024, there are 87,082 miners registered in REINFO at the national level. Of these, 72,735 miners have had their registration suspended for not progressing with the formalization process, and only 14,347 are currently registered in REINFO. Table N° 4 shows the number of miners registered in REINFO in the departments prioritized in this research.

Table N° 4: REINFO registrations by 2024

DEPARTMENT	SUSPENDED	%	VALID	%	REINFO	%
Apurimac	6,677	7.7	859	1.7	7,536	8.7
Ica	2,327	2.7	383	0.4	2,710	3.1
Huancavelica	1,626	1.9	260	0.3	1,886	2.2

Source: MINEM (February 4, 2024)

Table n. 4

There are low numbers of miners currently in the formalization process in the prioritized departments. The department with the highest number of miners in the formalization process is Apurímac (8.7% of the national total), but only 1% (1,758 miners) have a valid registration.

In the case of Ica and Huancavelica, the numbers of miners with valid registration are below 0.5% of the national total, demonstrating that the miners have not remained in the process.

We can also see that only 1,880 miners are formal concession holders. In addition, MINEM counts 9,216 mining partners declared by those registered in the REINFO, making a total of 11,101 formal miners. These figures do not specify whether the miners are mining for copper, gold or another mineral. The following table shows that the number of miners is very low.

Table N° 5: Number of formalized miners

DEPARTMENT	HOLDER	PARTNER	TOTAL	% TOTAL
Apurimac	15	383	398	3.1
Ica	32	0	32	0.3
Huancavelica	13	0	13	0.1

Source: MINEM (February 4, 2024)

Table n. 5

Apurímac is the department with the largest number of miners in the formalization process, but it has only 15 formal miners. Its level of formality is 3.1% of the national total. Ica has 32 formal miners, but reaches only 0.3% of the national total, and Huancavelica has 13 formal miners, 0.1% of the national total.

1.4

ASMC POPULATION ESTIMATE

It is useful to highlight that there are no official figures from the Peruvian government that account for the number of ASMC miners. The Peruvian and international literature on ASM is largely focused on gold, and does not differentiate the presence of communities working with other metals such as copper, zinc or cobalt. We can state that the figures for gold provide little reliable demographical data.

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A significant effort to define small-scale mining population estimates has been undertaken by Hruschka (2022), who, through an ASM Inventory, indicates that there are approximately 49 million miners in 81 countries of the world (range: minimum 42.5 million, maximum 63.8 million), 26% of whom are women. Other authors also agree on these global figures. Fritz et al (2018) state that approximately 40.5 million people are involved in ASM activities. The situation in Peru is complex, because there is no consensus on the number of miners in the country. Table N° 6 shows how different specialists have treated mining population estimates in the last 20 years.

Table N° 6: ASM population estimates in Peru

AUTHOR	ESTIMATE	YEAR
Alliance for Responsible Mining (ARM)	There are approximately 300,000 miners in Peru.	2022
SBGA	575,000 miners and one million people depend on the industry.	2020
Planet Gold Peru	250,000 miners and one million families involved.	2020
Sociedad Peruana de Derecho Ambiental	150,000 miners and 300,000 people dependent on this economy.	2014
Cremers et al	60,000 miners.	2013

Source: ARM (2022); SPDA (2014); Planet Gold Peru (2020); SBGA (2020); and Cremers et al (2013).

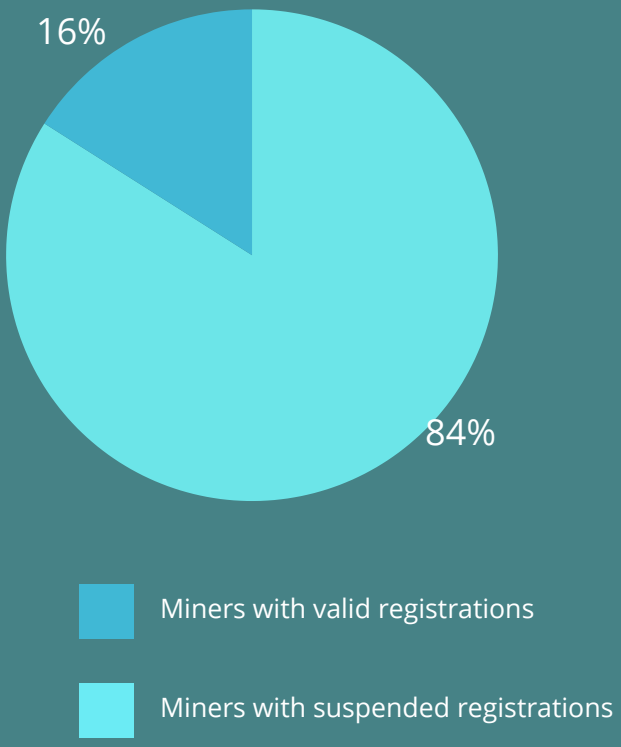
Table n. 6

Another referential estimate source is MINEM (2023), which indicates that 87,082 miners are registered in the REINFO throughout Peru, 84% of whom (72,735 miners) have had their registrations suspended and only 16% of whom (14,347) have valid registrations. These figures do not discern whether they are gold or copper miners, and only provide quantitative aggregate data. They also refer only to the miners registered in the REINFO system.

In accordance with the recommendations of Hruschka (2022), a minimum and maximum range is identified to define the population of small-scale miners in Peru. According to Table N° 6, the most conservative number of miners was 150,000 for 2014, a figure that is now 10 years old. Mining activity has expanded in the last decade, but this economy has also become very technical (at the formal, informal and illegal level). This suggests that the population estimate has increased by 30% on the most conservative figure. It can therefore be inferred that the current population of miners will be approximately 200,000 people (minimum range of 180,000 people and maximum range of 230,000).

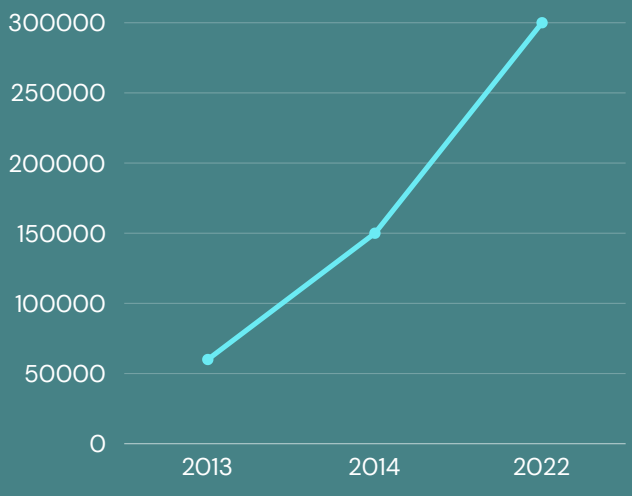
However, it is not possible to argue to what extent ASMC miners differ from gold miners, or those involved in the extraction of other minerals. The research results indicate that miners also obtained copper in the process of gold extraction, but that it was discarded due to low grades or low profitability.

ASM Miners registered in the REINFO system:



Source: MINEM [2023]

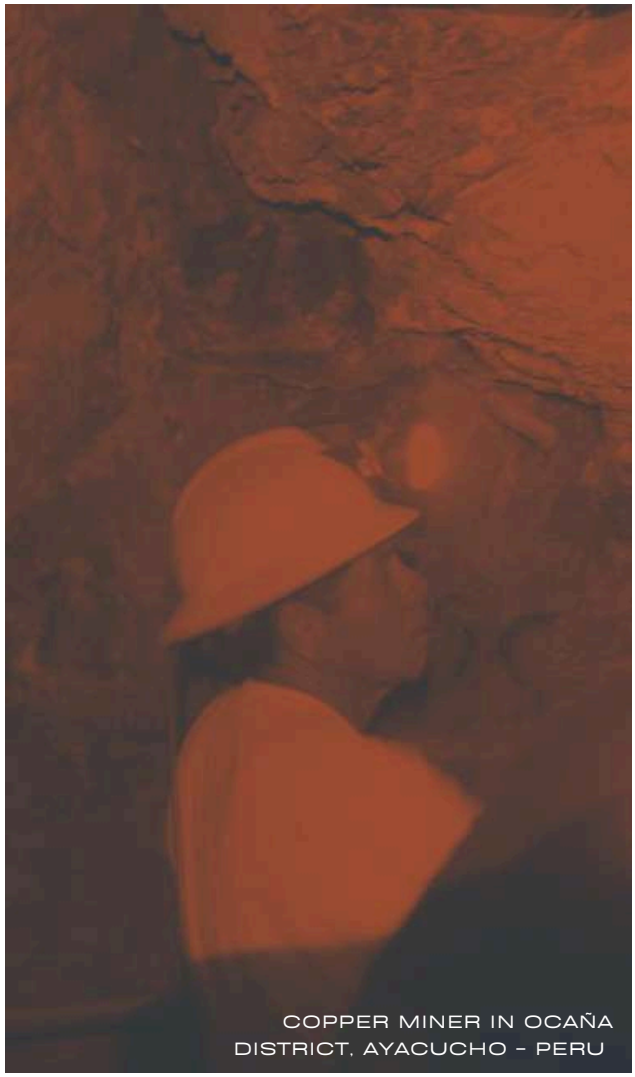
Population of ASM Miners over the past years:



Source: ARM [2022]; SPDA [2014]; Planet Gold Peru [2020]; SBGA [2020]; and Cremers et al [2013].

This particular characteristic has been increasing with large-scale extractive projects in priority regions (Apurímac and Huancavelica), where a new stakeholder has become established: peasant communities. It is also important to indicate that high copper prices (from cts.US$/lb 166.0 to cts.US$/lb 304.0), which increased in 2006, were decisive for the considerable growth of the ASMC population.

In conclusion, we can state that there are approximately 100,000 ASMC miners in Peru, of whom 50,000 combine the extraction of gold and copper, and 50,000 are dedicated exclusively to the extraction of copper. Miners only dedicated to copper extraction are limited to the departments of Apurímac and Huancavelica, while miners who combine gold and copper are present in different regions.



COPPER MINER IN OCAÑA DISTRICT, AYACUCHO – PERU

1.5

ASMC PRODUCTION AND INTERNATIONAL COPPER PRICE

ASMC production in the last 27 years has been very variable, as can be seen in Table N° 7.

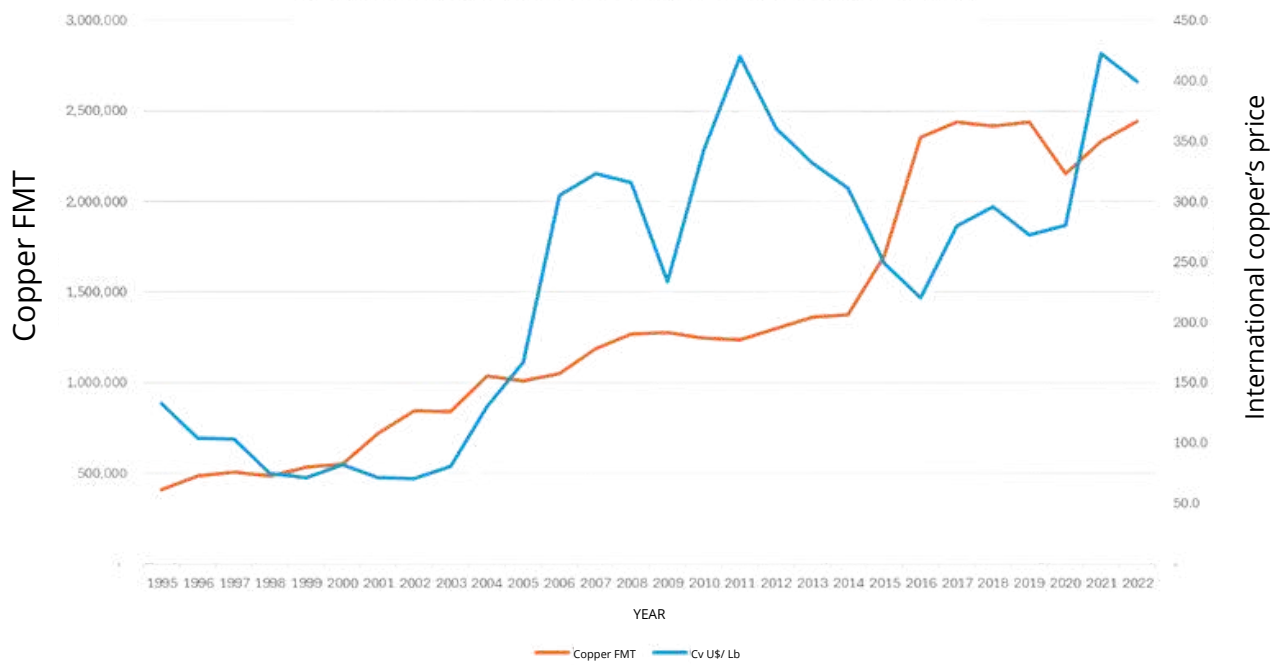
Table N° 7: Copper production and price 1995 – 2022

YEAR	LARGE- AND MEDIUM-SCALE MINING	MEDIUM-SCALE MINING*	SMALL-SCALE MINING	ARTISANAL MINING**	TOTAL	CTS.US$ / POUND
1995	382,721	26,848	124	-	409,693	133.1
1996	452,062	36,674	120	-	485,595	104.1
1997	469,406	26,848	419	-	506,499	103.2
1998	457,552	25,494	292	-	483,338	75.0
1999	509,489	26,480	418	-	536,387	71.3
2000	522,909	30,783	232	-	553,924	82.2
2001	685,422	36,859	75	-	722,356	71.6
2002	807,774	36,390	389	-	844,553	70.7
2003	798,852	43,264	462	-	842,578	80.7
2004	1,035,093	-	481	-	1,035,574	129.9
2005	1,009,447	-	452	-	1,009,899	166.9
2006	1,048,464	-	8	-	1,048,472	304.9
2007	382,721	-	147	-	409,693	133.1
2008	1,267,464	-	377	26	1,267,867	315.5
2009	1,274,189	-	2,018	42	1,276,249	133.1
2010	1,244,014	-	3,095	75	1,247,184	342.2
2011	1,231,765	-	3,580	-	1,235,345	420.2
2012	1,295,688	-	2,876	-	1,298,564	360.6
2013	1,359,482	-	3,971	-	1,363,453	332.1
2014	1,373,149	-	4,225	-	1,377,374	311.3
2015	1,695,890	-	4,050	-	1,699,940	249.2
2016	2,349,614	-	3,346	-	2,352,960	104.1
2017	2,437,479	-	2,703	-	2,440,182	133.1
2018	2,413,083	-	3,798	-	2,416,881	104.1
2019	2,431,423	-	6,502	-	2,437,925	133.1
2020	2,148,129	-	5,823	-	2,153,952	104.1
2021	2,329,886	-	3,258	-	2,333,144	133.1
2022	2,439,682	-	5,428	-	2,445,110	104.1

Source: MINEM [2004], [2010] and [2022]

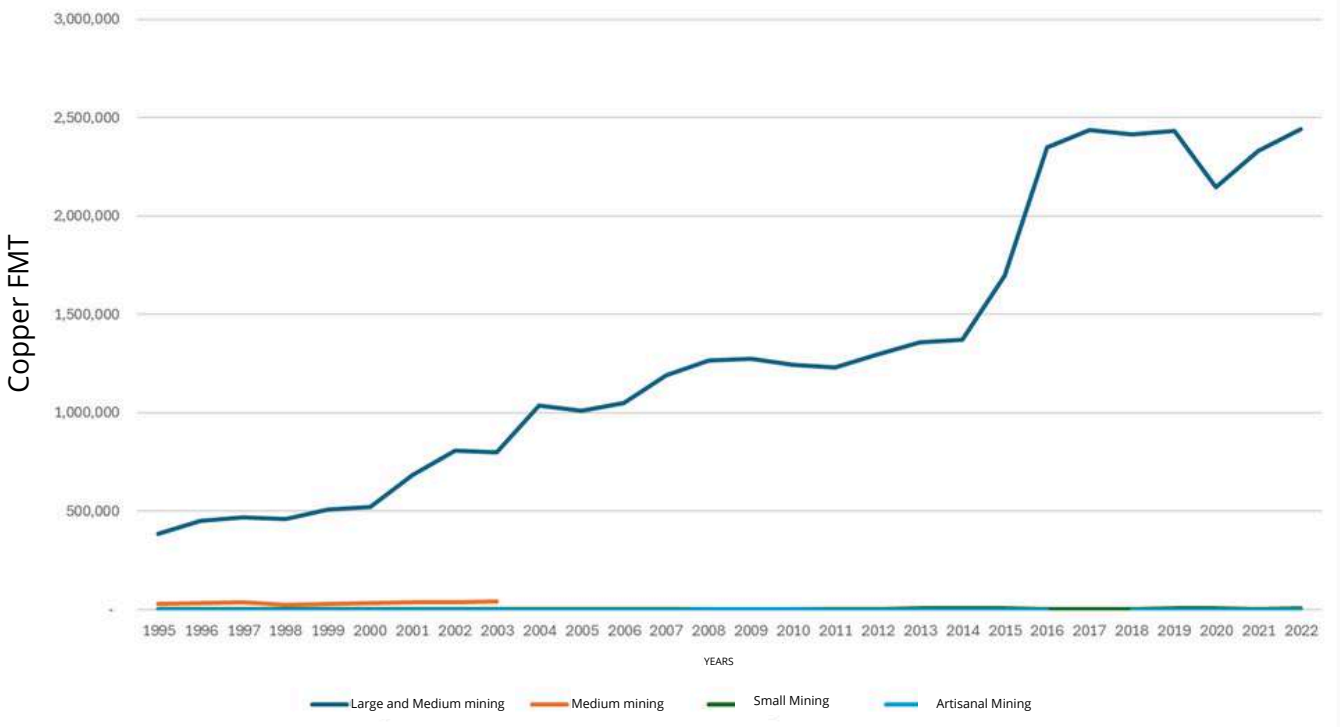
*Between 1995 and 2003, medium-scale mining was a different stratum from large-scale mining. From 2004, both strata became one.
**Artisanal mining only declared production between 2008 and 2010.

Graphic 1: Production of copper in Peru and international price between 1995-2022



Graph N° 1 shows that the international price of copper began to rise constantly from 2004, when a pound cost cts.US$ 129.9. From then on, the trend is towards growth, although two falls in price can be identified in 2009 (cts.US$ 233.5) and 2016 (cts.US$ 220.6). These price behaviors coincide with peaks at the start of new mining projects, since Peru's copper production has shown constant growth from 1,035,574 FMT (2004) to 2,445,110 FMT (2022).

Graphic 2: Production of copper by strata in Peru between 1995-2022



The leading stakeholders in Peruvian mining are large- and medium-scale operations. It is worth noting, as Graph N° 2 shows, that medium-scale mining was independent of large-scale mining between 1995 and 2003, coinciding with the first considerable rise in international copper prices. Formal artisanal mining, on the other hand, only presents production data for 2008 (26 FMT), 2009 (42 FMT) and 2010 (75 FMT), for a single miner named Óscar Quispe Condori. This miner reported extraction in a concession named Raquel, located in the Yauca del Rosario District of the Ica Department.

In official figures, there is no further information reported on artisanal copper mining production.

Between 1995 and 2022, small-scale mining has almost always represented between 0.1% and 0.2% of Peru's copper production, a figure almost imperceptible in domestic accounts. According to MINEM (2023), this formal production is minimally located in a few regions, as indicated in the following Table N° 8.

Table N° 8: Small-scale mining companies that declare production – 2022

NAME OF REPRESENTATIVE	CONCESSION	DEPARTMENT
Amapola 5 S.A.C.	Amapola 5	Ancash
El Pacífico Dorado S.A.C.	Miriam Pilar Uno	Ancash
Minera Huinac S.A.C.	Quilcay n.1	Ancash
Minera Pararrayo Sociedad Anónima Cerrada - Minera Pararrayo S.A.C.	Pararrayo	Ancash
Minera Shuntur S.A.C	Adriana	Ancash
Sociedad Minera de Recursos Linceares Magistral de Huaraz S.A.C.	Aquia	Ancash
Compañía Minera Scorpion S.A.	Don Lucho	Ayacucho
Compañía Minera Scorpion S.A.	Eliana	Ayacucho
Procesadora Costa Sur S.A.C.	Costa Sur	Arequipa
LJM Metales S.A.C.	LJM Metales	Ica
Minera Fercar E.I.R.L.	Raquel	Ica
Veloche Group S.A.C.	Angeles x	Ica
Aurífera Sacramento S.A.	Sacramento	Huancavelica
Minería Corporativa S.A.C.	Cope Mina	Huancavelica

Source: MINEM [2023]

According to MINEM (2023), the departments where small-scale mining is located are Ancash (seven concessions), Ayacucho (two concessions), Arequipa (one concession), Ica (three concessions) and Huancavelica (two concessions).

In that sense, all ASMC production described in the following sections (case studies) is informal and, in some cases, illegal. There is ASMC production that is not included in national accounts, produced by around 100,000 miners, which needs to be formalized and reflected.

ICA, PERU

2. CASE STUDIES

2.1

CONCENTRATOR PLANTS IN ICA (PISCO AND NASCA)

As of January 31, 2024, this study had identified 26 processing plants in Ica that correspond to artisanal mining producer (AMP) and small-scale mining producer (SMP) classifications, according to INGEMMET's GEOCATMIN portal. In Pisco, there are three plants and in Nasca 11 formal plants registered in MINEM. It was not possible to establish the number of plants that provide an informal service, or the number that only provide a milling service. The lowest number of concentrator plants in the Ica Department are located in the Pisco District. Table N° 9 shows the plants with a MINEM unique identification code:

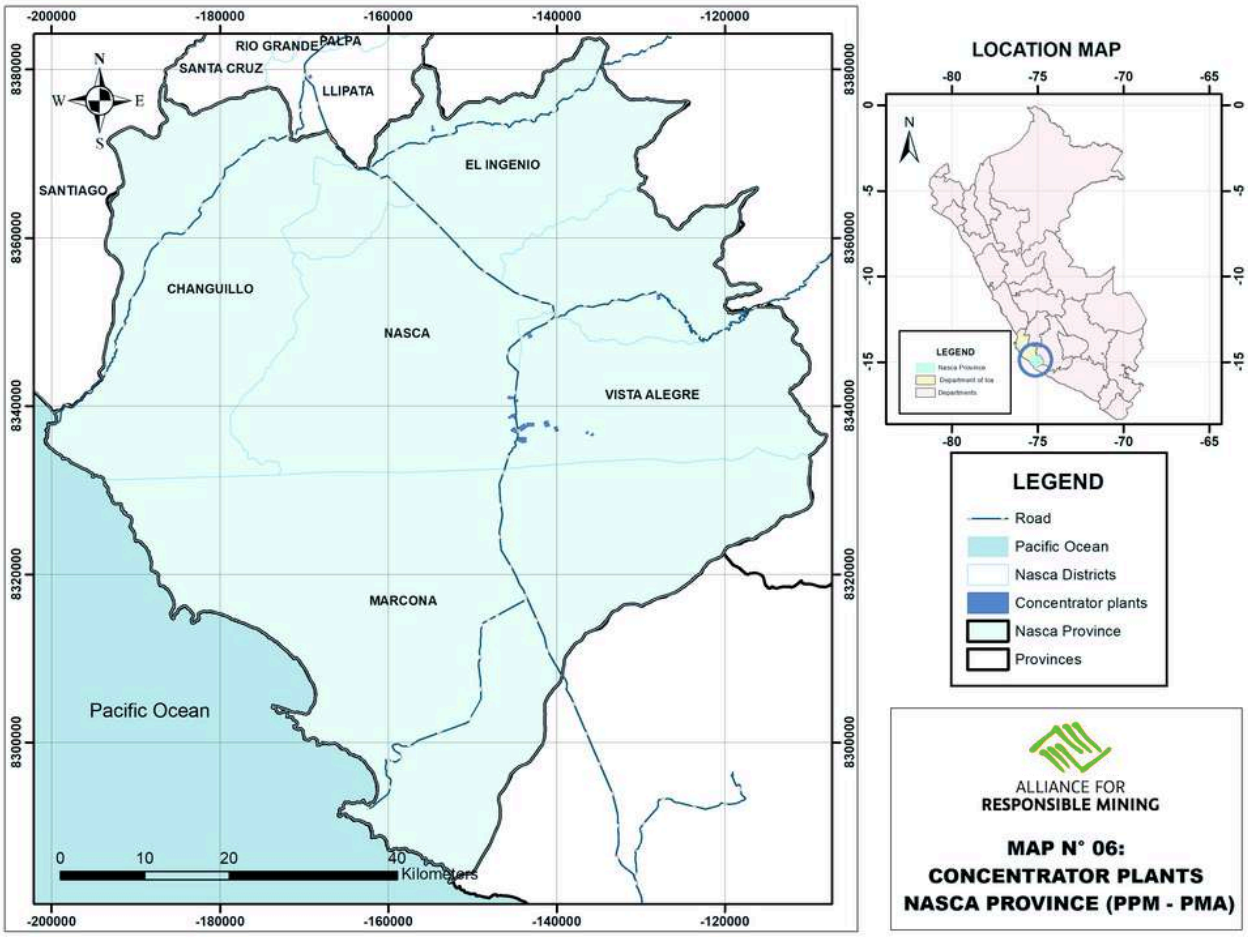
Table N° 9: SMP and AMP processing plants in Ica

CODE	REPORT DATE	CONCESSION	CONCESSION HOLDER	PROVINCE	DISTRICT
P0101063	30/05/1974	San Jose Concentrator Plant	Transformaciones de Cobre S.A.C.	Nasca	Vista Alegre
P0102273	18/10/1996	Union Nazca	Julio Ernesto Larrea Galarza	Nasca	Vista Alegre
P0100345	30/11/1990	Llipata Plant	Dorato Llipata S.A.C.	Palpa	Llipata
P0000306	11/05/2006	Perusia Metallurgical Plant	Compañía Minera Alpamayo S.A.C	Ica	La Tinguiña
P610001111	05/12/2011	Victoria I	Procesadora Santa Ana S.A.C.	Nasca	Vista Alegre
P610000412	16/07/2012	Centauro Concession Plant	Peru Metal Trading S.A.C.	Nasca	Nasca
P610000212	02/02/2012	La Pampa	Cuprica S.A.C.	Ica	Salas
P110000117	28/04/2017	Centauro	Peru Metal Trading S.A.C.	Nasca	Nasca
P610000110	13/10/2010	Tulin Pilot Plant	Capitalaz S.A.C.	Nasca	El ingenio
P610000611	31/08/2011	Santa Maria Plant	Luis Manolo García Márquez	Nasca	Vista Alegre
P610000911	09/11/2011	San Hilarion Concentrator Plant	Consorcio Agrominero San Hilarión S.A.C.	Nasca	Nasca
P610000210	13/10/2010	Santa Elena Processing Plant	Cirila Elena Aybar Molina	Nasca	Vista Alegre
P110000218	30/05/2018	Sol De Ica Processing Plant	El Olivar Imperial S.A.C.	Nasca	Nasca
P110000417	24/11/2017	Minerales De Oro Saramarca Ii Plant	Minera Inmaculada Concepción Y Milagrosa E.I.R.L.	Palpa	Palpa
P0103043	30/07/1991	El Inka	Minería Y Exportaciones S.A.C.	Nasca	Vista Alegre
P610000111	07/02/2011	Poroma Perú	Poroma S.A.C.	Nasca	Vista Alegre
P610000510	20/10/2010	Minerales Paracas Sac	Italica Societa Mineraria del Perú S.A.C.	Pisco	San Andrés
P610000112	10/01/2012	Caracol Plant	Minera Caracol S.A.C	Ica	La Tinguiña
P110000217	18/05/2017	Minerales De Oro Saramarca I Plant	German Ore Parra	Palpa	Palpa
P110000418	30/10/2017	Santa Teresa Processing Plant	JENNIE JANNET CAPCHA HUARCAYA and others	Nasca	Vista Alegre
P110000518	28/11/2018	Julia Esther Processing Plant	Vista Gold S.A.C	Nasca	Vista Alegre
P110000318	31/12/2014	FECMA Processing Plant	Compañía Cupriaurifera SAC	Nasca	Nasca/vista A
P110000618	09/10/2014	Santa Maria Processing Plant	Minera Santa Maria SAC	Nasca	Vista Alegre
P610000811	17/10/2011	Ljm Metales	Ljm Metales S.A.C.	Pisco	San Andrés
P110000718	07/11/2018	Mercurio	Mercurio E.I.R.L.	Nasca	Nasca
P110000317	23/09/2016	Oasis Processing Plant	AGROPEX SAC	Nasca	Nasca

Source: GEOCATMIN, processing plant database.

This research has confirmed that Nasca is the main destination of informal copper from the Ica Department, and others such as Apurímac and Huancavelica, as it has concentrator plants that provide a copper processing service using flotation systems.

Copper concentrator plants are mainly located south of the city of Nasca, and some of their accesses are visible from the Pan-American Highway. Map N° 6 below shows the location of the concentrator plants in Nasca registered in MINEM.



Map n. 6

Concentrator plants are facilities in which the ore that arrives in its raw state passes through a series of processes (usually crushing, grinding and flotation) that allow a higher concentration of the mineral to be obtained. The product obtained in these plants is called concentrate (usually with a copper content of 30%).

After grinding the stone or rock that contains the mineral, it then passes through a process called flotation, which is used in all concentrator plants. Flotation is a physiochemical separation process in which, being hydrophobic, the copper sulfide particles connect to air particles that are injected into the process and float, generating a foam that concentrates the mineral (Media Met, 2016).

Concentrator plants operate by providing a service for miner to use their facilities, only charging for the use of their equipment. All plants operate using the same process, which consists of: i) receiving the copper ore at the facilities at a date agreed upon with the miner; ii) performing laboratory tests; iii) agreeing on a price for the mineral to be processed; iv) having the copper concentrate ready after 20 to 30 days; v) delivering the copper concentrate; vi) selling the copper concentrate; vii) transporting the copper concentrate for sale, if applicable.

In Nasca, there are both plants that operate formally – with authorization from MINEM, as they appear on their official list – and others that do not appear on the MINEM list. This could be because they are in a process of formalization or because they are illegal.

Formal plants have two options: to buy the copper ore from the miner and process it directly through middlemen (subjects independent of the plant, but with an implicit agreement to pass the ore to the plant); or to buy the copper concentrate from the miner, and sell the processed tailings as copper concentrate. The copper concentrate is transported to Lima (port of Callao) or other ports with export authorization.

Informal or illegal concentrator plants seek to resell the copper concentrate to formal plants.

IThese are gray areas, because it is not known how they are able to export without a limited production capacity (plants are authorized to process between 150 and 300 MT/D). Given the lack of data, we suggest that exports are perhaps greater, or production is being stored. A characterization of the supply chain of copper processing plants is beyond the scope of this study and deserves further research.

Concentrator plants offer miners a processing service for obtaining copper concentrate. This service is generally used by miners, especially in the Andean zone, and also by intermediaries, people who buy the raw mineral in the same mines and transfer it to concentrator plants. These intermediaries save the miners the task of transporting ore and renting the plant to process it. Miners from Nasca have the possibility of using the plants' services, as the cost of transportation is reduced, although coastal miners state that the service also represents a significant expense.

All plants operate using the same process: 1. Receive copper, 2. Conduct laboratory tests, 3. Agree on a processing price, 4.Prepare copper concentrate [20-30 days] and 5. Deliver and sell it.

As mentioned above, it is necessary to differentiate miners from the coast and those from the Andean zone in the concentrator plant system. The former clearly have the possibility of obtaining a product with less investment, which allows them to obtain greater profits. This is what is most attractive to them about the plants. On the other hand, the latter are more affected by the cost of transportation, given the greater distance. However, if their ore has a good grade, they can earn as much as miners from the coast.

During fieldwork both in Nasca and in the Andean regions of Apurímac and Huancavelica, ASMC miners provided information on the conditions and operating prices of the plants. The miners state that the minimum tonnage accepted by concentrator plants to make concentrate is 100 tons. In addition, they have to pay for the use of the plant (including rental, grinding and deductions for impurities) at a cost of approximately US$30 per ton.

+ Control over the recovering process

= More income

Nasca, PERU

Another limiting factor is the fact that concentrator plants do not usually compensate miners for the presence of other metals. The miners identify this as non-transparent. They argue that the plants keep the “tail” metals, which could be lead, zinc or gold. This is a motivation for the miners to request that the Andean zone have a plant for them to use that is close to their extraction centers. They identify it as a necessity to have control over the process of recovering the metals contained in the ore in order to obtain greater income.

During the course of the research, it was possible to identify two intermediaries in the plant-mine relationship who intervene directly in the value chain.

These intermediaries affect the profits and profitability of artisanal copper miners, as they are who ultimately absorb the expenses. The first is the collector; this stakeholder makes an agreement with the miner to take the ore from the mines at a low price and transport it to the plant to be processed. This agreement is their main source of profit. The collector is an important stakeholder who also operates in the coastal zone, although they are more widespread in the Andean zone. They coordinate with both miners and transporters.

The second stakeholder is the transporter. These individuals or companies offer their services to transport ore to the plants. They can be hired by both the miners and collectors. These stakeholders usually establish their rates according to the distance between the mine and the concentrator plant, which significantly affects the profitability of the operation. They tend to communicate more with the plants and intermediaries than with the miners themselves. The extraction and processing of ore is thus carried out in an atomized manner. There are many miners, and individually they have limited bargaining power vis-à-vis the collectors and transporters. The situation described makes the miners believe that these two intermediaries take advantage of their negotiating position to the detriment of the miners.

Miners pay high prices for the concentrator plants services. As in Nasca, this issue is identified as a limitation by the Huancavelica miners, as they depend on a plant that is not their own.

The concentrator plants in Pisco operate in the same way as in Nasca, using a flotation system. The operating characteristics are therefore similar. We were able to identify that this service is used by Huancavelica miners and intermediaries. In general, miners are attracted to the possibility of making a higher profit by commercializing a mineral with a higher degree of purity. However, this can compromise their profitability, as many Huancavelica miners pointed out that the Pisco plants have very expensive rates. On top of transportation costs from mining centers, this generates a reduction in their profitability. As in Nasca, this issue is identified as a limitation by the Huancavelica miners, as they depend on a plant that is not their own.

In Pisco, the collectors and transporters are important stakeholders who coordinate the process of obtaining copper concentrate. As highlighted in the case of Nasca, for ASMC miners their participation is important, since they directly affect the profitability of their operations. For this reason, miners tend to have a close relationship with these two stakeholders, in order to improve their negotiating position.

One fundamental difference is that concentrator plants in Nasca are more numerous than in Pisco. It can be assumed that this is, firstly, because there is greater price competition and, secondly, due to the proximity of the copper deposits, which are closer to Nasca than to Pisco. A third reason is that the accesses to the Nasca plants are located on the Pan-American Highway and are visible from the road. This does not occur in Pisco, where the accesses are located kilometers from the highway, in areas such as San Andrés. Finally, we can see that, to a greater extent, Nasca receives ore from the regions of Ayacucho, Apurímac and part of Huancavelica, and Pisco receives minerals from Huancavelica and other areas surrounding Ica, forming economic groups.

SOLMIN: A copper Mine in Peru

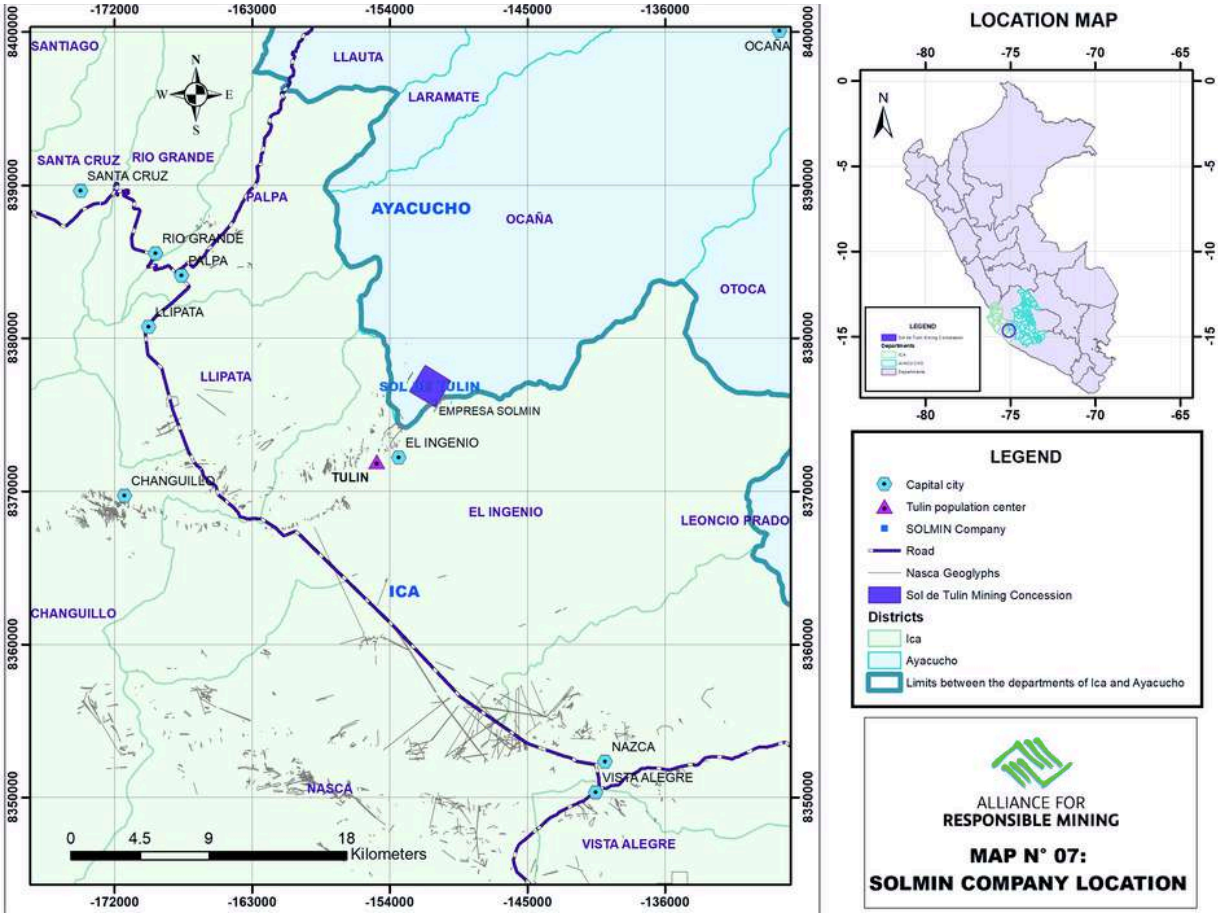
The complex situation of copper concentrator plants is not new in Peru. INCITEMI (1977) carried out a study commissioned by MINEM to address the limitations of the production of concentrates, and a market analysis to position Peru within global production. The context of this research was different to ours, since, at the time, the Peruvian government was focused on commercializing the product. It is of interest, however, because of the logic of the Peruvian government in supporting the formalization of medium- and small-scale mining.

2.2

SOLMIN EIRL

2. 2. 1 Location

This mining concession is located between two departments. A large part of its extension lies in the Ocaña District, Lucanas Province, Ayacucho Department, and a smaller part in the El Ingenio District, Nasca Province, Ica Department. The entrance to the SOLMIN EIRL mine is located in the town of Tulin, El Ingenio District. The town has a census population of 1,014 inhabitants, of whom 511 are men and 503 are women (INEI, 2018). The mining operation is located 30 minutes from Tulin. It is accessed via a dirt road, and different informal mining operations can be seen on route. See Map N° 7.



map n.7

The mine is located within the “Sol de Tulin” mining concession owned by the S.M.R.L. Estrella de Pataz N° 2 mining company, hereinafter Estrella de Pataz. According to MINEM’s UADA, this concession has the code 010077401. It was first concessioned to Peruvian citizen Carlo Muncher Ricketts in 2001. Then in 2005, it became the property of the Estrella de Pataz company, which entered into a mining assignment contract in 2006 with the Caravelí SAC mining company for a period of 20 years. To date, ownership of the concession is in the hands of the Estrella de Pataz company, but the Caravelí mining company holds the extraction rights. According to the SUNAT registry (accessed on January 3, 2024), Estrella de Pataz is ex officio, and it is presumed that the company has not been involved in commercial activity since October 2023.

2. 2. 2 Legal status

SOLMIN EIRL has unique taxpayer register (RUC) number 20608742213 and is in the process of formalization. The company is registered in the REINFO with active status and unique identification code 010077401. The operation is also located in what MINCUL has called the “Nasca Archaeological Polygonal”, the area’s main archaeological area in which the famous Nasca Lines and Geoglyphs are found. The mining operation’s location has generated obstacles to its formalization. For this reason, the operation is waiting for an update to the polygon that would place them outside of the archaeological area, in order to continue with their formalization process. This process can take a long time in Peru.

SOLMIN has an IGAFOM that has not yet been approved by the DREM in Ayacucho. Observations have been raised by the responsible institutional body. SOLMIN does not have an extraction contract with the concession holder; however, it is worth specifying that the concession holder does not prohibit SOLMIN from working in the area of its concession. This refusal to establish any type of agreement with SOLMIN or to receive any type of compensation for the mining operation is presumably due to the fact that the concession holder does not seek to assume any responsibility in the face of accidents or negative events that could occur, and which could entail legal consequences.

During interviews with partners of SOLMIN, we observed that they have a long-term vision, in the sense that they are interested in attracting investment to their operation. During the research, they indicated that the main vein has a good future projection, which is why their principal interest is in enhancing mineral production. They also had a positive attitude with regard to its formalization, which is the reason why SOLMIN partners state that the purchase of inputs for mining extraction is carried out legally, and indicate that they are aware of their tax obligations. For them, more than an obligation, formalization represents an opportunity to attract investors and expand their mining operation.

2. 2. 3 Productive process

SOLMIN is an informal copper mining operation. Initially, it was dedicated to the extraction of gold for approximately 10 years, and copper was seen as a secondary mineral. Today, copper is the operation's main mineral. The mine produces on average between 130 and 150 oz of gold and 130 and 150 tons of copper concentrate per month. In terms of production, the mine extracts 3,000 tons of ore per month, with an average grade of 1.3% to 1.5% copper. The mine has seven operation levels, three operation fronts and is in the process of implementing its mining safety and hygiene, environmental management and operation planning systems. SOLMIN only extracts ore, and does not have a processing plant.

Thirty-five employees work in this mining extraction center, distributed in three work groups, on a single daily shift from 7am to approximately 5pm. To serve these workers, the company employs two cooks, who take turns to be head chef and assistant, in order to prepare the three daily meals that they provide the workers. The 35 workers sleep in camps provided by SOLMIN.

With regard to labor composition, our visit to the mining operation showed that the pit miners are all men between 18 and 40 years old, with Andean phenotypic characteristics. There is no control for the employment of minors under 18 years of age, but company authorities maintain that no one under 18 works there. We did not observe anyone under 18 years of age working in mining operations. Miners work with minimum safety measures; they have helmets and work boots, but they do not have safety clothing at work. During the visit, we observed that some worked with their torsos uncovered due to the heat in the deepest parts of the mine. Some chewed coca leaves, with the aim of reducing the physical effort caused by the activity. These circumstances suggest that the operation still has many technical improvements to implement.

We observed 10 women at the surface of the mine during the workday. The women work chipping the rocks to give them the dimensions required by the concentrator plants to grind the ore. Some of the rocks that emerge from the pit don't have the required dimensions, so the women reduce them to the dimensions requested by the processing plants.

2. 2. 4 Supply chain

With regard to the profitability of the mining operation, the interviews provided clear data that allow us to outline the operating costs and estimated profits for the mine's partner-operators. Firstly, SOLMIN could sell the raw ore it gets from the mine at US$10 per ton, due to the copper head grade of the mineral. SOLMIN therefore considers it a better alternative to take its ore to the concentrator plants in order to obtain copper concentrate to sell.

To transport its ore from the mine to the concentrator plants in Nasca, SOMIN uses a transporter that charges US$8 per ton. Before taking it to the concentrator plant, the miner has already established a relationship with a collector who helps to determine the best price the concentrator plant will offer for the ore. This collector charges 10% of the value of the mineral to place it in a plant.

The miner then pays up to US$30 per ton for the plant service (including rental, plant services and deductions for impurities), in addition to other deductions made by the plant. After a month processing the copper concentrate, the miner sells it to a buyer in Nasca, or to the processing plants themselves. They do not know the identity of their direct buyer, or the destination of their product.

Miners don't know the identity of their direct buyer, or the destination of their product.

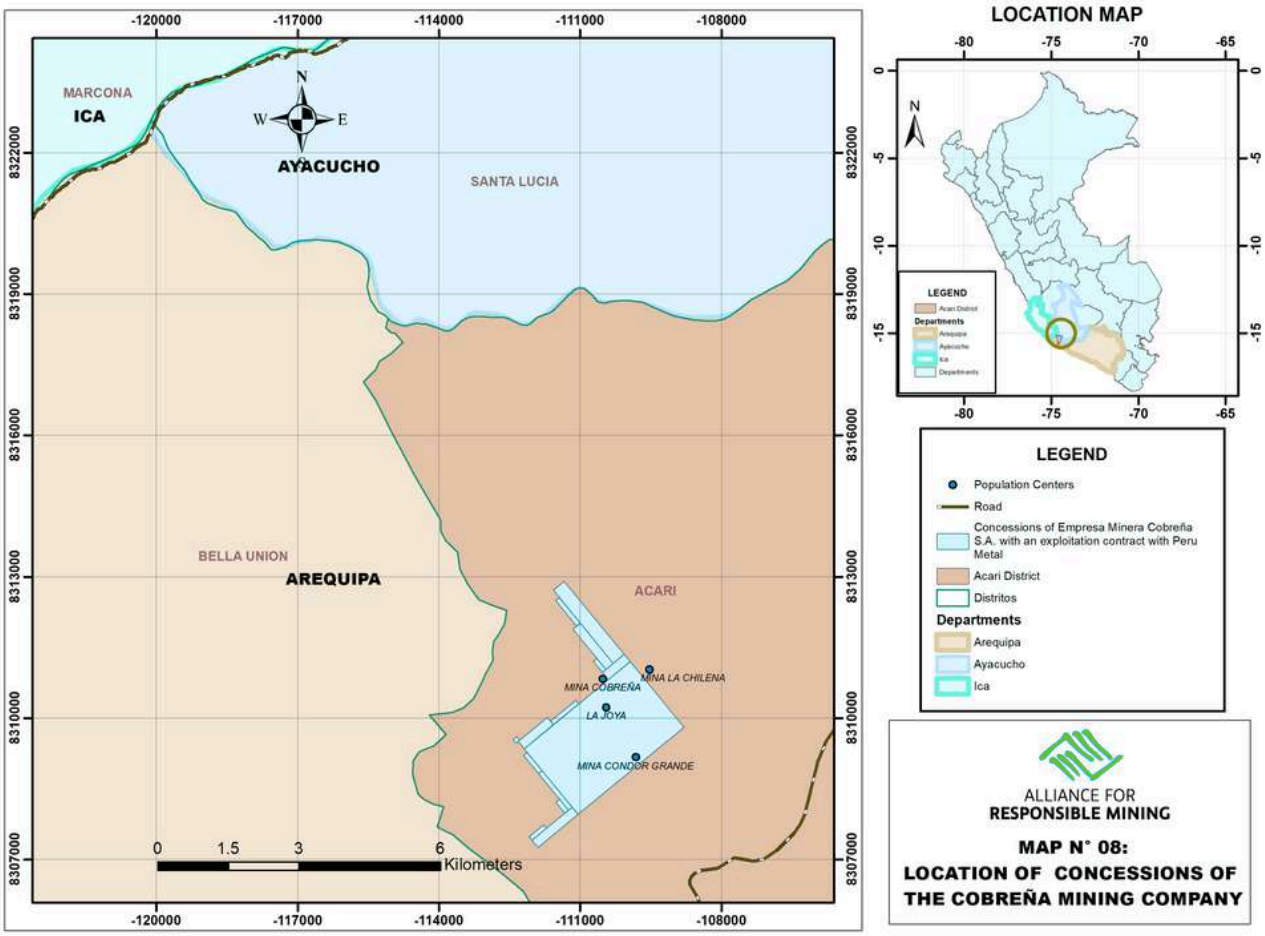
An aspect indicated by SOLMIN is that copper ore is always linked geologically to other minerals, such as gold, silver and zinc; therefore, processing the ore should result in the recovery of these by-products. However, concentrator plants do not pay for the content of the by-products, only for the copper. Therefore, copper miners are aware of how the plants benefit, as they do not pay for these tail minerals, a situation that has already been described above.

SOLMIN: A copper Mine in Peru

2.3

COBRE PAMPA SECTOR

2.3. 1 Location



map n.8

The sector called Cobre Pampa is located in the Acarí District, Caravelí Province, Arequipa Region. It is accessible from the town of Acarí, although some miners from Nasca stated that part of the Cobre Pampa Sector also corresponds to Nasca, as it is also accessible from the El Ingenio District. The miners explain that the Cobre Pampa Sector stretches from San Juan de Marcona (Ica) to Acarí (Arequipa), and they recognize the entire area as Cobre Pampa. We could not determine the number of miners in the area.

Local associations mention that there are more than 60 mining organizations in the process of formalization, and that they have extraction contracts with different concession holders. It is common, however, to hear that they have links with Peru Metal Trading S.A.C. This company has mining transfer contracts for 14 concessions with the owner, Cobreña SA mining company, according to File 589418 of the Public Mining Registry of the Ica Mining Concessions Archive. This contract is valid between October 2021 and January 2023. See Map N° 8

2.3. 2 Legal status

According to RDN° 298/70-EM.DG located in the UADA (MINEM central archive), the Cobreña SA mining company has a mining assignment contract with Peru Metal Trading S.A.C., signed on February 27, 2008, which involves the 14 mining concessions shown on the above map. Table N° 10 shows the 14 concessions that are part of the assignment contract.

The contract was entered into between the parties for a period of two years, and was valid from February 1, 2012 to January 31, 2014, with an option to extend.

I. The contract stipulates that the assignor will receive from the assignee a royalty of 6% of the sale price of the minerals that the concessionaire extracts.
In the event that the assignee authorizes third parties to develop mining activities, the royalty to be paid out by the assignee will amount to 4.8% of the sale price of the minerals that the third parties extract.

Table N° 10: concessions of Cobreña mining company given in assignment contract to Peru Metal Trading S.A.C.

LOCATION CODE	REPORT DATE	CONCESSION	LEGAL STATUS	LEGEND	SUBSTANCE	LOCATION
10000315Y01	23/06/1966	Cobre Pampa N° 1-D	D.M. Certified D.L. 109	Certified	M	Acarí, Caraveli
10000323Y01	23/06/1966	Cobre Pampa N° 1-G	D.M. Certified D.L. 109	Certified	M	Acarí, Caraveli
10005110X01	24/06/1966	Cobre Pampa N° 1-B	D.M. Certified D.L. 109	Certified	M	Acarí, Caraveli
10000325Y01	25/09/1963	Cobre Pampa N° 8	D.M. Certified D.L. 109	Certified	M	Acarí, Caraveli
10000314Y01	23/06/1966	Cobre Pampa N° 1-A	D.M. Certified D.L. 109	Certified	M	Acarí, Caraveli
10000318Y01	23/06/1966	Cobre Pampa N° 8-C	D.M. Certified D.L. 109	Certified	M	Acarí, Caraveli
10000322Y01	23/06/1966	Cobre Pampa N° 1-E	D.M. Certified D.L. 109	Certified	M	Acarí, Caraveli
10005101X01	23/06/1966	Cobre Pampa N° 1-C	D.M. Certified D.L. 109	Certified	M	Acarí, Caraveli
10000317Y01	24/06/1966	Cobre Pampa N° 8-B	D.M. Certified D.L. 109	Certified	M	Acarí, Caraveli
10005111X01	24/06/1966	Cobre Pampa N°8-A	D.M. Certified D.L. 109	Certified	M	Acarí, Caraveli
10003779X01	31/08/1963	Cobre Pampa N° 1	D.M. Certified D.L. 109	Certified	M	Acarí, Caraveli
10000319Y01	23/06/1966	Cobre Pampa N° 8-D	D.M. Certified D.L. 109	Certified	M	Acarí, Caraveli
10000316Y01	23/06/1966	Cobre Pampa N°1-H	D.M. Certified D.L. 109	Certified	M	Acarí, Caraveli
10005104X01	23/06/1966	Cobre Pampa N° 1-F	D.M. Certified D.L. 109	Certified	M	Acarí, Caraveli

Source: RDN° 298/70-EM.DG located in the UADA (MINEM central archive)

This same file states that Peru Metal Trading S.A.C. entered into extraction contracts with different companies and individuals between 2012 and 2022. In 2012:

Ruben Tello Torres (DNI: 22076808); TRANSMIN ROMP EIRL. In 2013: Sociedad Minera Lucia SRL; MISIFOR SRL; Empresa Minera Otapara SRL; OPERMIN Nueva Luz EIRL; Juan Manuel Zoca Montoya (DNI 22065857); Contrata Minera APROMIACO SRL; Minera e Inversiones Hércules EIRL; Minera Real Segovia SAC. In 2014: TRANSMIN ROMP EIRL; Lola Atauje Crisostomo de Tamayo.

Prudencia Jauregui Ayala; Operador Multiservicios JELIMAX SRL; Elena Justina Salgado Monzón; Negocios e Inversiones Juanita; GAL Consultores SAC; German Humberto Sosaya Armancanqui; Minera Nazca SA; Ruth Quispe Aguilar; Iván Bustamante Montoya; Gabino Tito Guzman Rodriguez; Minera La Cortada Santa Rosa SRL; Minera Hermanos Aquino Guerra; Empresa Comercializadora de Minerales y Servicios Generales Sebastian SAC; JULLIET SAC; Exploraciones, Explotaciones y Comercialización Mineras del Sur SAC; Minera Magika EIRL; Concepción Rodas Rojas (DNI 22095995).

Jesús Augusto Perez Cuaresma (DNI 80632527); Daniel Coaquira Mamani (DNI 02413065); César Augusto Cervantes Arteaga (DNI 21526403); Julio Jaccya Manjo (DNI 22071041); Sociedad Ópalo Andino Comercial de Responsabilidad Limitada. In 2015: Inversiones y Representaciones J.M SRL; Carlos Alberto Jacgia Manjo (DNI 80018066); Juan Manuel Zoca Montoya; Inversiones CLAYMAN SRL; J&E Minerales SRL; Operaciones Mineras y Servicios Melany EIRL; Elena Justina Salgado Monzón; Minera Real Segovia SAC; Minera ASIRI DCHAPI EIRL; Nestor Raúl Carazas Durand; Lola Atauje Crisostomo de Tamayo; Multiservicios JELIMAX SCRL; Inversiones Hércules EIRL; OPERMIN Nueva Luz EIRL; José Luis Huamán Guillen (DNI 40111603). Empresa Minera Emanuel EIRL; José Ángel Ccencho Mitma; Agustin Machaca Cari (DNI 22069992); Exploraciones y Comercialización Mineras del Sur SAC. In 2018: Minera APROMIACA SRL. In 2019: Empresa Comercializadora de Minerales y Servicios Generales Sebastián SAC; Empresa Minera Otapara SRL; Transporte y Minería ROMPEQUINCHA SAC & TRANSMIN ROMP SAC; OPEMIN Nueva Luz EIRL; Minera Real Segovia SAC; Rubén Tello Torres; German Humberto Sosaya Armancanqui; Minería e Inversiones Hércules EIRL. In 2022: Empresa Minera Nueva Otapara SRL; Antonio Echevarria Flores; TRANSDANTE SAC; Cocnepción Rodas Rojas; Coopi Orqo SAC; Minera Cooper Anta Orqo SAC; Socos Nasca SAC.

The extraction contract between the Cobre Pampa miners and the Peru Metal Trading S.A.C. mining company indicates that all extracted minerals must be taken to the facilities of the Peru Metal Trading S.A.C. concentrator plant located in Nasca. If this is not met, they are subject to financial penalties. The contract also indicates that Peru Metal Trading S.A.C. is not responsible for damages to the environment, possible accidents in the mine, such as collapses or asphyxiation due to the release of gases and any other negative situations that could arise from mining activity. Miners in the process of formalization accept all responsibility, and they often have to accept these types of conditions to continue working.

2. 3. 3 Productive process

The exact number of miners working in these spaces could not be determined, but it was estimated to be approximately 60. Some of these miners have an extraction contract and are in the process of formalization. On average, each miner is in charge of between 30 and 35 workers. Thus, there is a mining population of approximately 2,100 workers in the area. Additionally, other miners were observed in the area working in possibly illegal conditions. The latter cannot be quantified due to the strict diligence imposed on them by their legal condition.

In Cobre Pampa, each mining contractor organizes their production between 30 to 35 workers (between 18 and 50 years old) distributed in two work fronts. Work days consist of only one shift, with a timetable of 7 am to 5 pm. The miners state that they do not allow minors to enter the mines. During the fieldwork, we did not see any children in the mining operations. Workers sleep in mine camps for the duration of the monthly campaign, and each miner hires two cooks who provide three meals per day to the workers. The cooks take turns to be head chef and assistant.

According to the Asociación de Mineros de Cobre Pampa (Cobre Pampa Miners' Association), each mining contractor has an estimated production of between 3,000 and 3,500 tons of ore per month, with a head grade that ranges between 1.3% and 1.5% copper. Work safety conditions in mining operations are very limited, although some signage is in the process of being implemented. We observed weak environmental management, since constant fuel spills were seen on the area's surface. There are opportunities for improvement in mining planning to organize mine areas and design other improvement actions, such as strategies for disposing of daily food waste.

It should be noted that, in this sector, women have a dual role in the mining production process. For each contractor, five women are dedicated to shaping and giving the appropriate size to the rocks extracted from the mine. Other women, in small groups of five, are dedicated to selecting the copper ore and separating it from the ore that contains gold. Neither of these two roles can be understood in isolation, and all of these women are considered workers within the production process.

2. 3. 4 Supply chain

According to the type of extraction contract that the miners have in this sector, the ore that they collect is taken to the processing plants indicated by Peru Metal in Nasca. The miners pay transportation for the tons of extracted ore. The first link in the chain is therefore the transporter that the miners use to sell their product, who charges US$8 per ton to take it to the Nasca processing plant. At the plant, the mining contractor pays up to US$30 for the service, in addition to other deductions made by the plant.

The mining contractor is obliged to sell their copper concentrate to Peru Metal; however, delivery of the mineral is not made in Nasca, but in Lima. The miners are therefore forced to make a new transportation payment that may be as high as US$80 per ton of concentrate.

The miner in this area has no other option due to the type of contract they have. The miner does not know the identity of the final buyer or the destination of the product. Miners in the Cobre Pampa Sector have serious grievances about remaining in this contractual relationship with Peru Metal, but state that they do not have many other options in copper mining.

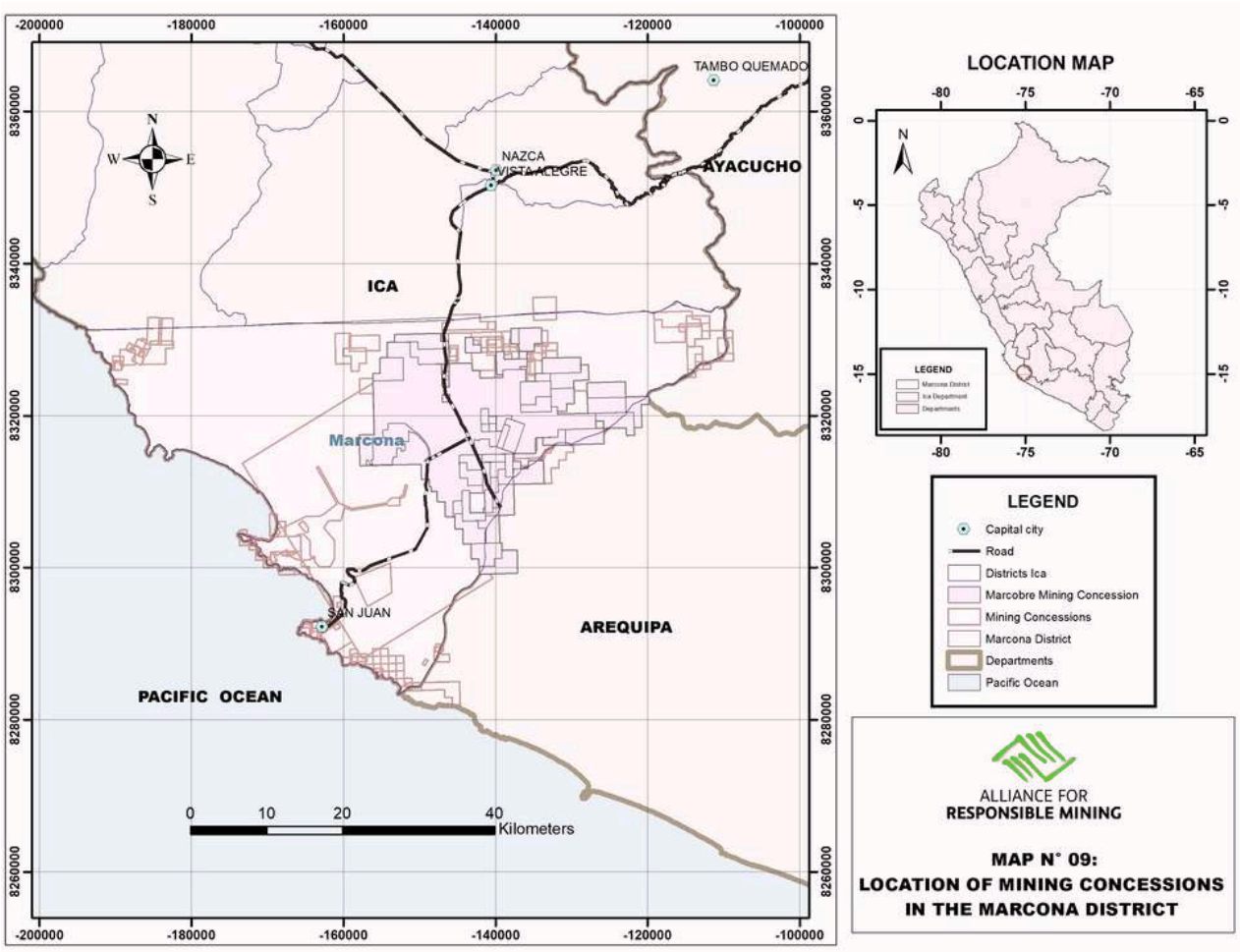
2.4

MARCONDA DISTRICT SECTOR

2.4.1 Location

The San Juan de Marcona Sector is a district in Nasca Province in Ica. The district is known for being home to large-scale mining projects, such as the Marcobre mining company's "Mina Justa". According to INGEMMET's GEOCATMIN tool, they are surrounded by small mining concessions.

These concessions are few, and no conflict situations have been identified. See Map N° 9. An average of 30 miners, both informal and illegal, have been mapped in this area. On average, each miner has 25 to 30 workers; therefore, the total number of miners is approximately 900.



map n.9

2. 4. 2 Legal Status

The vast majority of miners operating in this area are informal. Many have not even entered into a legalized extraction contract, and are working under a verbal agreement with the concession holders. Another group of miners is illegal, which makes it difficult to obtain the exact number dedicated to ASMC mining and estimate production in the area. According to the REINFO, as of January 31, 2024, there were 200 miners registered in this district alone, of whom 26 had a valid registration and 174 had their registration suspended. It should be noted that these miners have no direct relationship with the Marcobre mining company, but many of them operate in its vicinity.

2. 4. 3 Productive process

The research has allowed us to establish certain data regarding the productive process of the ASMC miners in the study area. Each miner has between 25 and 30 workers (between 18 and 55 years old), who are usually divided into two or three work groups, each on a specific work front. We did not observe any child labor, and the contractors are clear that it is prohibited in their operations. Mining operations in this sector are up to five levels deep. The miners also indicated that they usually organize the work day around only one shift, which runs between 7am and 5pm.

Two cooks are also hired to provide food service to the workers, who are given three meals a day. Generally, mining workers sleep in camps provided by the miners for the duration of the campaign.

In this sector, the production of a miner is between 2,500 and 3,000 tons of mineral per month, with an average head grade between 1.6% and 1.8% copper. Safety conditions and environmental management are very precarious, from the absence of signage at different levels of the operation to fuel spills in different areas both on the surface and inside the mine.

We observed some women involved in mining activities, mainly to shape the dimensions of the rocks so that they are of the size requested by the processing plants. Miners in this sector cannot give an exact number of the women involved, because they state that the number depends on the amount of dynamite used.

2. 4. 4 Supply Chain

The stakeholders that appear in the ASMC supply chain for the Marcona Sector are described below. As previously mentioned, this group of miners produces an average of 3,000 tons per month. Firstly, to sell their product, the miner uses a transporter who charges US$5 per ton to take the ore to the processing plants in Nasca.

The stakeholders that appear in the ASMC supply chain for the Marcona Sector are described below. As previously mentioned, this group of miners produces an average of 3,000 tons per month. Firstly, to sell their product, the miner uses a transporter who charges US$5 per ton to take the ore to the processing plants in Nasca. Secondly, the miner must have a relationship with a collector who charges 10% of this raw production to place it in a plant. Thirdly, the miner processes the mineral at the plant for an approximate cost of US$30 per ton for the plant service and other deductions.

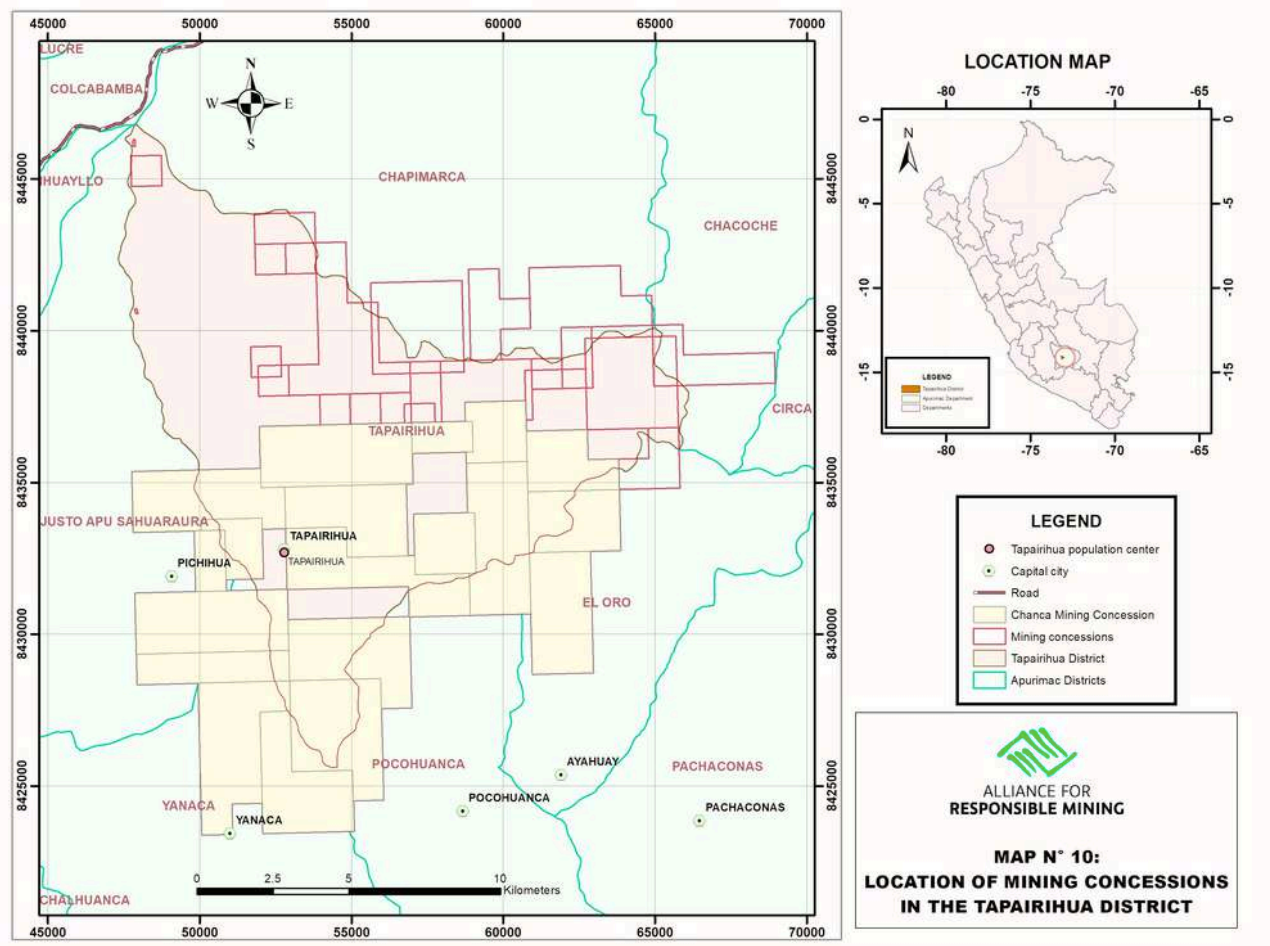
After approximately two or three weeks the miner receives the copper concentrate to sell. In the vast majority of cases, the miner uses an invoicer to sell their product, who charges up to 25% or 30% of the value of the copper concentrate to issue the invoice. The miners do not know the identity of the direct buyer or the destination of their product. The invoicer is key to understanding how the copper concentrate production is commercialized. The miners state that they use the services of the invoicer so that their financial statements do not rise in SUNAT and they can maintain a low profile. However, it is important to note that this stakeholder takes approximately 30% of the value of the copper concentrate.

2.5

TAPAIRIHUA DISTRICT SECTOR

2.5. 1 Location

Tapairihua district is located in Aymaraes province, Apurímac department. The district has a population of 1,848 people (902 women and 946 men). The Los Chancas exploration project of the Southern Copper Corporation mining company is located in this territory, and encompasses the towns of the Pocohuanca and Tapairihua districts, as can be seen on Map N° 10.



map n.10

The Los Chancas project has 19 concessions. It was also possible to identify approximately 30 miners without an extraction contract who practice illegal mining.

2.5. 2 Legal status

The population of Tapairihua and the Los Chancas mining project have a relationship that goes back several years. A YouTube video titled “paro en rechazo al proyecto minero los chancas de la southern-2.wmv” (Strike in rejection of the Los Chancas mining project of Southern-2.wmv), published on April 1, 2010 shows that the conflict has continued for more than 10 years. The local population points out the failure to keep promises, general unrest and opposition to the Los Chancas project.

Ruiz (2021) concludes that this conflict is because of a poor communication strategy. He indicates that 48.1% of respondents consider the conflicts to have arisen due to a lack of information, and 33.3% because of a lack of large-scale investment. Although these are key elements, today the central problem revolves around the fact that the community does not want to lose control of the management of natural resources, which would not occur with the presence of informal miners who are local to the community, or who have its permission.

This situation has become more complex because the local population has begun to illegally exploiting copper in the area of the Los Chancas mining project.

At the end of May 2022, a fire broke out in the Los Chancas mining camp, just 30 days after some residents protested and demanded the withdrawal of the company, stating that they had breached the agreed commitments of non-pollution and employment opportunities for local residents (INFOBAE: 01/06/2022). Southern Copper Corporation filed a criminal complaint and other legal remedies that, as of December 31, 2022, annulled the complaints of 70 illegal miners who had occupied part of its concessions (Cruz: 03/02/2023). Five cases remain open, however. According to the company, part of its concession is still occupied by illegal miners, some of whom are registered in the REINFO. According to the REINFO, there are 168 miners registered in the Tapairihua District, 23 of whom have a valid registration and 145 of whom have had their registration suspended on the platform.

On average, 30 miners work in Tapairihua, and each of them has between 30 and 35 workers. Therefore, the number of workers in the community is approximately 1,050.

It is important to specify that the Tapairihua community member is considered a miner in the community and the outsider only a worker; therefore, the community does not accept outsiders or foreigners as miners. The miner who is a Tapairihua community member only pays 5% of the value of their mineral production to the community. The miners who work in the territory have illegal status.

The complex relationship that the community has with ASMC could have given rise to a conflict over communal boundaries between Tapairihua and the neighboring peasant community of Tiaparo, located just within the concession of the Los Chancas project (ENERGIMINAS, 2022). In its Report No. 236 published in November 2023, the DPP indicates that both communities oppose the mining activity carried out by the Southern Peru Copper Corporation (SPCC). The appropriation of ASMC among the local population has also contributed to both communities resisting giving up control of natural resources. Reuters visited ASMC operations in Tapairihua, and confirmed the presence of illegal miners in more than 20 mines (Diario Gestión: 01/12/2022).

2. 5. 3 Productive process

ach miner employs between 30 and 35 workers on average (between 18 and 60 years old), divided into three work groups, in a single shift that runs from 7am to 5pm.

We did not observe child labor and the miners declare that there are no minors in their operations. Each miner employs two cooks to prepare three meals a day for their workers. Each takes turns either preparing the food or serving the workers.

Three work fronts are usually exploited in the community, which aim to obtain a monthly ore production of between 3,500 and 4,000 tons, with a head grade of 2.5% copper. There is also a presence of copper oxides, but it is not exploited, as well as gold, which is of low grade and, in many cases, discarded by the miners. In Tapairihua, each mining operation can be between four and six levels deep. All mining safety and hygiene and environmental management conditions are very limited and, in some cases, almost non-existent. They use and combine methods of supporting the shafts with solid structures (rooms and pillars, sublevel stoping) and by filling the shafts (cut and fill and long-hole stoping). There is also an accumulation of waste and fuel spills near the mine openings, as there is inside the mine.

For each of the mining operations, we identified a certain number of women – between three and six – dedicated to giving the required dimensions to the rocks with copper ore.

The dimensions are determined by the requests made by the concentrator plants for the ore to enter their facilities. The women also have the task of separating copper rocks from those containing gold. Their priority is to separate only the copper rocks so that they can enter the production process.

Nasca is identified as the main supplier of chemical inputs, machinery and laboratory services to establish the copper grade of the mining operation. Therefore, we infer that the Tapairihua miners establish commercial relationships with laboratories and suppliers of machinery and chemical inputs in Nasca.

South of Peru

2. 5. 4 Supply Chain

ASMC in Tapairihua has provided important data that have allowed us to map the supply chain. This group of miners produces between 3,500 and 4,000 tons of copper ore per month, with a head grade of 2.5% copper. Firstly, the miner uses a transporter to sell their product, who charges US$80 per ton to take it from Tapairihua to the processing plants in Nasca. The miner also has to pay 5% of the value of the mineral production to the community of Tapairihua. Before that, the miner usually connects with a collector, who charges 10% of the value of the mineral production to place it in a plant, with a price that is previously agreed upon.

The miner pays up to US$30 for the plant's services, in addition to other deductions provided by the plant. Thirdly, the invoicer usually charges up to 25% of the value of the copper concentrate for issuing an invoice. The Tapairihua miners do not have up-to-date registration in the REINFO and others are illegal. They therefore require the services of the invoicer to enter their production into the processing plant and sell it as copper concentrate. Some miners declare that they sell the copper concentrate to the same processing plants, and other miners state that they sell it to other sellers in Nasca. Additionally, they do not know the identity of their direct buyer or the destination of their production. The latter is therefore ambiguous data even for the miners.

This group of miners produces between 3,500 and 4,000 tons of copper ore per month, with a head grade of 2.5% copper

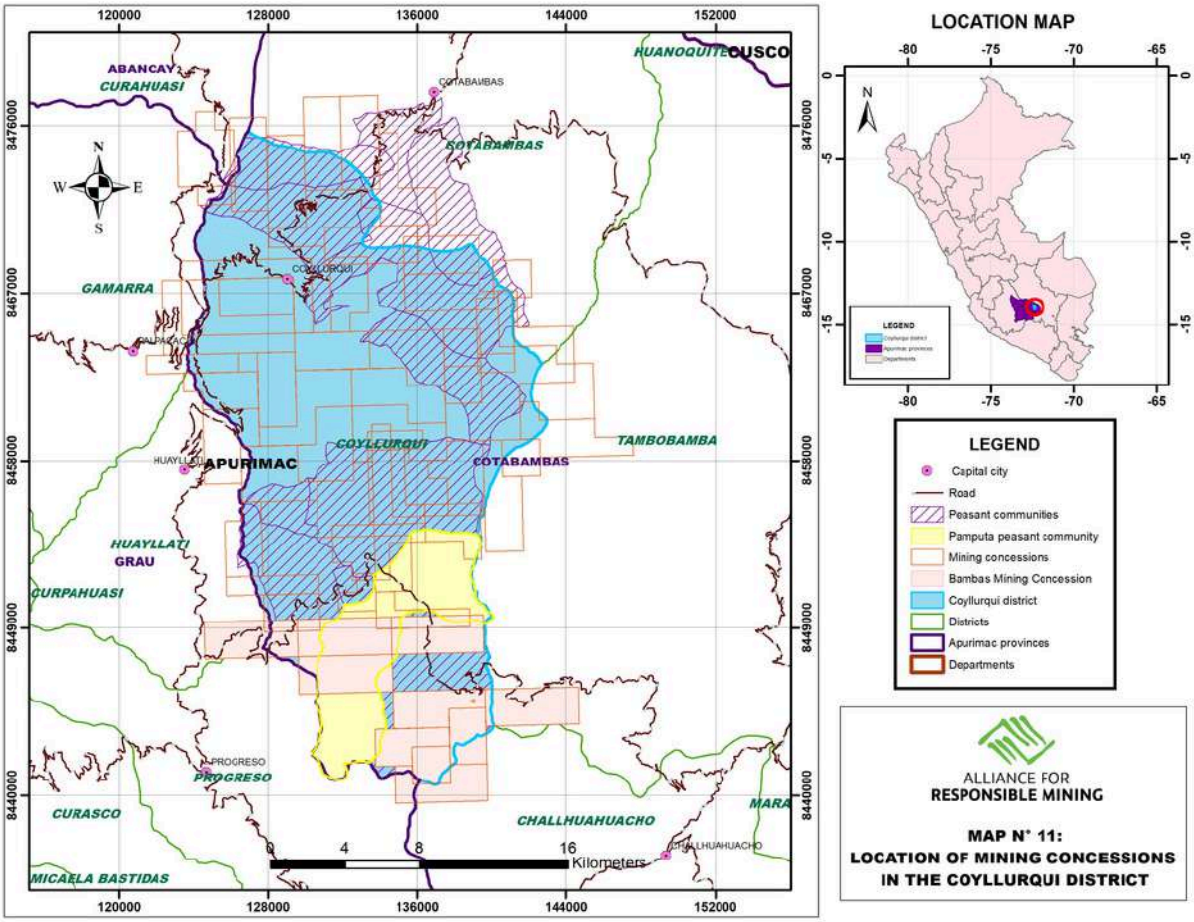
2.6

COYLLURQUI DISTRICT SECTOR

2. 6. 1 Location

The political jurisdiction of the Coyllurqui district is Cotabambas Province in Apurímac Department. The population of the district is 6,546, of whom 3,337 are women and 3,209 are men. The Las Bambas mining project is located in part of the district. See Map N° 11.

We mapped that there are approximately 50 miners in the district without an extraction contract, who only have verbal agreements with the peasant community.



map n.11

2. 6. 2 Legal status

As shown on Map N° 11, Coyllurqui District is home to numerous concessions, mainly those of the Las Bambas S.A. company. Some communities in the district are considered within the area of the project's direct social influence, according to the Tercera Modificación del Estudio de Impacto Ambiental de la Unidad Minera Las Bambas (Third Modification of the Environmental Impact Study of the Las Bambas Mining Unit) (SNC: Lavalin Peru, 2016).

Table N° 11 shows the concessions superimposed on the territory of the peasant community.

Table N° 11: mining concessions in the Coyllurqui District – December 2023

UNIQUE CODE	REPORT DATE	CONCESSION	CONCESSION HOLDER	LEGAL STATUS	PROVINCE	DISTRICT
1995	06/08/2012	Gran Jefe Indio Apache	Alcides Gonzales-Portillo Malpartida	D.M. Certified D.L. 708	Cotabambas	Tambobamba / Coyllurqui
1996	12/08/2010	Bambas 8	Minera Las Bambas S.A.	D.M. Certified D.L. 708	Cotabambas	Coyllurqui
1995	11/08/2008	Mm 707	Vale Exploration Perú S.A.C.	D.M. Certified D.L. 708	Cotabambas	Coyllurqui
1996	01/08/2023	Bambas Norte Rtx 8	Rio Tinto Mining and Exploration S.A.C.	D.M. Certified D.L. 708	Cotabambas	Coyllurqui
1995	12/08/2010	Bambas 9	Minera Las Bambas S.A.	D.M. Certified D.L. 708	Cotabambas	Coyllurqui
1996	12/08/2010	Bambas 15	Minera Las Bambas S.A.	D.M. Certified D.L. 708	Cotabambas/ Grau	Coyllurqui / progreso
1995	12/08/2010	Bambas 18	Minera Las Bambas S.A.	D.M. Certified D.L. 708	Cotabambas	Coyllurqui
1996	27/06/2022	Agustin I	Eduardo Cossio Chirinos	D.M. Certified D.L. 708	Cotabambas	Coyllurqui
1995	01/08/2023	Bambas Norte Rtx 9	Rio Tinto Mining And Exploration S.A.C.	D.M. Certified D.L. 708	Cotabambas	Coyllurqui

Source: GEOCATMIN 7 INGEMMET

Local peasant communities have legal existence with legal status. Their organizational structure is governed by the Law of Peasant Communities N° 24656, the Statute of Peasant Communities and their Internal Regulations. The Las Bambas company has been investing in infrastructure in the communities. For example, in 2023 the company began the construction of the perimeter fence for the "Libertadores de América" Educational Institution, located in the Pamputa community. It should be noted that this work is part of a previous contribution, consisting of the construction of two classrooms implemented with a computer room, digital whiteboards, school furniture, satellite internet, instruments for the musical band, and two education workers.

Even so, ASMC in the Las Bambas project area is characterized by the presence of miners from the same communities, which is why they tend to base their extraction rights on community membership. In the Coyllurqui District there are 432 miners registered in the REINFO, of whom 118 have a valid registration and 314 have had their registration suspended.

There are around 50 miners in this territory, who on average employ between 40 and 50 workers. Therefore, the number of ASMC workers in the district is approximately 2,500.

In this district, only locally recognized active community members are considered miners; outsiders are only considered workers, and are not accepted as miners. They also do not accept outsiders who marry women from peasant communities.

Although some miners are registered in the REINFO, their status is illegal while they do not have agreements with the Las Bambas company. The Las Bambas company does not have a relationship with any ASMC miner. There have also been acts of violence between members of the Las Bambas company and some peasant communities that have not yet been resolved.

2. 6. 3 Productive Process

ASMC is carried out in this community in a basic manner, usually in underground mines where a miner employs between 40 and 50 workers (between 18 and 55 years old), organized in three work groups. They work a single shift from 7am to 5pm. Each miner interviewed for this research maintains that they do not allow child labor, and there was no presence of minors working in the operations. A miner also employs three cooks, who are usually relatives of theirs or a mine worker. These women provide three meals a day for the workers who stay in the mining camps.

Apurimac, Peru

It is important to note that ASMC in this community is developed based on the empirical knowledge that miners have as a result of their experience in formal and informal operations. Their productive process is therefore not very technical; there are no laboratory or other tests that would give them precise data on the profitability of their operations. Given this, three work fronts are exploited, with an approximate monthly production of between 3,500 and 4,000 tons of ore with a head grade of 2.6% copper. This area is characterized by only extracting copper. They use and combine methods to support the excavations with solid structures (rooms and pillars, sublevel stoping) and by filling the shafts (cut and fill and long-hole stoping). They point out, however, that they are not mining specialists, and recognize that it is a constant learning process.

The mining operations observed have not implemented work safety and mining hygiene protocols, or environmental management. Miners have continually suffered work accidents due to collapsed work fronts, in which there have been injuries; however, they keep no records of accidents and incidents.

Women can also be identified in each mining operation. They have the role of sizing the rocks into the dimensions required by the plants. There are groups of three women who have the same work schedule as the other workers. Women are part of the mining project and are paid a similar amount to other workers.

2. 6. 4 Supply Chain

The stakeholders identified within the chain are described below. First is the figure of the transporter, as the miner needs to transport their product to the Nasca plants in order to sell it. The transporter charges US$100 per ton to take it to the processing plant. The miner also has to pay the peasant community 5% of the value of the mineral obtained per campaign. Second is the collector, who charges 10% of the mineral production to place it in a plant. Thirdly, the miner pays the plant up to US$30 for their services.

Finally, the invoicer charges up to 25% or 30% of the value of the copper concentrate to issue the invoice necessary for the mineral to enter the plant and for the miner to sell it. The miners in this territory indicate that the invoicer buys the concentrate directly from them. They also state that they sometimes sell different percentages of their copper concentrate to different plants, depending on the orders they have and the copper head grade that the market is looking for. The miner does not know the final destination of their copper concentrate

Huancavelica, Peru

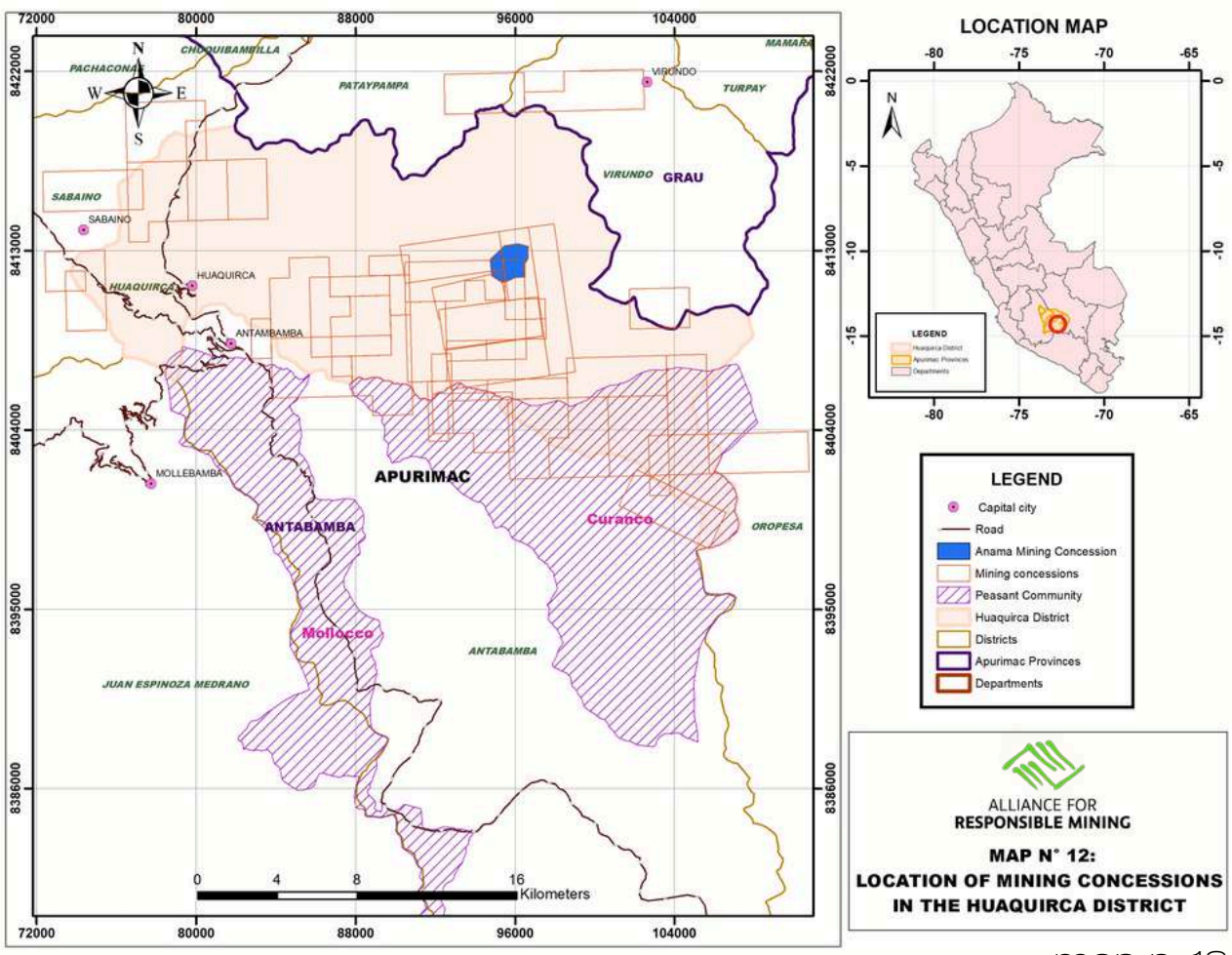
Huaquirca District

2.7

HUAQUIRCA DISTRICT SECTOR

2. 7. 1 Location

Huaquirca District is located in Antabamba Province. The district has an estimated population of 1,173, of whom 53.8% are men and 46.2% are women. Within the area, there are 11 population centers. 85.7% of the population speak Quechua as their native language. There is an education system that offers preschool and primary-level schooling in six educational institutions. The Anama mining project by the Anabi S.A.C. company is located within the district. We were able to identify approximately 30 miners without an exploration contract operating in this area. See Map N° 12.



map n. 12

2. 7. 2 Location

Different mining concessions, including large-scale mining companies and miners in the process of formalization, operate in the district.

The mining concession that has experienced the most problems is the Anama project, a gold processing plant. In August 2015, conflicts arose between the towns of Huaquirca and Sabayno due to the presence of Anama. In November 2016, an indefinite strike was begun by the population of Huaquirca, where “the community members state that the conflict is due to non-compliance with the agreement”, and allege “deception and theft” by the Anabi S.A.C. company. The strike was motivated by the seizure in Cusco of more than 230 kilograms of gold produced by the company, which exceeded the monthly production agreements. A meeting was held on November 17, where agreements were reached (Narváez, 2021). However, in January 2018, the residents of the Huaquirca peasant community began an indefinite strike for the second time, under the same demands.

It should be noted that the presence of informal and illegal miners in the Anama project area produces constant friction both between members of the community and between the communities that are under the influence of the project.

The REINFO shows that there are 92 registered miners in the Huaquirca District, 17 with a valid registration and 75 with a suspended registration.

We identified 30 miners among the population of Huaquirca, who each employ on average 40 to 50 workers, taking the total number to approximately 1,500. In this community, the Huaquirca community member is considered a miner. A foreigner is considered a guest miner. This is, therefore, one of the few cases in which the community tends to accept foreigners as miners. Miners who are active community members pay the value of 5% of their copper ore production to the community, while the guest miners pay 10%. The miners that operate in this territory are informal, and some are registered in the REINFO.

2. 7. 3 Productive process

Each miner employs on average between 40 and 50 workers (between 18 and 60 years old), divided into three work groups, working a single shift between 7am and 5pm.

The miners maintain that they prohibit child labor in their mines, and we observed no presence of minors in mining activity during the field visit. Each miner employs three cooks to prepare three meals a day for their workers. The workers sleep in camps provided by the miner.

In this community, each miner usually exploits three work fronts in order to obtain a monthly production of between 3,000 and 3,500 tons of ore, with a head grade of 2.2% copper. These miners also extract gold, although in small quantities; they prefer to extract copper due to the high demand they perceive. In Huaquirca, each mining operation can be between two and five levels deep. All mining safety and hygiene conditions and environmental management are scarce and almost non-existent.

They use and combine methods to support the excavations with solid structures (rooms and pillars, sublevel stoping) and by filling the shafts (cut and fill and long-hole stoping). We observed fuel spills and the accumulation of waste in the area around the operations, both on the surface and inside the mine. Furthermore, there is no ventilation planning.

For each of the mining operations, we identified between five and seven women dedicated to giving the required dimensions to the rocks with copper ore. Women also have the task of separating the rocks with gold and copper ore. The dimensions of the rocks depend on the plant and vary greatly according to the capacity of the crusher.

2. 7. 4 Supply chain

As established above, a miner can produce between 3,000 and 3,500 tons of copper ore per month. The miners in this territory are responsible for transporting the ore from the mine to Nasca in order to process and sell it. The transportation of copper ore costs US$90 per ton. We observed that the miners establish links with a collector, who charges them 10% of the mineral production to place it in a processing plant. This relationship is highly value by the miner. The collector is responsible for finding an available plant and organizing with them so that preference is given to the miner. The processing could take between three and four weeks, in the best of cases.

The miner pays up to US$30 per ton for the plant's services, in addition to other deductions made by the plant. At this point, the invoicer charges between 25% or 30% of the value of the copper concentrate to issue the invoice. As seen in previous cases, the miners state that they take their ore to the plants in Nasca, where they sell their copper concentrate to the same plants or other buyers. In the same way, they do not know the identity of their final buyer or the destination of their product.

As seen in previous cases, the miners state that they take their ore to the plants in Nasca, where they sell their copper concentrate to the same plants or other buyers. In the same way, they do not know the identity of their final buyer or the destination of their product.

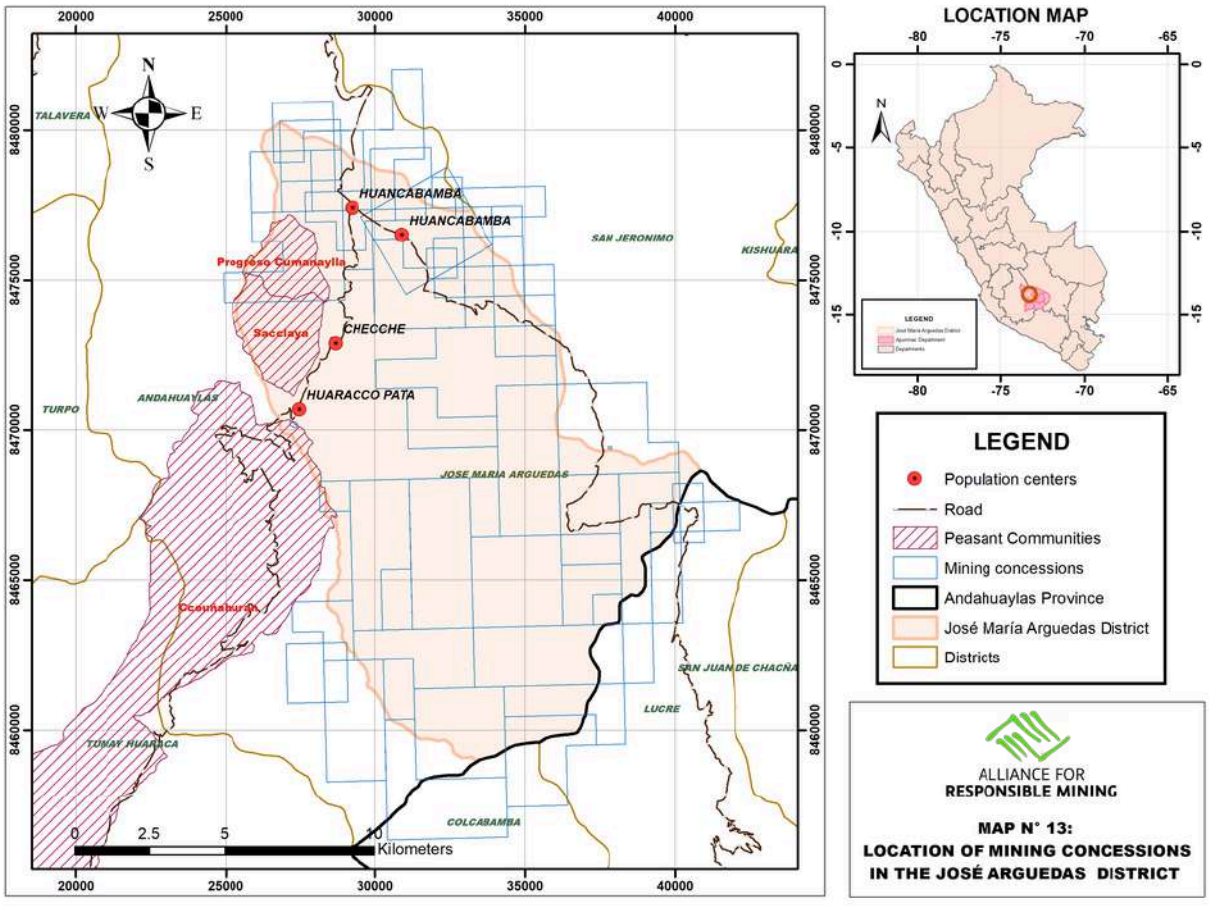
2.8

HUANCABAMBA- CHECCHE- HUARACOPATA SECTOR

2.8.1 Location

These three population centers are located in the José María Arguedas District, Andahuaylas Province, Apurímac Region. They have been organized to face the problem of mining since 2007, when they formed the Huancabamba- Checche- Huaracopata communal company. At first, these communities attempted to take a stand against mining; however, over the years, they decided to organize and set rules for the different miners who work in their territory. See Map N° 13.

We identified approximately 200 miners, some of them informal and registered in the REINFO and others illegal, but all with authorization from the communal company to work in their territories.



map n. 13

2. 8. 2 Legal status

The Huancabamba- Checche-Huaracopata communal company has established regulations for miners as a result of the constant clashes that were taking place between farmers and ASMG and ASMC miners. These regulations were developed independent of any specific Peruvian legislation that would have covered them. Since 2007, community members who are dedicated to mining have come into direct conflict with other community members who are dedicated to agricultural activities. This has clearly marked a rupture in communal space, where acts of violence have occurred. According to Puga Quispe and Tito Vega (2019), the emergence of mining activity has generated a crisis and weakening of community organization. This is because of an absence of regulations that could organize the territory. Each party accuses the other, so it has not been possible to reach an agreement. Since 2011, the three population centers have started to organize and coexist with mining activity.

In 2022, a violent incident occurred that led to the formation of a new communal company in Huancabamba. On March 22 of that year, a meeting was called in the Plaza de Huancabamba, which was also attended by the residents of Checche and Huaraccopata, to discuss the problem of informal mining, as well as the temporary suspension of all types of extractive activities in the area, including the transportation of minerals.

According to what we were told, although the miners were notified to temporarily suspend their activities, they ignored the suspension and threatened to file criminal charges against the community leaders, in open contempt of the decisions made by the population. They also agreed to annul the registration of 22 miners in the REINFO from the area for generating social, environmental and security problems, in addition to cancelling the social license of the Asociación de Mineros Artesanales de Huinchoccota (Huinchoccota Artisanal Miners' Association). In the end, they agreed to reactivate the registrations that had been suspended in the REINFO and restart extractive activities in Huinchoccota under the administration of a communal company made up of a board of directors and partners (Nicanor, March 23, 2022).

To date, **data from the REINFO indicates that there are 38 miners registered, nine of whom have a valid registration and 29 of whom have had their registration suspended.**

The formation of communal mining companies is becoming an alternative for the community to be able to effectively manage and control the presence of miners in their territories. ASMC is not always well received by all members of the community, which is why defense fronts are generally formed, as in this case.

Nevertheless, we see how the formation of the communal company provides some level of local security to ASMC. This communal company identifies 200 miners, who each employ between 25 and 35 workers, meaning that there are approximately 6,000 workers in these territories. It should be specified that the community member is considered a miner, while the foreigner is considered a guest miner. The miner who is a community member pays 5% of the value of the mineral to the communal company, while the guest miner pays 10% of the value of the mineral to the communal company. Some of these miners are informal workers registered in the REINFO.

2. 8. 3 Productive process

Each miner employs on average between 25 and 30 workers (between 22 and 60 years old), divided into two or three work groups, in a single shift that runs from 7am to 5pm. The Huancabamba- Checche-Huaracopata communal company restricts the entry of minors into the mine, and its regulations do not allow child labor. **No child labor was observed during fieldwork in the two mining operations visited.**

Each miner employs three cooks to prepare the daily meals for their workers. All of the miners live in camps established by the owner of the mining operation during the work campaign period. Each miner usually exploits three work fronts in order to obtain a monthly production of between 2,000 and 2,500 tons of ore, with a head grade of 3.1% copper.

These miners also extract gold on a monthly basis; however, they state that their work gives priority to copper extraction.

In these communities, each mining operation can be between two and four levels deep. **All mining safety and hygiene and environmental management conditions are very limited and, in some cases, almost non-existent.** They use and combine methods to support the excavations with solid structures (rooms and pillars, sublevel stoping) and by filling the shafts (cut and fill and long-hole stoping). In addition, we observed food waste scattered throughout the mining camps and inside the mine. We also observed fuel spills on the surface and inside the mine.

For each of the mining operations, we identified between four and six women dedicated to giving the required dimensions to the rocks with copper ore. The dimensions are determined by the requests made by the processing plants, so that the ore can enter their facilities. **We also observed women carrying out the work of separating the minerals that contain gold and those that contain copper.**

2. 8. 4 Supply chain

At the end of a monthly campaign, the miners accumulate between 2,000 and 2,500 tons of ore with a head grade of 3.1% copper. To process their product, the miners use a transporter who charges approximately US$90 per ton to take it to the processing plants in Nasca. It is also vitally important that the miners establish good ties with a collector, who charges them 10% of their raw production to organize space in a concentrator plant. The miners pay up to US$30 per ton for the concentrator plant service.

The invoicer then charges the miners up to 25% or 30% of the value of the copper concentrate to issue an invoice. The miners from this community state that, in many cases, they sell their copper concentrate to the same plants in Nasca or to other buyers in the city. The miners are not usually interested in who buys it or where they take it; therefore, they do not know the identity of the direct buyer, much less the destination of their product.

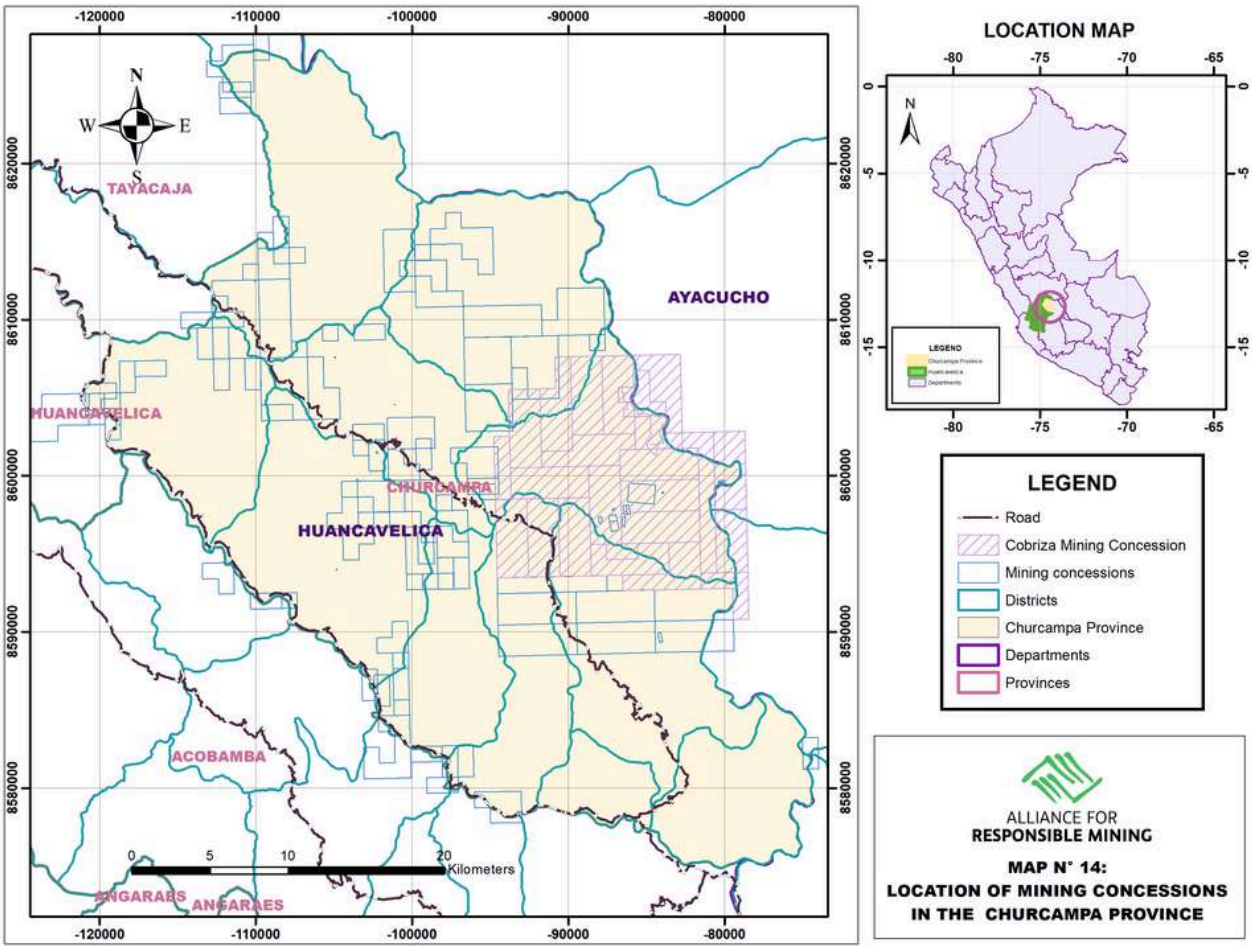
Huancabamba

2.9

CHURCAMPA PROVINCE SECTOR

2. 9. 1 Location

Churcampa Province is located in Huancavelica Department. One hundred informal and illegal miners have been mapped in this area, each of whom employs between 35 and 40 workers on average, meaning the total number of workers is approximately 4,000. In the sector, only local workers are considered miners, while outsiders are called mining workers. See Map N° 14.

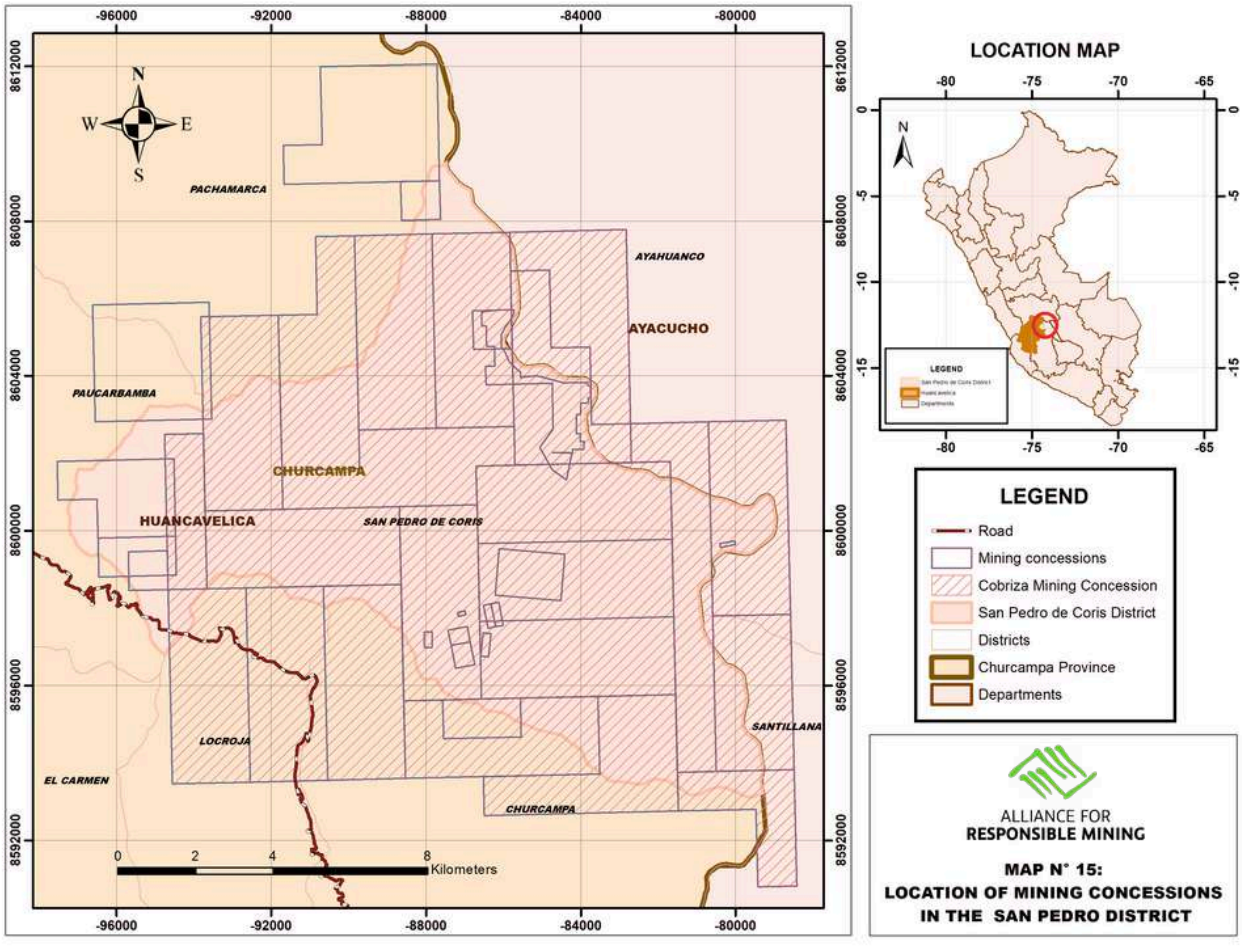


map n.14

The “Cobriza” mine is located in the San Pedro de Coris District. It was discovered in 1952 by the Cerro de Pasco Minan Corporation. Between 1974 and 1998, the mine was under the management of Centromin Peru. From then until 2014, the mine was owned by Doe Run Peru, and then by liquidation companies. In 2022, a new stage was opened when the mine was awarded to Operadores Concentrados Peruanos (OCP).

The concessions in the name of OCP occupy almost the entire district of San Pedro de Coris, as indicated on Map N° 15.

The communities of San Pedro de Coris have not presented opposition to the Cobriza mining operation; on the contrary, they have always pressed for its sale to be effective and for mining operations to restart, so that they can benefit from the dividends that correspond to them. Thus, in January 2023, OCP acquired the mining operation and, since that date, there has not been any conflict with the communities or their authorities. This has not prevented there from being some incursions by illegal miners in their concession areas. See Map N° 15.



Map n.15

2. 9. 2 Legal status

Both engineers from the DREM in Huancavelica and the president of the Federación de Mineros Artesanales (Artisanal Miners Federation) emphasized that both informal and illegal ASMC takes place in Churcampa Province, and members of local communities participate. This usually takes place around OCP's Cobriza mine, which often generates complaints from the mining company. OCP has no connection with ASMC miners.

There are 279 miners registered in the REINFO in Churcampa Province, 50 of whom have a valid registration and 229 of whom have had their registration suspended. In the case of the San Pedro de Coris District, 146 miners have registered in the REINFO. Only 30 have a valid registration and 116 have had their registration suspended.

2. 9. 3 Productive process

Each of the ASMC miners in this area have an average of 35 to 40 workers (between 18 and 55 years old). We also identified women as operation owners. The miners of the province state that no child labor takes place, and we did not observe minors working in the mines.

The miners are divided into three work groups, and work a single shift that generally begins at 7am and ends at approximately 5pm. The miners employ three cooks who prepare three meals a day for the workers of the mining operation.

Each miner usually exploits three work fronts, in order to obtain a monthly mineral production of between 3,000 and 3,500 tons, with a head grade of 2.9% copper. The mining operations are dedicated exclusively to copper, although they recognize that sometimes they find gold. In these communities, each mining operation can be between two and four levels deep. Mining safety and hygiene conditions and environmental management are poorly implemented. In some cases, they are well indicated. They use and combine methods to support the excavations with solid structures (rooms and pillars, sublevel stoping) and by filling the shafts (cut and fill and long-hole stoping). We also observed solid waste management and, in some mining operations, small plant nurseries.

For each of the mining operations, we identified between seven and nine women dedicated to giving the required size to the rocks with copper ore. The dimensions are determined by the requests made by the processing plants, so that the mineral can enter their facilities.

2. 9. 4 Supply chain

These groups of miners produce between 3,000 and 3,500 tons of raw ore with a head grade of 2.9% copper. To transport the ore, the miners use a transporter who takes it from San Pedro de Coris to Pisco. The miner pays the transporter US$90 per ton to transport it to the Pisco or Paracas processing plants. The miner must also have contact with a collector, who charges 10% of the raw product to place it in a plant and process it. The collector looks for a plant with a good price that is available to receive the ore.

At the processing plant, the miner pays up to US$30 per ton for its services, in addition to other deductions it makes. To commercialize their copper concentrate, the miner also needs an invoicer, who charges between 25% and 30% of the value of the copper concentrate to issue an invoice.

The miners confirmed that they take their ore to the plants in Pisco and Paracas, and that the copper concentrate is sold to the same plants or other buyers in Pisco. On the other hand, they stated that they did not know the identity of their direct buyer or the destination of their product.

The miner must also have contact with a collector, who charges 10% of the raw product to place it in a plant and process it. The collector looks for a plant with a good price that is available to receive the ore.

III. INTERPRETATION OF RESULTS

Four aspects that emerge from the nine case studies presented in the research results are useful to highlight: i) environmental impacts of sulfide extraction; ii) characteristics of "the spirits" of ASMC supply chains; iii) rural transformations as a result of ASMC; and iv) limitations of the ASM legal framework to instruct ASMC.

1.

ENVIRONMENTAL IMPACTS OF SULFIDE EXTRACTION BY ASMC

ASMC miners extract copper sulfide in underground mining because of its high head grades and minerology, which facilitate its processing in concentrator plants using flotation systems. The characteristics of the copper sulfide extraction process and the environmental impacts produced by this activity are described below.

Copper is obtained from sulfide minerals (80%) and oxidized minerals (20%). The former are treated by a process called pyrometallurgy, and the latter by a process called hydrometallurgy. These are terms that very few miners know, but they are clear that the copper sulfides make them profits. Theoretically, oxidized copper minerals originate from the decomposition and oxidation of sulfide minerals. They are found on the surface of the mine and, due to the great investment needed, are exploited by large-scale mining operations. They also serve as an indicator of the presence of copper.

Copper is normally found alongside sulfur in nature. Pure copper metal is usually produced over several stages, beginning with extraction in underground mines, where the head grade of the ore is estimated. The underground extraction method is used when the mineralized areas are narrow and deep. This justifies the drilling of tunnels and shafts to enable extraction, without having to move the material that covers the deposit. In an underground mine, ore is extracted from the bottom up, using the force of gravity to fragment and move it towards loading points.

Three main techniques can be distinguished in underground mining: i) supporting the open space with solid structures (room and pillar, sublevel stoping, vertical crater retreat); ii) filling or strengthening the open space (ascending or descending cut and fill, shrinkage stoping, shoring, long-hole stoping); and iii) controlled caving of the open space (sublevel caving, block caving).

After extraction, the ore is transported to the processing or concentrator plants. It then arrives at the smelting and refining stage, where the pyrometallurgical or hydrometallurgical process is applied, according to the mineralized material. ASMC miners only participate up to the concentration process, like most medium- and large-scale companies in Peru. The miners tend to lose track of their concentrate production, as most smelting and refining plants are located abroad (mostly in Asia). They are therefore unaware of the process that converts their product into high-purity copper for the industrial demand of the international market. ASMC miners do not participate in the smelting process, since their general objective is to commercialize the copper concentrate. They know little of the rest of the value chain, and in most cases do not even know the identity of their buyer.

The environmental impacts of ASMC have not been the subject of a more in-depth study, but some elements observed in the nine case studies presented in the research results can be determined.

- Generally, the exploration process does not produce major environmental impacts, as miners rely on observation to determine the location of the mineral, and they collect samples from the surface.

- Underground extraction is carried out by building a network of horizontal and vertical tunnels to extract the ore. The construction of tunnels weakens the geological structure of the terrain, which can collapse if not well supported, causing accidents or deaths of workers.

- Shots (detonations) are carried out in the tunnels to remove the ore. Toxic gases and mineralized particles do not make their way to the surface, because the environments are closed and have no ventilation planning. The exposure of workers is therefore a more severe issue, and can produce a disease called pneumoconiosis. As we observed during visits to ASMC mining units, there is also a lack of specialized protective equipment. Miners are directly exposed to types of agents that are toxic for their health.

The lack of adequate ventilation in the shafts was apparent from the second level of the mining units, although the workers stated that they did not feel anything.

- In many cases, water was found in excavations for shaft mining, resulting in a high degree of humidity inside the mine. This water is generally very acidic, with a high content of dissolved metals such as iron, lead, zinc and copper. These waters are drained outside without any type of treatment. They then circulate until reaching nearby rivers, streams and other water sources, directly affecting the populations and fauna that use them for consumption.

- We observed spills due to fuel use in different areas of the mining operation (mine surface and interior). Although these spills are in very small quantities, they remain a source of contamination. Gasoline, for example, evaporates at room temperature and can cause health problems if there is constant exposure.

- In the ASMC mining operations visited, we observed how wastewater is discharged onto the ground without any care. The miners who are familiar with gold operations claim that, since the water from copper operations does not contain mercury, it is not as harmful to their health.

- The garbage and waste that accumulates near mining operations, such as plastics and organic waste, attracts insects and rodents. For this reason, stomach illnesses are common among workers.

- The ore extracted from the mine is taken to processing plants in order to obtain copper concentrate. For this, it must be crushed and ground, and then passed through flotation cells. It is understood that every physical-chemical transformation process produces waste, which could be considered a source of pollution. The crushing and grinding process, for example, produces dust that, together with the strong winds that occur in Nasca, generates strong pollution that affects the nearby population. In 2015, the Agency for Environmental Assessment and Enforcement (OEFA) produced an environmental monitoring report regarding concentrations of particulate matter less than 2.5 microns (PM-2.5). The values obtained did not comply with the environmental quality standards (EQS) for air established in SP N° 003-2008-MINAM. The report assumes that the high PM-2.5 values are probably due to causes such as combustion generated by vehicles. On the other hand, the report states that in the case of the CA-TRA-01 and CA-TRA-03 measurement stations, the main causes are the crushing and grinding operations in ASM concentrator plants, which are located south of the above-mentioned stations (OEFA, 2015).

- Transportation has not been identified as a predominant source of contamination in this process. However, within the ASMC supply chain, transportation is very intensive. It generates significant noise and air (carbon emissions) pollution, and a heavy impact on the land.

- The cleaning of trucks contaminates nearby waters, as it discharges mineral particles and chemical substances into the water channels. During the field visit, we observed that the drains from the laundry services flow into nearby ditches, which then flow into the rivers. In other cases, truck washes are located near rivers, generating constant exposure for the waters of nearby basins.

To recapitulate, the extraction of underground ASMC mainly tends to impact the health of workers and surrounding populations. This is due to various factors, such as direct exposure to dust, gases and precarious operating conditions. Furthermore, we identified that operating conditions affect the environment, due to inadequate environmental management.

2.

CHARACTERISTICS OF “THE SPIRITS” OF ASMC SUPPLY CHAINS

In order to explain the supply chain, we developed a typology for three cases based on the results of this research: Ica, Apurímac and Huancavelica. This typology has been constructed based on the average ore head grade of each of the three regions, the most recurring operating expenses and the average international copper price for 2023.

The typology for Ica considers a company in the process of formalization. It is registered in the REINFO and is made up of four partners and 35 workers. It has a gross expenditure of almost US$194,470 for a 30-day campaign, considering that it extracts 3,000 tons of ore with a head grade of 1.5% copper. Of these gross expenses, 47% is allocated to the processing plant and 16.5% to pay the company’s workers. Additionally, 13% is spent on transportation, 7.5% on dynamite, 1.6% is paid to the collector and 1.6% to the local community.

Key aspects to highlight among these operating costs are the role of the collector and the high percentage invested in the services of the processing plant. The collector is the individual who has an agreement with the processing plant to transport the ore. It can then take four to five weeks for the ore taken to the processing plant to be processed and the product delivered to the miner.

The collector collects their percentage of the payment once the miner has liquidity from the sale of the copper concentrate.

For a head grade of 1.5% copper, only 90% is recovered for the sale of copper concentrate, a value of 13.5 kilograms per ton. Taking into account a loss of 4% in other minerals, this results in a value of 12.96 kilograms, or a recovery of 85.4%. In this sense, the monetary value would be approximately US$294,115.58. During the process, the miner usually requires the services of an invoicer to provide proof of payment for the sale of the product. The invoicer charges the miner 25% to 30% of the value of the copper concentrate. To the ASMC miner, the invoicer is referred to as a "spirit," an enigmatic figure who has the capacity to influence their operations, either positively or negatively.

To the ASMC miner, the invoicer is like a “spirit”, a character with a fantastical narrative who suddenly appears in their world and has the capacity to do good or evil.

Road to Arequipa, Perú

Considering the operating expenses, the payment to the invoicer and the income from the sale of the mineral, the company – made up of four partners – has a monthly profit of approximately US$30,116.69. In this typology, we did not consider cases such as Cobre Pampa, where operating costs constantly rise due to transporting the ore to Lima.

In the interviews held with different miners to develop Table N° 12, they were of the opinion that the profit is very little for the risks that they assume, as there may be deaths, which clearly cannot be quantified in the table. They also state that it is necessary to calculate the gifts that they are obliged to make, in order to avoid problems with inspections on the roads, as part of the informal system to which they are constantly exposed.

Table N° 12: Model of expenses of a 30-day ASMC campaign in Ica - January 2024*

INPUT	UNIT OF MEASUREMENT	N° UNITS USED	COST PER UNIT USD	SERVICE LIFE (MONTH)	MONTHLY COST USD
General Manager / Accounting	Monthly	1	1,700.00	1	1,700.00
Office rental / Internet	Monthly	1	500.00	1	500.00
Administrative expenses	Formalization / relationship	1	2,000.00	1	2,000.00
Diesel and Electric Mini Dumper	Engine (1.5) and capacity 2.5 Tn	4	6,000.00	4	6,000.00
Diesel 4500 Generator	UBERMAN energy generator	2	1,750.00	4	875.00
Oxygen compressor	30-550HP Air compressor	2	2,500.00	4	1,250.00
Basic mining carts	Capacity 1 Tn.	10	600.00	4	1,500.00
Breathing masks / headsets	Industrial for mining	35	50.00	12	145.83
Ventilators	For underground mining	3	1,000.00	12	250.00
Winch	Drag footage	4	2000.00	6	1,333.00
Safety clothing	Industrial for mining	35	40.00	12	116.67
Waterproof boots	Industrial for mining	35	30.00	12	87.50
Mining boots	Industrial for mining	35	40.00	12	116.67
Helmets	Industrial for mining	35	14.00	12	40.83
Lamps	Industrial for mining	35	16.00	12	46.67
Pneumatic drilling machine	Complete units with equipment	5	2,500.00	6	2,083.33
Picks	Industrial for mining	35	5.00	12	14.58
Torches	Industrial for mining	35	5.00	12	14.58
Mining sacks	Hundreds	10	14.00	1	140.00
Mats	Dozens	100	4.00	1	400.00
Timber battens	Dozens	100	5.00	1	500.00
Famesa Semigelatina Dynamite	Box of 25 Kg / 45 and 80	35	405.00	1	14,175.00
Petroleum	Gallons	200	6.00	1	1,200.00
Gasoline	Gallons	100	3.50	1	350.00

Table N° 12: Model of expenses of a 30-day ASMC campaign in Ica - January 2024*

INPUT	UNIT OF MEASUREMENT	N° UNITS USED	COST PER UNIT USD	SERVICE LIFE (MONTH)	MONTHLY COST USD
Water	Cisterns	4	20.00	1	80.00
Food	Per person/day	35	10.00	1	350.00
Chef	Monthly	2	350.00	1	700.00
Worker	Monthly	35	900.00	1	31,500.00
Transport / dump truck	3,000 Tons*	3000	8.00	1	24,000.00
Community payment	10 % of raw mineral cost	1	3,000.00	1	3,000.00
Collector	10 % of raw mineral cost	1	3,000.00	1	3,000.00
Other inputs (mechanical workshops, welders, wicks, injuries)	10 % of raw mineral cost	1	3,000.00	1	3,000.00
Concentrator plant service	USD 30 per Tn. (1.5 head grade)	3000	30.00	1	90,000.00
TOTAL GROSS EXPENSES	USD				190,470.00
Concentrator plant service	90% recovery (13.5kgxTn) + 4% loss (0.54) =12.96 kg/85.4%	1	294,115.58	1	294,115.58
Invoicer	25% of mineral concentrate	1	73,528.89	1	73,528.89
NET INCOME	USD				30,116.69

*The campaign model lasts 30 days. It is a common ASMC company model of four partners and 35 workers. The company is formal and registered in the REINFO. All purchases are made in the informal market in Nasca. The exchange rate from USD to Nuevos Soles is 1:3.7. The costing exercise has a production of 3,000 Tn with a head grade of 1.5% copper, during January 2024.

**Sale of raw mineral USD 10 per Tn. In this model, 3,000 Tn were produced with a value of USD 30,000. International copper value CVSUSDxLb=399 / 1kg=2.2046 Lb

***The value calculation was based on 12.96 kg x Tn / 1Tn= 12.96 Kg or 28.573 Lb x Tn / 3000 Tn = 85.715*3.99[Lb] = 294,115.58 USD

In the case of Apurímac, the ASMC supply chain situation is more complex, because peasant communities are involved and the transportation costs are much higher. We used the same methodology, but with a company of eight partners and the highest copper head grade value. According to what was observed in the fieldwork, and stated by the miners, the head grade is higher than in Nasca. This means that the balance of income and expenses is more favorable here. Even the collectors and invoicers have greater interests in Apurímac than in Ica, and are always looking for high-grade ore.

For this case, we designed a basic typology, with a head grade of 2.5% copper and a 30-day campaign with 35 workers, which resulted in 3,500 tons of extracted ore. The total operating costs were almost US$468,220, in which the highest segment was the 60% spent on transportation from the communities where the mines are located to the plants in Nasca.

22.5% of the total operating costs are allocated to payments for the processing plants and 7% to payments for the 35 workers of the mining operation. It is important to emphasize that approximately 1.1% of the operating costs are paid to the collector to organize space in a processing plant. 1.1% is also paid to the local community as a royalty. The most expensive input in the expenses and income costs table is dynamite, which represents 3% of the costs.

For the copper concentrate sales exercise, we proposed a recovery of 90% and losses of 4%, giving a value of 21.6 kg / 85.4%. The monetary value would therefore be US$664,999.34. The invoicer charges between 25% and 30% to provide an invoice for the sale of the copper concentrate. Discounting the sales value, the payment to the invoicer and the operation cost, the profit of the company – made up of eight people – would be US$30,529.50.

"A 30-day campaign with 35 workers, which resulted in 3,500 tons of extracted ore. The total operating costs were almost US$468,220, in which the highest segment was the 60% spent on transportation from the communities where the mines are located to the plants in Nasca."

In the interviews with the Apurímac miners to develop Table N° 13, they stated that the main limitation they have is the payments they make in transportation, which alone represent 60% of their costs. This is assuming that they sell their copper concentrate in Nasca; if they have to take their copper concentrate to other areas, their transportation costs rise greatly. Among the main needs of the Apurímac miners would be to have a processing plant in Abancay, Ayamaraes or Cotabambas; however, they themselves accept that this is a distant dream. They also state that the investment they make is very high-risk, because it is money that they do not have to hand; they must, therefore, turn to lenders. Furthermore, when they finish production, there is a wait of almost a month between when the ore enters the plant and when it leaves as a concentrate.

This time is also critical for them, because they must wait for their product and have good contacts in order to reach the buyer.

In conclusion, for the miners, the figures of the transporter and the invoicer are like “spirits” who are essential to their world. No miner complains about the 25% or 30% that the invoicer charges for the sale of copper concentrate, or the 60% (+/-) that the transporter charges. The miners state that they do not want to appear before SUNAT, and have no qualms about paying either of these figures.
The refusal of their companies to declare high sales is one of the main reasons, but it is typical of the distrust they have in the State and its institutions. It would seem that informality earns more, but this is not the case.

Table N° 13: Model of expenses of a 30-day ASMC campaign in Apurímac - January 2024*

INPUT	UNIT OF MEASUREMENT	# UNITS USED	COST X UNITS USD	SERVICE LIFE (MONTHS)	MONTHLY COST USD
General Manager / Accounting	Monthly	1	1,700.00	1	1,700.00
Office rental / Internet	Monthly	1	500.00	1	500.00
Administrative expenses	Formalization / relationship	1	2,000.00	1	2,000.00
Diesel and Electric Mini Dumper	Engine (1.5) and capacity 2.5 Tn	4	6,000.00	4	6,000.00
Diesel 4500 Generator	UBERMAN energy generator	2	1,750.00	4	875.00
Oxygen compressor	30-550HP Air compressor	2	2,500.00	4	1,250.00
Basic mining carts	Capacity 1 Tn.	10	600.00	4	1,500.00
Breathing masks / headsets	Industrial for mining	35	50.00	12	145.83
Ventilators	For underground mining	3	1,000.00	12	250.00
Winch	Drag footage	4	2000.00	6	1,333.00
Safety clothing	Industrial for mining	35	40.00	12	116.67
Waterproof boots	Industrial for mining	35	30.00	12	87.50
Mining boots	Industrial for mining	35	40.00	12	116.67
Helmets	Industrial for mining	35	14.00	12	40.83
Lamps	Industrial for mining	35	16.00	12	46.67
Pneumatic drilling machine	Complete units with equipment	5	2,500.00	6	2,083.33
Picks	Industrial for mining	35	5.00	12	14.58
Torches	Industrial for mining	35	5.00	12	14.58
Mining sacks	Hundreds	10	14.00	1	140.00
Mats	Dozens	100	4.00	1	400.00
Timber battens	Dozens	100	5.00	1	500.00
Famesa Semigelatina Dynamite	Box of 25 Kg / 45 and 80	35	405.00	1	14,175.00
Petroleum	Gallons	200	6.00	1	1,200.00
Gasoline	Gallons	100	3.50	1	350.00

Table N° 13: Model of expenses of a 30-day ASMC campaign in Apurímac - January 2024*

INPUT	UNIT OF MEASUREMENT	N° UNITS USED	COST PER UNIT USD	SERVICE LIFE (MONTH)	MONTHLY COST USD
Water	Cisterns	4	20.00	1	80.00
Food	Per person/day	35	10.00	1	350.00
Chef	Monthly	2	350.00	1	700.00
Worker	Monthly	35	900.00	1	31,500.00
Transport / dump truck	3,000 Tons*	3,500	80.00	1	280,000.00
Community payment	10 % of raw mineral cost	1	5,250.00	1	5,250.00
Collector	10 % of raw mineral cost	1	5,250.00	1	5,250.00
Other inputs (mechanical workshops, welders, wicks, injuries)	10 % of raw mineral cost	1	5,250.00	1	5,250.00
Concentrator plant service	USD 30 per Tn. (1.5 head grade)	3,500	30.00	1	105,000.00
TOTAL GROSS EXPENSES	USD				468,220.00
Concentrator plant service	90% recovery (13.5kgxTn) + 4% loss (0.54) =12.96 kg/85.4%	1	294,115.58	1	664,999.34
Invoicer	25% of mineral concentrate	1	73,528.89	1	166,249.84
NET INCOME	USD				30,529.50

* The campaign model lasts 30 days. It is a common ASMC company model of eight partners and 35 workers. The company is formal and registered in the REINFO. All purchases are made in the informal markets in Chalhuanca and Chalhuahuacho. The exchange rate from USD to Nuevos Soles is 1:3.7. The costing exercise has a production of 3,500 Tn with a head grade of 2.5% copper during January 2024.

** Sale of raw mineral USD 15 per Tn. In this model, 3,500 Tn were produced with a value of USD 52,500. International copper value CVSUSDxLb=399 / 1kg=2.2046 Lb.

*** The value calculation was based on 21.6 kg x Tn / 1Tn= 21.6 Kg or 47.619 Lb x Tn / 3500 Tn = 166,666.50*3.99[Lb] = 664,999.335 USD

In the case of Huancavelica, we designed a basic standard model. Copper extraction is mainly carried out in Churcampa Province. According to participant observation and interviews with local miners, copper has better head grades than in Apurímac and Ica, reaching an average ore grade of 2.8%. This case describes a company with eight partners and 35 workers that is in the process of formalization and registered in the REINFO.

Operating costs reach a total of US$ 440,970. The highest expenses are the 61% dedicated to the transportation of ore from Churcampa to Pisco or Nasca. This percentage is slightly higher than Apurímac; however, it is representative, as the miners state that they essentially work to pay for transportation.

The processing plant is paid 20.5%, while 7.1% of the operating cost is allocated to the 35 workers. 3.2% is spent on dynamite or explosives, which is the most used input, 1% is paid to the collector and 1% to the local community.

To sell the product, the miner usually makes use of an invoicer, who charges 25% to 30% of the value of the copper concentrate. In this case, 25.2 kg of copper is obtained per ton of concentrate, which has a value of US$ 665,004.36. This means that the invoicer receives US$ 166,251.09.

The company of eight miners would therefore earn US$ 57,783.27 for this operation. The Huancavelica miners state that the data presented in Table N° 14 are very close to the profits they make; however, they emphasize that the profits are not immediate, and take between one and two months to become liquid. This greatly limits the opportunities that they may have to invest locally. **For the miners, the expenses they incur in transportation are very high. They state that the costs are high for the activity, but point out that it remains profitable for them considering the head grade of their ore.** They would, however, prefer to have a concentrator plant in Churcampa to ease their operating costs.

Like Apurímac, in Huancavelica, the invoicer and the transporter are also “spirits” that appear to the miner. The miners state that it would not be convenient for them to appear in the SUNAT, because they would pay a lot of taxes. They therefore prefer to pay 25% or 30% to the invoicer and 60% (+/-) to the transporter. Nevertheless, there is a view that the invoicer or transporter acts in either a good or bad manner towards them, depending on the circumstances.

Table N° 14: Model of expenses of a 30-day ASMC campaign in Huancavelica - January 2024*

INPUT	UNIT OF MEASUREMENT	# UNITS USED	COST X UNITS USD	SERVICE LIFE (MONTHS)	MONTHLY COST USD
General Manager / Accounting	Monthly	1	1,700.00	1	1,700.00
Office rental / Internet	Monthly	1	500.00	1	500.00
Administrative expenses	Formalization / relationship	1	2,000.00	1	2,000.00
Diesel and Electric Mini Dumper	Engine (1.5) and capacity 2.5 Tn	4	6,000.00	4	6,000.00
Diesel 4500 Generator	UBERMAN energy generator	2	1,750.00	4	875.00
Oxygen compressor	30-550HP Air compressor	2	2,500.00	4	1,250.00
Basic mining carts	Capacity 1 Tn.	10	600.00	4	1,500.00
Breathing masks / headsets	Industrial for mining	35	50.00	12	145.83
Ventilators	For underground mining	3	1,000.00	12	250.00
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Safety clothing	Industrial for mining	35	40.00	12	116.67
Waterproof boots	Industrial for mining	35	30.00	12	87.50
Mining boots	Industrial for mining	35	40.00	12	116.67
Helmets	Industrial for mining	35	14.00	12	40.83
Lamps	Industrial for mining	35	16.00	12	46.67
Pneumatic drilling machine	Complete units with equipment	5	2,500.00	6	2,083.33
Picks	Industrial for mining	35	5.00	12	14.58
Torches	Industrial for mining	35	5.00	12	14.58
Mining sacks	Hundreds	10	14.00	1	140.00
Mats	Dozens	100	4.00	1	400.00
Timber battens	Dozens	100	5.00	1	500.00
Famesa Semigelatina Dynamite	Box of 25 Kg / 45 and 80	35	405.00	1	14,175.00
Petroleum	Gallons	200	6.00	1	1,200.00
Gasoline	Gallons	100	3.50	1	350.00

Table N° 14: Model of expenses of a 30-day ASMC campaign in Huancavelica - January 2024*

INPUT	UNIT OF MEASUREMENT	N° UNITS USED	COST PER UNIT USD	SERVICE LIFE (MONTH)	MONTHLY COST USD
Water	Cisterns	4	20.00	1	80.00
Food	Per person/day	35	10.00	1	350.00
Chef	Monthly	2	350.00	1	700.00
Worker	Monthly	35	900.00	1	31,500.00
Transport / dump truck	3,000 Tons*	3,000	90.00	1	270,000.00
Community payment	10 % of raw mineral cost	1	4,500.00	1	4,500.00
Collector	10 % of raw mineral cost	1	4,500.00	1	4,500.00
Other inputs (mechanical workshops, welders, wicks, injuries)	10 % of raw mineral cost	1	4,500.00	1	4,500.00
Concentrator plant service	USD 30 per Tn. (1.5 head grade)	3,000	30.00	1	90,000.00
TOTAL GROSS EXPENSES	USD				440,970.00
Concentrator plant service	90% recovery (13.5kgxTn) + 4% loss (0.54) =12.96 kg/85.4%	1	294,115.58	1	665,004.36
Invoicer	25% of mineral concentrate	1	73,528.89	1	166,251.09
NET INCOME	USD				57,783.27

* The campaign model lasts 30 days. It is a common ASMC company model of eight partners and 35 workers. The company is formal and registered in the REINFO. All purchases are made in the informal markets in Churcampa, Ayacucho and Pisco. The exchange rate from USD to Nuevos Soles is 1:3.7. The costing exercise has a production of 3,000 Tn with a head grade of 2.8% copper during January 2024.

** Sale of raw mineral USD 15 per Tn. In this model, 3,000 Tn were produced with a value of USD 45,000. International copper value CVSUSDxLb=399 / 1kg=2.2046 Lb.

*** The value calculation was based on 25.2 kg x Tn / 1Tn= 25.2 Kg or 55.555 Lb x Tn / 3000 Tn = 166,667.76*3.99 [Lb] = 665,004.362 USD

The miners from Apurímac and Huancavelica take their ore to Nasca and Pisco, due to the availability of plants to process it and a greater price offer. On the other hand, there are processing plants in the Andean area, but they belong to large-scale copper mining companies. In this sense, transportation plays a determining role. The transporter has a monopoly on the rate; according to the miners, this is based on the distance between the mining operation and the destination plant that the miner chooses. Therefore, a price is set per ton, according to the distance. The trucks from Apurímac to Nasca or Pisco, for example, usually charge US$80 per MT; from Huancavelica they charge an average of US$90 per MT; and, lastly, from Ica they charge approximately US$8 per MT. As we can see, the ore transportation rate in the Andean zone can exceed those of the costal zone by up to 10 times. Therefore, this stage is moderately critical throughout the supply chain in terms of profitability, especially for ASMC in high Andean regions.

ASMC miners use a series of social strategies that allow them to obtain more profitable prices for their operations. During the investigation, we observed that the miners establish friendly relationships with the transporters based on locality, mother tongue and similar sociopolitical opinions, as well as kinship relationships such as compadrazgo (cronyism). Whatever type of interpersonal relationship is established, miners usually invest time and money in keeping it as stable as possible.

Transportation is a sensitive area in any commercial activity; however, we observed that it is critical for ASMC miners to have this stage controlled and ensured within their precarious legal and operational situation, since it directly affects the profitability of their operation. Transporters certainly obtain significant profits from this activity, which is why they also seek to establish stable relationships with miners and maintain their clientele.

When trucks travel on the highways, they are subject to control, especially by the National Police. This is where transporters usually deploy their extensive network of contacts, especially with those responsible for the control posts in areas through which their units travel. For miners, this network of contacts is a guarantee to use this service, as they are given the assurance that their ore will arrive at the destination plant without problems.

These gray areas described for the ASMC mining operator have also been analyzed at the global and market level in the two largest copper producing countries in Latin America: Chile and Peru. Hany and Podesta (2019) state that there is a degree of under-invoicing of exports of copper products (refined copper concentrates and cathodes), as there is evidence of the existence of commercial copper transactions at unit prices lower than the market value. Although there have been efforts to make progress in this area, there remain complex challenges to address in order to comprehensively supervise mining activity. Rojas (2019) also highlights the existence of commercial price manipulation in Peruvian exports of copper concentrates between 2003 and 2017.

The data analyzed by Rojas show abnormalities between transaction prices and expected export prices, which vary depending on the price filter used. The asymmetries observed could be explained using different hypotheses; however, the gaps identified in all scenarios indicate a level of manipulated export billing, which deserves further analysis.

Another element to analyze in the copper market is that the largest exports in Peru and Chile are copper concentrates. The Chilean Copper Commission (2021) indicates that the share of copper concentrates in the total global market has progressively increased. In the case of Chile, more than 55% (2020) of the value of exports of copper products correspond to concentrates, with a strong tendency to increase in the coming years. It should be emphasized that an important aspect in the valuation of copper concentrates, in addition to the treatment charge/ refining charge (TC/RC), is the penalty for impurities. For example, in Chile, arsenic levels reached 63%, 67% and 62% in 2018, 2019 and 2020. Alarcón (11/02/2024) indicates in a recent newspaper article that, in Peru, there is a lack of control of the metals used in the energy transition that are exported. In copper concentrates, in particular, there are large amounts of tellurium, among other minerals.

In conclusion, we see that the copper supply chain has many gray areas that need to be analyzed carefully and in greater depth.

A possible line of further study would be to establish the bottlenecks in the ASMC supply chains and their relationship with the formal exports of different international companies.

3.

RURAL TRANSFORMATIONS AS A RESULT OF ASMC

Expansion of social networks

Miners are very active characters due to their territorial displacement and establishment of social networks, both with their mining peers and the communities in which they operate. The extraction of certain minerals generally responds to market demand and the international price of products. In the study areas, ASM miners have indicated that the materials they exploit have polymetallic characteristics, with an emphasis on copper and gold. An evaluation of the nine case studies analyzed indicates that many of the ASMC miners have first been gold miners; however, in the face of market demand, many who previously saw copper as a residual metal have now turned their interest towards it.

The ASMC population is mainly characterized as workers who have come from ASMG, and gained experience in that field. They are mostly of Andean origin, which means that they are migrant workers in coastal areas and local workers in the mountains.

In the departments of Apurímac and Huancavelica, there is a strong specialization in copper extraction. The participation of a community organization that manages mining operations is more frequently observed, regardless of their formality, informality or illegality. Another element that facilitates the process is the level of participation of the local population. **In Huancavelica, there is a medium level of participation among its population as a mining workforce in large-scale mining projects. This has clearly contributed to the knowledge that ASMC miners have, since their work experience in large-scale mining projects has made it easier for them to understand ASMC production and commercialization processes, although this knowledge is more empirical than technical.**

In Apurímac, the situation is somewhat more unique, as, according to MINEM (2023), the participation of the population in large-scale mining operations is only 9%. Therefore, we anticipate that the knowledge they apply in ASMC operations comes from having worked outside their department; upon returning to their communities, unable to find work in the department's large-scale mining projects, many have opted to exercise this knowledge within their communities, promoting and teaching ASMC.

In Nasca, the miners tend to be less specialized.

Many of them come from Ayacucho Department, so have a more extensive knowledge of the extraction and commercialization of gold. Even so, faced with market demand and the rise in the price of copper, many gold miners have chosen to exploit and commercialize copper, without abandoning gold extraction altogether.

Certain cultural patterns are replicated between ASMG and ASMC. The miners do not identify different cultural practices between copper and gold. On the other hand, experiences with ASMG miners confirm that they see copper as a weed that grows around the gold vein. They expressed this sentiment when the price of copper was low, and it was treated as a residual mineral. However, market pressure has now made miners gravitate from exclusively extracting gold to considering copper as a high-value mineral.

The study has shown that miners who extract both minerals have a broader network of suppliers than those who only extract a single type of mineral. Once the mineral leaves the mine, the process ceases to be similar, and different stakeholders give it their own particular complexions. For this reason, miners have to establish supply and trade networks that allow them to sell their products. We were able to observe how they use the kinship system (nuclear, extensive and compadrazgo) as a strategy. Arrangements such as compadrazgo are the most used, as they allow the establishment of fixed supply and trade points. In many cases, this situation leads to a dependency that is very difficult to break.

In summary, the stakeholders in the social network of ASMC miners interconnect on the basis of mutual benefit; they are not isolated entities. We can conclude that the ASMC miner has a broad willingness to establish commercial relationships, based on local sociocultural strategies.

Dynamism of organizational structures and new stakeholders in the community scenario

Mining transforms the physical spaces in which it is established and, in turn, energizes the relationships and structures within communities. This study has revealed how, in Apurímac Department, peasant communities have decided to turn towards a business-type organizational structure, forming communal mining companies.

In 2019, the Bartolomé de las Casas Center in Cusco released a publication titled Derechos Humanos y Dinámicas Socioambientales (Human Rights and Socio-Environmental Dynamics), which reveals different rural dynamics in the framework of large-scale mining activities and ASM. This research provides a look at the changes in the economy and culture of populations that practiced agriculture, before transitioning to ASM and large-scale mining activities (Cusiyunca, 2019).

The dynamics identified – from a management-type organizational structure to a business one – are derived from long-term experiences with large-scale mining companies and ASM miners, an experience that can also be negative. **The experience with the former is that they tend to break their agreements, and with the latter that, in some cases, they are accused of violent actions. At times, the arrival of both tends to generate divisions in the community, creating pro-mining and pro-agricultural movements.**

The constitution of a communal company, for many communities, means the reaffirmation of their right to the management and control of their resources, both to confront mining companies and the invasion of illegal miners. Valdes et al. (2019) state that the realities of ASMC and ASMG are very marked in the communities of Apurímac, and it is necessary to consider that we are facing new ASM processes. For more than two decades, ASM studies have characterized the ASMG miner as a migrant. However, we can see that the same indigenous peasant communities practice mining activity, restructuring their organizational patterns in support or rejection of ASM.

The case of the peasant community of Tapairihua is interesting in this sense. The community's experience as a result of its poor relationship with the Los Chancas project has led them to advocate a communal business model That allows them to legalize the agreements that they have with the different miners who work in their territory and to carry out extraction themselves.The community is making use of a legal mechanism contained in the General Law of Peasant Communities, Law No. 24656, which allows them to establish themselves as such.

Communal companies are generally established around agriculture, and there are many examples of this type of organization, whether in agriculture or livestock. However, in recent decades, communal mining companies have become increasingly common. In the formation process, conflicts are often generated within the communities, which weakens their organizational structure and response to violent invasion actions by illegal miners. Castro (2023) indicates that this situation is common in the community of Colquemarca in Cusco.

The literature also provides examples from Huancavelica, Cusco and Apurímac of conflicts between peasant communities and ASM/large-scale mining. This literature includes theses in anthropology and law from Adriazola (2021), Alata (2016), Castañeda (2020), Diaz & Laime (2018), Hopfgartner (2017), Narváez (2021), Puga & Tito (2019), Quispe & Vargas (2020), Ruiz (2021), and Salas (2014). The fact that these theses focus on southern Peru – Apurímac and Cusco – shows the prevalence of this phenomenon there.

For this study, it has been possible to identify patterns in the characteristics of the communal mining companies that have been created over the course of the communities' experiences with large-scale mining companies and ASM miners, whether these experiences have been good or bad. The formation of the companies generates a group of political, religious and social idiosyncrasies, where each individual in the community establishes a position in accordance with their interests and aspirations.

The arrival of mining can accelerate structural changes in the community. Furthermore, communities with the presence of mining end up experiencing a commercial explosion, where it is common for community members with some capital to invest in the supply of inputs and services. This trend transforms social organization, with the emergence of a commercial petty bourgeoisie that differentiates itself from the rest of the community, due to an increased purchasing power and political influence.

The miner who owns mining operations also experiences a change, as they accumulate capital that they tend to invest in commercial activities in their communities of origin, or as a partner in other mining operations. This stakeholder is often taken as an example of economic success, which often encourages the residents of their community to enter mining activity.

These miners also tend to extend their social networks beyond the communities or districts where they carry out their work, connecting with political and economic figures in the capital cities of their province or department.

Transporters, invoicers and collectors also experience an increase in their profitability with regard to the demand for their services. For this reason, they also become part of this emerging petty bourgeoisie that develops around the extraction of artisanal copper. The emergence of these elites energizes the interaction between communities and commercial cities such as Andahuaylas, Cusco and Abancay, especially due to the demand for inputs and services. In the long term, the relationship between communities weakens, and ties with departmental or provincial capitals begin to strengthen.

On the other hand, significant changes also occur within family units. **For example, the absence of working-age men means that the entire burden of raising school-age children falls on women, in addition to having to care for crops and livestock. This generates an additional physical and emotional burden on women who have mining partners.** We observed how, on occasion, these women are relegated in the community of origin while their partner is dedicated to mining activities.

The precariousness of artisanal mining causes families to experience high levels of stress at times, given the persistent accidents, which are frequently fatal. Although faced with this stress, the need to obtain economic resources takes precedence in order to overcome the shortcomings and needs that families in the high Andes experience daily. **Thus, for many families, mining has become the key that would allow them to leave the situation of poverty in which they find themselves.** Its rapid profitability relegates other activities, such as agriculture, on the scale of work interest.

Gender aspects

The research carried out on ASMC has revealed that there is a role assigned to women in copper operations. It was frequently observed that women are consigned to mineral selection activities, and classified as **"who gives shape and size to the copper stone".**

Unlike in the gold mines, these women are considered mine workers. However, they are at a disadvantage, since their wages are lower than those of the men who work in mines. Their remuneration is approximately 60% of the male salaries.

Finally, during the research, we observed that the women who work in copper mines are relatively young, most likely related to the miners who work in extraction. This implies that ASMC can be classified as a family activity, in which members of a working age are involved, although this assumption requires further study.

In the prioritized departments, there is not much difference in the role of these women. Perhaps where they differ most is in their characterization in each locality. They are local to Andean areas such as Apurímac and Huancavelica, whereas they are migrants to areas like Nasca, just like their family members who work in the mine.

We observed women owners of mining operations, as in the case of Cobre Pampa. These women carry out organizational and commercial work for their operation, as their peers do. They also take care of their interpersonal relationships, always seeking to obtain the best prices for inputs and commerce. In some cases, we observed that foremen were placed inside the mine to maintain order in production among the workers. This is another area that should be studied in greater depth, in order to accentuate gender differences in the sector.

4.

LIMITATIONS OF THE ASM LEGAL FRAMEWORK TO INSTRUCT ASMC

Law No. 27651 (2021) was approved by the Congress of the Republic of Peru to establish the first regulatory framework for the exercise of ASM in Peruvian territory. In the first instance, this law recognizes the importance of ASM in the economic and social life of the country. According to this law, the State promotes and protects ASM. It also characterizes ASM, establishing metrics and production capacity. **For example, it establishes a possession limit for the SMP of up to 2,000 hectares (4,942 acres) and a production capacity of up to 350 metric tons per day; while the AMP has a maximum possession of 1,000 hectares (2,471 acres) and a production capacity of 25 metric tons per day.** Among other aspects, the main points of the law were not fulfilled as expected (artisanal mining development plan, and support plan for small-scale mining, among others).

During 2016 and 2017, new decrees were enacted. In October 2016, DL No. 1244 strengthened the fight against organized crime. On December 30, 2016, DL No. 1293 was issued, declaring the formalization of small-scale and artisanal mining of national interest. On January 4, 2017, DL No. 1320 was issued, which modifies the General Mining Law. On January 5, 2017, DL No. 1336 was issued, which regulates mining formalization. Finally, on January 6, 2017, DL No. 1351 was issued, which modifies the concepts of informal mining and illegal mining within the spectrum of ASM.

It is also useful to state that during the first 10 years after the formalization process began, there was no budget to implement the formalization of miners. Furthermore, the government's current budget for this area barely reaches 2% of MINEM's annual budget (Pachas, 2019).

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The National Multisector Policy for Small-Scale Mining and Artisanal Mining to 2030 was approved in 2022, with the aim of consolidating a country vision for the coming years. **Among its priority objectives are: to reduce the social, labor and environmental precariousness of ASM; to increase access to formal value chains for ASM activities; to increase ASM access to mining rights' ownership and surface land use authorization; and, lastly, to improve coordination between entities related to ASM in Peru**. The policy considers elements such as territoriality, human rights, interculturality, gender, value chain and human development, with a cultural, differential and intersectoral approach. Furthermore, the policy also commits other state institutions to participate in addition to those of MINEM, such as GORE, MIDIS, MIMP, MINAM, MTPE, MEF, SUNAT, SUNAFIL and MINSA.

This is the first state policy for the mining subsector, defining the responsibilities and commitments of the country's different public institutions, and establishing actions to fulfil the objectives outlined in this policy. However, challenges remain, such as ASM in indigenous territory and the illegality surrounding ASM activities. The policy also lacks cultural aspects that the miners could have contributed, and does not consider the socioeconomic precariousness of the miners (Pachas, 2023).

The legal context of ASM has limitations, even more so given the diversity of ASMC cases presented in this report. Even so, it is necessary to consider the following aspects that could help complement the legal understanding of ASMC:

a. ASMC production capacity.

According to Peru's Law No. 27651, small-scale mining can cover an area of up to 2,000 hectares (4,942 acres) and have a productive capacity of up to 350 MT/day. According to the same legal body, artisanal mining can cover an area of up to 1,000 hectares (2,471 acres) and have a productive capacity of up to 25 MT/day. This characterization, established in the ASM law, presents a problem that has never been dealt with: state agencies presume that artisanal mining is a homogeneous activity that lacks particular characteristics in both processing and commercialization. This research has allowed us to observe how ASMC differs from ASMG in aspects ranging from the form of extraction, processing and commercialization to the typology of workers. The idea that ASMC and ASMG can be regulated under the same legal standards has been dismissed in this research. For example, Law No. 27651 establishes a maximum productive capacity of 25 MT/day for artisanal mining; however, we see that copper miners in the areas studied tend to extract a minimum of between 100 and 250 MT/day. In this sense, the current Law No. 27651 cannot absorb the reality of ASMC in Peru.

b. The formalization process and extraction contracts.

The formalization process seems to have as its main limitation the extraction contracts and/or agreements with the owners of the surface land.

Pachas (2019) points out that the Peruvian State has not been able to adequately address this problem, because the implementation of government policies has been very ambiguous and has different cultural implications for the social actors involved. Furthermore, the budget is not commensurate with the complexity of the demand for the subject.

In late 2023, the Peruvian government published DL No. 1607, a decree that gives all artisanal miners in the formalization process a period of 90 days to enter into contracts with concession holders. If they do not, the miners will be expelled from the REINFO and will automatically fall into illegality. If we analyze this LD, we can see that it is nothing more than the result of poor management of a failed formalization process, and a policy that was approved two years ago of which no one takes notice. If these antecedents had been taken into account, this LD would not have been approved. This decree attempts, under duress, to carry out everything that the formalization process has not been able to do in years. For ASMC miners, it is a hard blow that places them at a disadvantage to concession holders, who tend to subject them to contracts that are often abusive and unfavorable to them. This LD now provides a framework within which to do it legally, since there is no rule that regulates contracts between the ASM miner – much less the ASMC miner – and the concession holder, obliging the miner to accept any type of conditions imposed by the concession holder so as not to lose their REINFO registration.

c. Determination of environmental parameters for ASMC.

The monitoring of and support for these tools tends to be limited. The DREMs of the areas studied, for example, unanimously maintain that the budget is too small for them to be able to carry out effective compliance observation and technical support with ASM miners. Therefore, they often cannot respond to the needs of the miners when they request support. In the case of ASMC, the situation is the same, as this category essentially does not exist, and there is no particular environmental plan for this type of mining. There needs to be a recognition of the singularities of each type of ASM extraction.

Given the lack of environmental impact parameters for ASMC, miners do not know how much they are able to impact the communities that host them. Much less are they able to measure their own emissions, whether of greenhouse gases or chemicals, or how to remedy or prevent them. Parameters are understood as the particular conditions that must be achieved and maintained in an environment to meet the quality standards of air and water, and the preservation of a territory's physical conditions and the health of its people. There has been no study carried out that could determine how much exposure to the sulfide of this mineral affects the miner or the population.

d. ASMC supply chain legal transparency.

This research has exposed a critical issue, which is the feeling of need and rejection that ASMC miners feel about the processing plants. Many of the miners interviewed stated that the plants keep the tailings, which, despite the fact that they may have a good relationship with them, gives the miners a certain distrust of these companies. Additionally, two stakeholders were mentioned about whom very little is known: the invoicers and the buyers. Throughout this research, there have been little data available about them. Even so, **we have identified that both stakeholders move and operate somewhere between informality and legality, especially the invoicer.**

The ASM law has established production limits, which are not consistent with the reality of ASMC production. This loophole is taken advantage of by the invoicers, who "legalize" ASMC mining production in exchange for a high percentage of it. For this reason, the national ASM policy must consider a modification in which exceptions are established for ASMC. If not, invoicers will continue to handle a significant part of the country's ASMC production.

The buyers of copper concentrate are stakeholders of whom miners have little knowledge. During the course of the study, they were not able to establish whether the buyers were natural persons or mining companies. They knew neither the identities of their buyers or the destination of their production. A possible hypothesis is that the buyers are mining companies that complete their monthly production with the purchases that they make from ASMC miners. It is also possible that the invoicers seek to be as invisible as possible in their relationships with ASMC miners, so as not to be linked to problematic situations such as accidents or deaths.

In summary, there is a lack of transparency and information for ASMC miners. Current regulations and laws do not ensure or promote transparency. The lack of control and consistent oversight makes ASMC production imperceptible; it therefore becomes a ghost production for state organizations such as MINEM. For this reason, it is necessary to legislate and articulate a series of actions with the private sector, in order to reach a better understanding of ASMC.

The lack of control and consistent oversight makes ASMC production imperceptible; it therefore becomes a ghost production for state

e. Relations between ASMC and large-scale mining

There is quite visible competition for resources between ASMC and large-scale copper mining companies, which has even taken the form of recurring conflicts and confrontations. The reasons and arguments generally invalidate each other, which makes coexistence difficult. These conflicts have been created on the basis of mining legislation and administration, the overlap of mining concessions, the prevalence of the rights of companies over the rights of communities, and the lack of technical knowledge on the part of the Peruvian State to organize the territory. The concurrence of these factors has reduced the possibilities of dialogue to generate harmonious coexistence.

We believe that ASMC and large-scale mining can achieve the minimum conditions to allow a positive and stable coexistence to be established and sustained over time. This could occur even in areas such as Apurímac Department, where relations have strongly deteriorated. Here, agreements could be reached that would allow both parties to become business partners. In the absence of legislation in this regard, competition for copper sulfide between ASMC and large-scale mining companies will continue.

f. Differential approach within ASM

ASMC miners in Peru currently face severe legal, labor and economic precariousness. There is currently no law, plan or project that recognizes ASMC's particular characteristics – such as the existence of women in copper mining – or that regulates contracts between concession holders and ASMC miners, which tend to be very unfavorable for contract miners.

The current multi-sector national policy for small-scale and artisanal mining follows the guidelines of Law No. 27651 and characterizes ASM in a homogenous manner. Therefore, it ignores the particular commercial and extractive characteristics of each extracted mineral. Consequently, there is an undifferentiated formalization process that has produced few results so far. Focusing attention on this differentiation with a pluralistic vision of ASM could help reduce conflict situations that have increased in recent years around ASM in Peru.

It is possible that ASMC is an activity that is outside of the national institutional focus. Although its existence is known, the regulations still do not recognize it as an activity independent of its own social and production characteristics.

On the one hand, there is an opportunity to favorably influence the establishment of a set of rules adapted to the characteristics of ASMC that would characterize and make visible the conditions of the population that practices it. On the other hand, it would allow stakeholders such as ASMC collectors, concession holders, plants and transporters to be adequately controlled and managed. Finally, there are opportunities to understand the new global dynamics of the international demand for copper and establish regulatory mechanisms to regularize and strengthen this sector.

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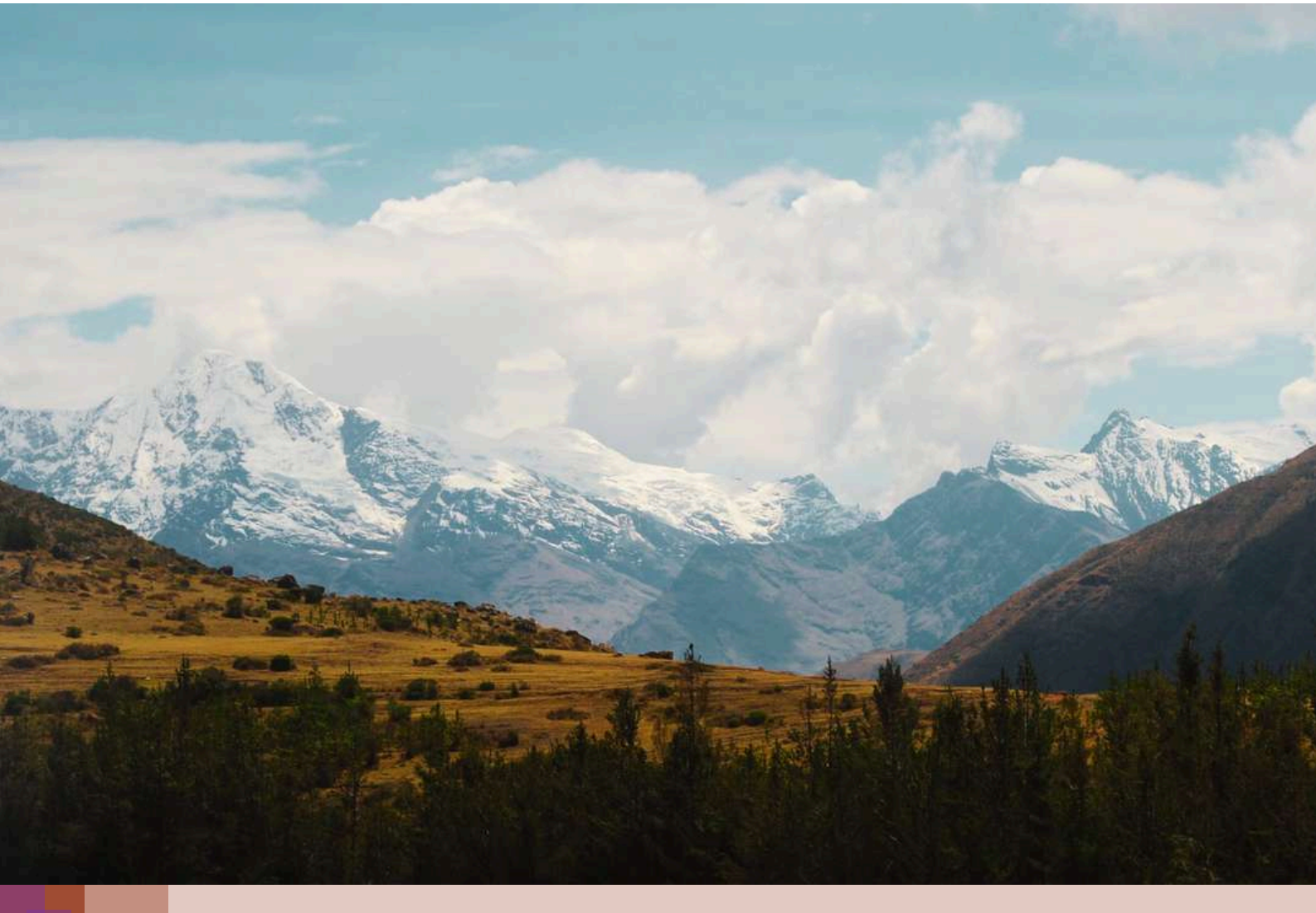

I.V CONCLUSIONS & RECOMMENDATIONS

ASMC in Peru has been invisible to both government entities and civil society. The research has revealed how the different norms and legal provisions of ASM in Peru have not differentiated its particular characteristics, both in the formalization processes and policies aimed at this sector. **The production reports that the Peruvian government publishes annually do not consider ASMC production; therefore, the real dimension of national production and its contribution to international trade is unknown**. It is estimated that the ASMC population in Peru is 100,000, of whom 50,000 are dedicated exclusively to copper extraction and the remaining 50,000 combine copper and gold extraction.

Due to the characteristics exposed in this report, it could be argued that ASMC in Peru is, to a large extent, an activity that is carried out informally and, at times, outside the law. A high margin has been found for strengthening interventions in areas of mining safety and hygiene, as well as environmental management. Despite the technical characteristics of semi-mechanized extractive operations, there is little support in terms of comprehensive technical assistance to these communities. **ASMC miners perceive that their operations are not as polluting as ASMG miners, due to the absence of mercury use in processing.** However, it is necessary to delve deeper into these practices in order to determine the real impact of these operations in Peru.

- **It is important to invest in the implementation of environmental impact studies in ASMC environments to determine impacts on communities and their territories.** It is important to attract the attention of research centers and universities to generate a more robust body of knowledge.

The majority of the populations immersed in ASMC in Peru are administratively categorized as peasant communities and population centers in both Andean and coastal areas. This study has characterized the ASMC mining population as predominantly Quechua indigenous. It has also established an average age range of between 18 and 45 years for both men and women. Furthermore, the presence of women day laborers was identified in activities similar to pallaqueo (the collection and selection of minerals from the rocks removed in mining operations), but with differentiating characteristics.

The role of the women involved in ASMC is unique. They are involved in mining operations, but their number is associated with how extensively dynamite is used. Once the mineral is extracted from the mine to the surface, women are associated with stone-crushing activities, in order to give it the shape and size requested by the processing plant. Miners cannot take ore to the processing plant without it having the required dimensions. In operations that combine copper and gold extraction, women also have to separate the copper from the gold rocks, so that the mining operator can process them.

We saw no sign of child labor, although the presence of young people between 18 and 20 years old involved in operations inside the mine was notable.

A very important finding in the ASMC value chain was the role of the invoicers and transporters. These two stakeholders benefit the most from the current condition of ASMC miners. The study has shown that in all prioritized areas, these stakeholders manage to monopolize a large part of the profits from the activity. Approximately 30% of the value of the concentrate produced is taken by the invoicers, and up to 60% of the profit goes towards transportation. In addition to the other expenses incurred, this leaves the miners with profit margins of between 5% and 10% for what they produce on a monthly basis.

For ASMC miners, this type of mining is a slightly profitable activity. The small-scale ASMC companies that are formed state that there is a high risk in each campaign because accidents – some of which are fatal – can occur, although no records are kept in this regard. None of the ASMC companies with which we established relationships indicated that they earn a lot from copper extraction. On the contrary, they indicate that their profit is sometimes lower than planned, largely because the invoicer, transporter and processing plant take the bulk of the profit.

- We observed a tendency for miners to develop a relationship of dependency with these stakeholders in the supply chain. The ASMC supply chain in Peru currently lacks transparency.

  In copper mining in Peru, there is competition for control of deposits between large- and medium-scale mining, artisanal mining, small-scale mining, informal mining and illegal mining. This competition has originated from the inability of the Peruvian government to exercise correct management of the territory, in addition to its weak capacity to safeguard the human and territorial rights of its citizens. This competition tends to fall into acts of violence, which end up complicating the dialogue processes between the different stakeholders. However, we observed the intention among ASMC miners to get along with large-scale mining companies.

  The relations between ASMC and large-scale copper mining depend on the economic, social and cultural contexts of each area, and they can be tense as well as positive. It has been observed in ASMC that the relationships between miners and the other stakeholders with whom they interact are governed by circumstantiality. Depending on the context, collaboration between ASMC and large-scale mining is a viable alternative, despite the different conflicts that are present in all the regions prioritized in this study.

- We were able to observe an interest among ASMC miners in working or supporting large-scale mining, which leaves the door open to future collaboration. **ASMC miners would be interested in using the plants of large-scale mining companies, as long as they offer them a fair price.** Some even state that they would be happy to sell their product directly to them.

- ASMC in Peru is making changes to the composition and structure of the social organization of the peasant communities in which it takes place. Given this situation, we have observed how communities have also begun a process of transition from peasant communities or population centers to communal mining companies. This process is clearly creating internal frictions, where informal miners, mining company representatives, local groups and anti-mining organizations become politically involved. The formalization process should include prior education for miners who are from peasant and Quechua-speaking communities, explaining the complexity of the processes that an ASMC miner will face.

  Taking into account the methodological limitations of this study and, at the same time, given the opportunity to generate possible lines of action and reflection, we propose that interested stakeholders undertake a short-, medium- and long-term process that includes the following elements:

- In the short term, the Peruvian government, particularly MINEM, could:

  i) **Diagnose the ASMC problem at a legal, social, gender, environmental and economic level in order to develop, include and manage the particular characteristics of ASMC in Peru within existing legislation**;
  ii) Promote the comprehensive formalization of ASMC, considering not only the miners but also the stakeholders involved in its supply chain;
  iii) Estimate monthly and annual production averages, as well as the real contribution of ASMC to the copper mining sector;
  iv) Generate and apply an ASMC traceability model in which the behavior of the stakeholders in the supply chain is identified and monitored.

  In the medium term, interested civil society stakeholders could:

  i) Promote training processes to train ASMC miners in the criteria of the CRAFT Standard for legal supply chains, within the framework of OECD due diligence criteria;
  ii) Promote the experiences of ASMC miners with legal supply chains within the framework of the CRAFT Code Standard;
  iii) Promote spaces for meetings, discussion and reflection for miners and national unions with the Peruvian government to make the problem more visible;
  iv) Design agendas and roadmaps for ASMC miners;
  v) Develop advocacy processes to make visible the role of ASMC miners in different domestic and international instances;
  vi) Develop educational protocols to support peasant and indigenous communities that are involved in ASMC activities.

  In the long term, the private sector and large-scale copper mining companies could:

  i) Implement strategic alliance models between large-scale mining companies and ASMC miners, so that large-scale mining companies can provide processing services and/or purchase copper concentrate from ASMC miners;
  ii) Promote a traceability model for ASMC miners, which would be useful for companies to be certain of the ore entering their concentration plants and strengthen the transparency of commercial processes.
  iii) Promote social responsibility actions, training and educational processes for ASMC miners and communities on various topics of interest for sustainable and inclusive development.

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ARTISANAL AND SMALL-SCALE COPPER MINING IN PERU

FUNDED BY:
ISEAL INNOVATIONS FUND, WITH THE GENERAL SUPPORT OF THE PRINCIPAL DONOR SWISS STATE SECRETARIAT FOR ECONOMIC AFFAIRS - SECO

FUNDING AND DEVELOPMENT CONTRIBUTIONS:
PROYECTO MINSUS DE LA GIZ
THE COPPER MARK
INTEL CORPORATION

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ALLIANCE FOR RESPONSIBLE MINING (ARM)

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The realization of the project was possible thanks to a grant from the ISEAL innovations fund which is supported by:

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Economic Affairs SECO

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MAY 2024, MEDELLIN, COLOMBIA.