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Precariousness and risk in informal mining: a phenomenological study of working conditions in La Rinconada, Puno

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ABSTRACT: Objective: To analyze the repercussions of informal mining on the working conditions of miners in La Rinconada (Puno), focusing on the experiences of its protagonists and how precariousness, insecurity and the absence of labor rights shape their daily lives.

Theoretical Framework: It is based on phenomenology to explore the intentionality, consciousness, epoché and eidetic reduction of the miners, and incorporates critical theories such as dependency, the world-system, social capital, stratification and the political economy of extraction to understand how global and local dynamics perpetuate labor precariousness and exploitation in informal enclaves.

Method: A qualitative phenomenological design was used, with in-depth interviews, focus groups and non-participant observation. The sample included 32 key informants (mine workers, pallaqueras, contractors, authorities and police). Data were collected through flexible guides and observation protocols, and analyzed by thematic coding, categorization and construction of hermeneutic networks to identify patterns and the “essence” of the experience.

Results and Discussion: A multifactorial precariousness is identified: lack of drinking water and sanitation, absence of protective equipment, inhalation of mercury and toxic gases, poor ventilation, extreme cold and long or fragmented workdays (12-hour shifts, 3×2 schemes, “cachorro”). Internal insecurity—assaults inside the mine—and the normalization of risk make up a “limit existence” where the injured body is both witness and victim of exploitation. The lack of state supervision and community defense mechanisms deepens this dynamic, making exploitation part of the miners' professional identity.

Implications of the Research: It provides a framework for designing comprehensive formalization policies that combine regulation of working hours, provision of PPE, ventilation and sanitation equipment, continuous training and effective supervision, along

with the strengthening of social capital and community participation. These strategies are essential to transform daily precariousness into decent and sustainable work. Originality/Value: Presents a unique phenomenological approach to the study of informal mining by fusing critical structural theories with experiential testimonies in a highly vulnerable enclave. Its findings provide essential data to improve the relationship between State, company and community, and to guide occupational health and labor rights strategies in extreme contexts.

1. INTRODUCTION

Mining constitutes one of the pillars of the Peruvian economy, contributing close to 10 % of the Gross Domestic Product and two thirds of the country's exports, and positioning Peru as a world leader in the production of copper, silver, zinc, tin and gold (Congreso de la Republica del Perú, 2024; Manrique & Sanborn, 2021). During 2023, iron extraction grew by 34.1 %, followed by lead, silver, zinc, gold, copper and tin, while the departments of La Libertad, Arequipa, Cajamarca, Ayacucho, Cusco, Puno and others consolidated their contribution to national production (MINEM, 2023; CooperAcción, 2024). However, this boom hides growing tensions: the formal and informal development of the sector has led to social conflicts due to its environmental impact, institutional and -most especially- labor (BBVA-Research, 2023; De Echave, 2020).

In the town of La Rinconada, in the district of Ananea (Puno), informal and artisanal mining generates extreme working conditions that resemble pre-industrial models. Miners face workdays of up to 12 hours and “cachorro” modalities that prioritize extraction volume over safety, while lacking the provision of personal protective equipment, occupational health training and access to basic sanitation services (Valdés et al., 2019; Del Carpio, 2023). The absence of safety engineering and training instances increases exposure to toxic gases, dust and mercury in meltwater (Romero et al., 2020; Yandún et al., 2023), which aggravates rheumatic and respiratory diseases and strengthens a cycle of multifactorial precariousness. In addition, gender inequalities are intensified in the work of pallaqueras, who perform mineral sorting tasks without legal recognition or salary (Rodríguez, 2022; Cazorla, 2012).

Despite the abundance of studies on the environmental and economic impacts of informal mining, there is a lack of research that examines systematically and from the perspective of the workers themselves the day-to-day dimensions of their employment conditions in extreme altitude and climate contexts. The works of Valdés et al. (2019) and Del Carpio (2023) have documented specific details-such as the “cachorro” system and the absence of basic services-but a holistic analysis that integrates these experiences into a solid and binding conceptual framework with occupational health and labor rights policies is lacking. Likewise, although the literature by Cazorla (2012) and Rodríguez (2022) has highlighted the invisibilization of pallaqueras, there are few studies that delve into how this double gender subordination interacts with the generalized precariousness of working hours and protective equipment. Given this scenario, it is essential to analyze in depth the repercussions of informal mining on working conditions in La Rinconada, in order to provide evidence to guide formalization, social protection and occupational health policies adapted to these highly vulnerable environments (Echave, 2016; Torres, 2015; Roma, 2021; Sandoval & Arciniegas, 2022; Violeta & Trujillo, 2016).

To fill this gap, the present research adopts a qualitative phenomenological approach to capture the essence of the experiences of the miners of La Rinconada as they experience them (Van Manen, 1990). Through in-depth interviews and focus groups, we will seek to reconstruct the intentional structure of their experiences -from the inhalation of dust and mercury to the acceptance of “normal conditions” of risk- and to understand how these experiences shape their work identity, their expectations and their perception of social justice. In this way, the aim is not only to describe, but also to interpret the way in which workers constitute their everyday world under a regime of exploitation.

The objectives of this study are, first, to characterize the main impacts of informal mining on working conditions in La Rinconada -health, safety, hygiene and gender-, and second, to analyze the dynamics of normalization and resistance that emerge from these conditions. With these results, we intend to offer operational recommendations for the design of public policies for formalization that include the provision of personal protective equipment, ventilation and sanitation protocols, regulated workdays and mandatory training mechanisms, as well as the incorporation of a gender perspective in risk management.

2. THEORETICAL FRAMEWORK

Theoretical approach to analyze working conditions, employment and economy

Informal mining in Peru, especially in localities with weak state presence such as La Rinconada, is characterized by highly precarious working conditions and serious socio-environmental risks. Although this activity provides a source of income for thousands of people, its lack of regulation or poor institutional control exposes workers to occupational diseases and modern forms of exploitation (Sacha, 2022). While income may increase with “cachorro”, labor instability and harmful health effects - due to the handling of mercury and other toxic substances - are constant (Torres, 2015; Cárdenas & Saraiva, 2019). In regions such as La Rinconada, miners face grueling workdays without access to basic rights, which perpetuates an informal system that legitimizes exploitation (Hopkins et al., 2020). The lack of protective equipment and the absence of occupational health training exacerbate their exposure to physical and environmental risks (Brousett-Minaya et al., 2021).

Dependency theories maintain that, within the framework of global capitalism, developed countries consolidate their growth at the expense of peripheral nations, which are relegated to exporting raw materials at low prices and importing expensive manufactures (Cardoso & Faletto, 2002). This economic imbalance not only promotes one-sided economies, but also perpetuates low-paying and risky jobs, while slowing the emergence of local industries and limiting social welfare. In this sense, although informal mining in Peru can inject significant income, the distribution of these benefits is unequal and reinforces dependence on extraction rather than favoring economic diversification and improved living conditions.

The world-system perspective divides the planet into centers, semi-peripheries and peripheries interconnected by complex exchange networks (Wallerstein, 1974). The central countries, with greater technological and financial development, obtain resources from the periphery at low cost and sell manufactured products at much higher prices. The semi-periphery, in an intermediate role, shares traits of both extremes, but never achieves the economic and political control of the center. In La Rinconada, informal mining reproduces this pattern: it extracts resources for external markets, increasing both local exploitation and global inequality gaps.

In terms of social capital, Putnam et al. (1994) define this concept as the web of networks, trust and norms of reciprocity that facilitates collective action and strengthens governance and community well-being. However, Bourdieu (2001) expands on this idea, emphasizing that elites turn their connections into a resource that perpetuates privileges and reproduces power structures. In informal mining contexts such as those of La Rinconada, the weakness of neighborhood organizations and the mutual distrust between actors-State, companies and settlers-prevent the articulation of community initiatives that improve working conditions.

Weber (2002) theory of social stratification analyzes how class, status and power shape the position of individuals in society. In informal mining, workers tend to occupy the lowest strata in economic and prestige terms, lacking political influence and social recognition. This lack of power reinforces their vulnerability and limits their opportunities for mobility, keeping them trapped in a dynamic of exploitation. The political economy of resource extraction, proposed by Bridge (2008), focuses on how the exploitation of raw materials-minerals, oil, gas-shapes power relations and the distribution of wealth at global and local scales. Economies that depend excessively on the export of natural resources face challenges such as environmental degradation, community displacement and conflicts over territorial control. In La Rinconada, this extractivist logic fuels disputes, corrupts institutions and deepens inequalities, while preventing the consolidation of sustainable economic alternatives.

3. METHODOLOGY

3.1 Access to the field

This qualitative study adopts a phenomenological approach to understand the experiences of miners in La Rinconada, exploring the “how” of their experience before the “what” (Hernández-Sampieri & Mendoza-Torres, 2018; Van Manen, 2017). Through epoché, prior judgments are suspended to describe reality as expressed by participants (Finlay, 2009; Giorgi, 2012; Van Manen, 2020a, 2020b).

La Rinconada, at 5 100 m a. s. n. m., is one of the main artisanal and informal mining enclaves in Peru (INEI, 2018). To enter the field, the institutional endorsement of local authorities and the National Police was arranged, whose presence guaranteed our safety and facilitated the identification of risk areas (Rodríguez et al., 1996; Alejo & Osorio, 2016). Similarly, the Ananea Corporation enabled access to the “industrial zone” and direct contact with contractors and workers dispersed in the area.

At the same time, links were established with shopkeepers, grassroots leaders, educators and health personnel, forming a social map that located the interactions between key actors (Goetz & LeCompte, 1984, cited in Rodríguez et al., 1996). However, distrust of recordings and fear of reprisals led many to refuse written consent, so we opted for repeated oral consent, guaranteeing anonymity and confidentiality.

3.2 Selection of informants and situations observed

To access key voices, convenience sampling was used - to select mine workers, and snowball sampling that allowed reaching subjects that were difficult to identify (Balcázar et al., 2013; Alejo & Osorio, 2016). More than the quantity, the depth of their contributions was valued (Mendieta, 2015), choosing informants with more than six months of experience in the mine, long-term residence and willingness to share their experiences.

The collection faced distrust of recordings and fear of reprisals, which forced the substitution of written consent for oral consent, ratified before each meeting. Likewise, the validation of informal authorities (Corporación Ananea, community leaders) was essential to overcome local hierarchies and facilitate access to work areas. These methodological adaptations made it possible to address the complexity of an environment characterized by precariousness, informality and generalized caution.

3.3 Data collection and recording strategies

In order to document the experiences of the miners of La Rinconada, in-depth interviews were mainly conducted (Rodríguez et al., 1996), based on a flexible guide that covered topics ranging from daily routine to working conditions, safety and the environment, which facilitated trust and detailed accounts. Complementarily, focus groups guided by an open discussion were organized to contrast different perspectives, and non-participant observation was used, supported by a protocol with key items to be recorded (Katayama, 2014).

The qualitative data analysis followed three strategies: first, a content analysis that coded text fragments to identify emerging categories and patterns (Krippendorff, 1997); then, a thematic analysis that delved into recurring themes and their context (Barbour, 2007); and finally, a narrative analysis that examined the full narratives to understand how participants construct and communicate their experiences (Ríos, 2016). These combined techniques allowed for a comprehensive and nuanced reading of perceptions of informal mining in La Rinconada

3.4 Data analysis and categories

The qualitative analysis followed a four-stage phenomenological process to reveal the essence of the mining experiences: i) Immersion and transcription: interviews and field notes were carefully transcribed to capture not only the words, but also inflections and pauses (Borda et al., 2017; Hernández-Sampieri & Mendoza-Torres, 2018).

Thematic coding: Inductive codes were generated from the language of the participants -for example, “precarious working conditions” or “constant fear”- that organized text fragments according to their meaning (Vives & Hamui, 2021). Categorization: Codes were grouped into broader categories and subcategories-such as Employment and vulnerability, Perception of insecurity, and Environmental impact and community health- structuring the information in a coherent way (Rodríguez et al., 1996).

Phenomenological interpretation and hermeneutic networks: through reflexive readings, the “essence” of each category -feeling of helplessness, naturalization of precariousness, resignation- was explored and networks were constructed showing how these themes interact and reinforce an environment of multiple vulnerability (Hernández-Sampieri & Mendoza-Torres, 2018; Miles et al., 2014).

4. RESULTS

Figure 1 shows a conceptual scheme centered on the node “Impact on working conditions” from which eight thematic blocks emerge. These blocks, reflecting various risks and points of vulnerability specific to informal mining, are linked by solid arrows to indicate hierarchical or causal links and dotted strokes to indicate cross-cutting connections. Each category is accompanied by fragments of testimonies (framed in white) that directly illustrate the findings.

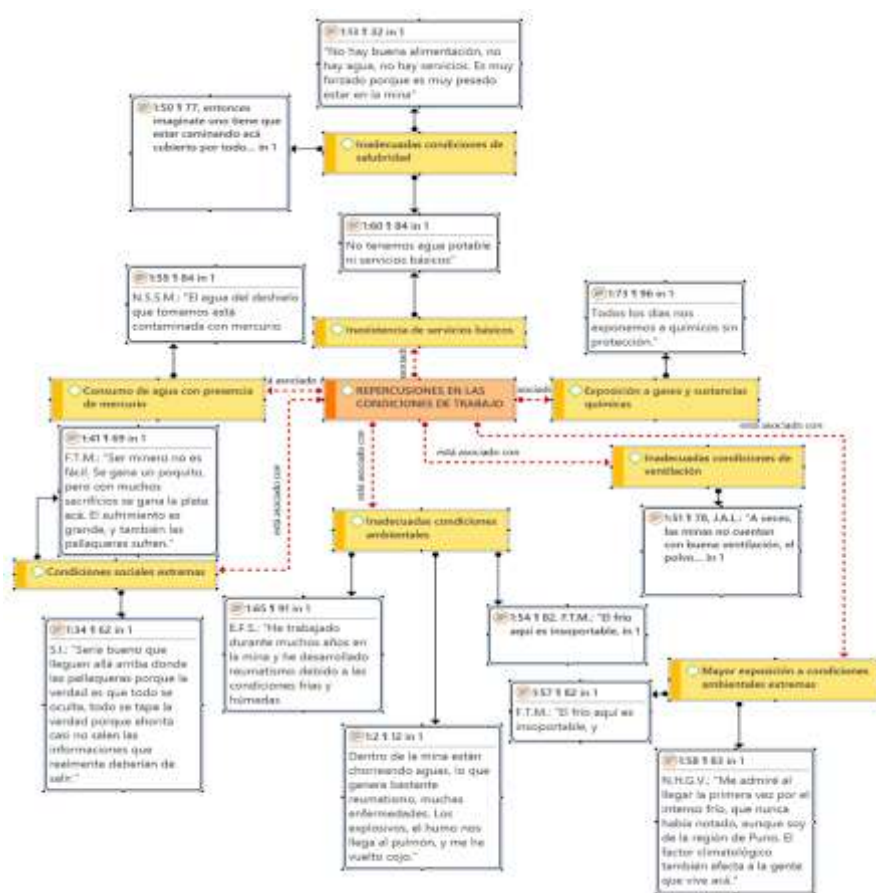
The working conditions in informal mining in La Rinconada are manifested, above all, in the persistent lack of sanitation: "There is no good food, no water, no toilets. It is very hard work because it is very hard to be in the mine" (P32). This deficit is not an isolated fact, but is directly linked to the lack of basic services, a reality that the miners themselves denounce frankly:

“We have no drinking water or basic services” (P84). The absence of sanitary infrastructure and a sanitized water supply, in turn, prefigures the consumption of water contaminated with mercury, as described by one of the interviewees: “The melt water we drink is contaminated with mercury” (P84). This episode of intoxication is inseparable from the extreme social conditions that demand strenuous workdays without any protection; “being a miner is not easy... The suffering is great, and the pallaqueras also suffer” (F.T.M., P69), summarizes the hardships shared by men and women who depend on this activity to survive.

At the same time, exposure to gases and chemicals becomes another daily risk vector: “Every day we are exposed to chemicals without protection” (P96). This vulnerability is aggravated by the inadequate ventilation conditions in the galleries, where “sometimes the mines do not have good ventilation, the dust...” (J.A.L., P78) accumulates and penetrates the lungs, intensifying respiratory hazards. The conjunction of humidity, dust and cold is condensed in the broader category of “inadequate environmental conditions”, which one miner expresses as follows: “Inside the mine they are dripping water, which generates a lot of rheumatism... I have become lame” (P12). Thus, the incidence of these waters and the lack of hygienic drainage systems give shape to an environment that rapidly deteriorates the body.

At the same time, the altitude and extreme climate amplify these conditions, as another worker relates: “I was amazed when I arrived the first time because of the intense cold... The climatological factor also affects the people who live here” (N.H.G.V., P83). The cold altitude not only conditions the appearance of rheumatic and respiratory diseases, but also contributes to normalize the daily struggle against an adverse climate, making it an inseparable part of the miner's identity. Taken together, the eight categories - from lack of sanitation and basic services, through water contamination and exposure to toxins, to insufficient ventilation, miserable environmental conditions and extreme cold - make up a working landscape where precariousness and risk are intertwined. Each of these dimensions reinforces the others, so that informal mining in La Rinconada reveals itself as an integral phenomenon of physical and social vulnerability, in which the worker's body becomes both witness and victim of a system that exploits both its resources and its health.

Figure 1 Conceptual diagram of the impact of informal mining on labor conditions in La Rinconada.



The interdependence of working conditions in informal mining in La Rinconada forms a web where each deficiency reinforces the next, generating a vicious circle of risks. In the first place, the absence of basic services -potable water, adequate sanitation- leads to inadequate sanitary conditions, and these facilitate the consumption of water contaminated with mercury, closing a causal chain that endangers the health of workers from the first sip. In turn, poor ventilation in the galleries increases the inhalation of gases and chemical substances, while extreme humidity and cold - components of the environmental conditions - aggravate musculoskeletal problems and respiratory ailments, so that each factor not only acts on its own, but reinforces the damage caused by the others.

To this basic chain of risks are added feedback elements: continuous exposure to dust and toxins weakens the immune system and predisposes to chronic conditions, which in the presence of adverse environmental conditions -intense cold and high humidity- become even more serious. At the same time, the extreme social conditions - exhausting working hours, lack of rest, invisibilized roles as “pallaqueras” - intensify the physical and psychological vulnerability of the miners, as the wear and tear on their bodies accumulates without pause or protection. This combination of technical and social precariousness, added to the altitude and harsh climate, creates a high-risk work environment in which infrastructure deficiencies are superimposed on the impossibility of accessing mitigation measures.

As a result, precariousness is revealed as a multifactorial phenomenon: workers simultaneously face hazards of poor hygiene, chemical exposure, extreme weather and social pressure, all without legal coverage or safety protocols. Their occupational health is compromised on several fronts: rheumatic and respiratory diseases, heavy metal poisoning and extreme fatigue are direct manifestations of these integrated conditions. In addition, gender inequality accentuates this precariousness: women pallaqueras bear a double burden, performing intense physical effort without recognition, while lacking social and wage protection, which reproduces discrimination and limits their defense alternatives.

Faced with this complex reality, any formalization policy must necessarily be comprehensive. It is not enough to regulate mining activity: it is essential to guarantee the supply of clean water and sanitation systems; provide adequate ventilation and personal protective equipment in the galleries; establish protocols for continuous monitoring of water and air quality; recognize and protect the work of women, ensuring their access to social security; and, finally, adapt housing, clothing and medical services to an environment of high altitude and extreme temperatures. Only in this way will it be possible to break the spiral of risks, improve health and dignify work in La Rinconada.

On the other hand, Figure 2 identifies two fundamental axes -Labor Rights and Working Hours- which, through eleven categories, show the precariousness of informal mining. Under Labor Rights, the miners express their concern about the absence of institutional protection: “We need a mining engineer who is in charge of protecting the worker's laws. There is no adequate protection” (P21), and they denounce the lack of safety protocols at the site: “In the mine there are not enough safety measures” (P18). This vulnerability is exacerbated by the lack of personal protective equipment, since “the treatment is terrible. They don't give us PPE; we have to buy it ourselves” (P19), and the lack of formal training: “We work without adequate protection... we suffer from constant colds” (P55).

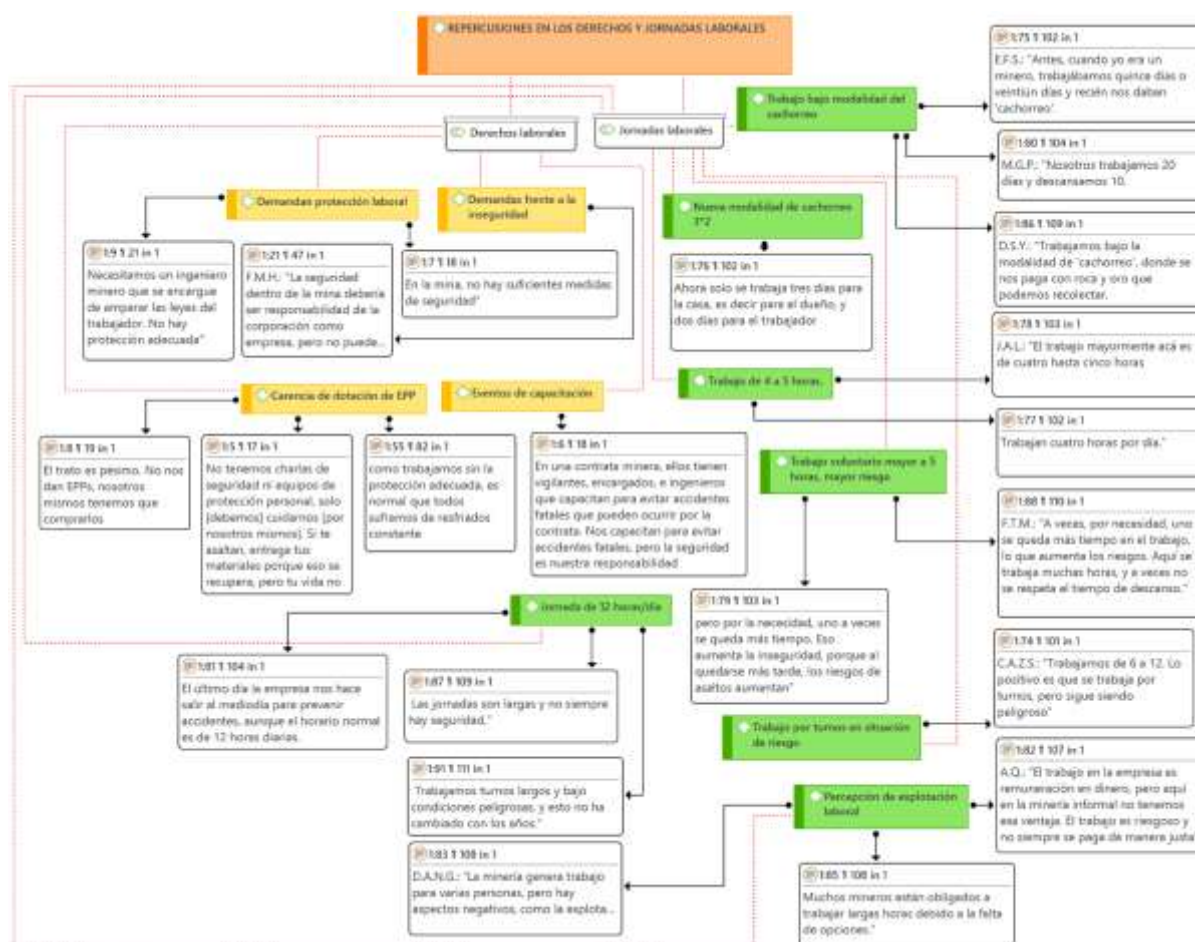
In the area of working hours, there is a wide range of modalities that, far from offering flexibility, consolidate exploitation. On the one hand, the long twelve-hour workdays - “The workdays are long and there is not always security” (P87)- coexist with the recent implementation of the 3×2 system, in which only three days of work generate income “for the house” and two for the miner, without clarity about compensation: “Now we only work three days for the house... two days for the worker” (P102). In contrast, there are shorter shifts of four to five hours a day, which are insufficient to cover basic needs: “The work here is mostly four to five hours” (P103). At the same time, traditional cachorro subsists, with payments exclusively for ore collected and periods of up to twenty-one days: “We worked fifteen days or twenty-one days and then they gave us ‘cachorro’” (P75).

To these modalities are added variable extensions of the working day - “Sometimes... you stay longer at work, which increases the risks” (P88) - and inherently dangerous shifts: “We work long shifts and under dangerous conditions, and this has not changed” (P91). In the face of this range of contractual and hourly arrangements, a sense of exploitation predominates: “Many miners are forced to work long hours due to a lack of options” (P85).

Taken together, these categories show how defenselessness in terms of labor rights (protection, safety, PPE and training) feed each other with deregulated and fragmented workdays. The absence of legal support mechanisms increases the pressure on miners to extract more ore in less time, which in turn exacerbates the lack of breaks and the neglect of safety standards. Thus,

Figure 2 reveals a vicious circle of insecurity and exploitation: without protection or training, workers accept any working hours; and without a fixed salary or guarantees, they extend their working hours to the detriment of their health and integrity.

Figure 2 Conceptual diagram of the repercussions on safety and labor rights of informal mining in La Rinconada.



In this figure, a complex framework is also evident in which the violation of labor rights and the configuration of working hours act as interdependent axes of mining precariousness. On the one hand, the absence of safety engineering, the lack of personal protective equipment and the lack of specialized training increase the feeling of insecurity in shifts that are already exhausting. This causal relationship feeds back on itself: as shifts become longer - be they the classic twelve-hour shifts, shifts longer than five hours or the 3x2 cycles of “cachorro” - fatigue undermines attention to the correct use of PPE and further narrows the margin for workers' physical and mental recovery.

This loop of risks is aggravated by the “piece-rate” method of payment, which penalizes rest and prioritizes production over health: with no fixed salary or guaranteed breaks, miners are forced to extract the maximum amount of ore possible, even at the risk of their own health. The lack of formal supervision and the lack of training make “working without protection” an accepted routine, where the norm is imposed over personal well-being.

The clash between unregulated working hours and violated labor rights leads to multifactorial precariousness: miners simultaneously face a lack of PPE, the physical insecurity of dangerous environments, the economic pressure of unstable payment schemes and the absence of protection networks or state control. At the occupational health level, this combination translates into an increase in accidents, musculoskeletal injuries and extreme fatigue, while feeding chronic stress and anxiety linked to wage uncertainty and the constant fear of a serious incident. Women pallaqueras and other vulnerable groups suffer these dynamics more acutely, bearing the same physical cost without due wage recognition or access to social benefits, which reproduces and aggravates gender and class inequalities.

To break this cycle of exploitation, it is imperative to design a comprehensive intervention that guarantees the provision and effective use of PPE, mandatory training in occupational health and safety, strict regulation of working hours and breaks, as well as active supervision of payment methods. It is also necessary to establish clear protocols for complaints and union representation that strengthen the channels for the protection of labor rights, ensuring that the formalization of informal mining goes beyond administrative registration and takes into account, in a real way, the dignity and health of those who extract ore under extreme conditions.

5. DISCUSSION

The data reveal how the life of the miners of La Rinconada is articulated around a central node - “Repercussions in working conditions” - which overflows into eight interconnected dimensions, from the lack of basic services to the inhalation of toxic substances and the scourge of extreme cold. This interweaving is not merely descriptive: each arrow and each testimony condenses direct bodily suffering. When a miner affirms “the smoke reaches our lungs and I have become lame” (P12), we are facing phenomenological intuition in action, where the wounded body becomes the foreground of exploitation without theoretical mediations.

In the dimension of the inexistence of basic services and inadequate sanitation conditions, what Valdés et al. (2019) and Del Carpio (2023) pointed out is proven: the routine of lacking drinking water, adequate food and sanitation is perceived not as an administrative collapse, but as the structural basis of labor precariousness. Applying the epoché forces us to suspend our judgment on minimum hygiene standards and to accept that, for these workers, lack is the only possible norm. Likewise, the consumption of mercury-contaminated water constitutes the crudest translation of that lack: “the melt water is contaminated with mercury” (P84) resonates with the findings of Romero et al. (2020), for whom exposure to the heavy metal is an omnipresent risk that lands as a chronic disease. Here the miner's intentionality directs his consciousness towards an inescapable danger, evidencing that survival and intoxication walk hand in hand.

On the axis of exposure to gases and chemicals and poor ventilation conditions, the testimonies - “every day we are exposed to chemicals without protection” (P96); “the mines do not have good ventilation, the dust...” (P78) - underline that the lack of safety engineering aggravates respiratory and toxic risks. Yandún et al. (2023) point to the absence of state controls as a key factor for this helplessness, while Cuenca (2022) documents the hybridization between formal and informal extraction that further reduces the margins of protection. Inadequate environmental conditions - humidity, cold, water seepage - materialize in accounts of rheumatism and lameness (P12), corroborating Del Carpio's (2023) observation of the impact of high mountain climate on health. When we add the category of greater exposure to extreme conditions - “the intense cold... affects the people who live here” (P83)-, we connect with Novoa-Villa et al. (2022), who document the high incidence of heavy metals in sediments and water, completing a circle of geographic and ecological vulnerability.

In sum, the extreme social conditions-strenuous working hours, invisibilized pallaqueras roles-indicate, as proposed by Violeta and Trujillo (2016), that community participation and multisectoral dialogue are practically nonexistent in this microcosm of exploitation. The eidetic reduction allows us to abstract the essence of this experience-limit: zero control over the environment, constant exposure and a normalization of danger that miners have incorporated into their identity. Thus, the constitution of the experience reveals that, in La Rinconada, each act of “pallaqueo” or each gulp of muddy water is not only survival, but a gesture of resistance born of the need to resign protest in order to continue to exist. Contrasting these findings with international and national literature, it becomes clear that the repercussions on working conditions are not simply variables to be controlled: they are, above all, a shared existential horizon, where exploitation is embodied in bodies that no longer distinguish between work and torture.

On the other hand, with respect to safety and labor rights, seen through a phenomenological lens, it reveals that in La Rinconada the violation of labor rights and the deregulation of working hours are intertwined to forge a landscape of continuous exploitation. Under the principle of intentionality, miners direct their attention towards the need to subsist in an environment where internal insecurity is as threatening as the work itself: “criminals enter the mine and strip the miners of their shoes to prevent them from escaping” (P12). This ingrained fear, also documented by Hopkins et al. (2020) and Del Carpio (2023), is not anecdotal but central, as it turns each day into an exercise of survival where violence is part of the labor system.

By applying the epoché and suspending any judgment on minimum safety standards, a collective awareness of abandonment emerges: “safety only operates at 30%... but inside the mine we lack the desired support or control” (J.C.M.). This perception

of lack of protection coincides with the chronic absence of state supervision noted by Yandún et al. (2023) and the undefined intertwining of formal and informal mining described by Cuenca (2022), which leave workers without any safeguards. With the eidetic reduction, the essence of this experience-limit emerges: labor exploitation and the resigned acceptance of excessive work. Exhausting workdays -from twelve-hour shifts (P87) to 3×2 cycles or short shifts of four to five hours (P102, P103)- become defining features of the mining identity. Sandoval and Arciniegas (2022) warn that these modalities prioritize performance over safety, while Briceño et al. (2022) document their cumulative effect on workers' physical and mental health. Lacking rights - EPP, breaks, training- miners integrate wear and tear and risk into their daily lives, normalizing exhaustion as a sign of professionalism (Valdés et al., 2019).

Finally, the constitution of the experience shows how this normalization is socially legitimized. In La Rinconada, the exhausted bodies and the constant sensation of vulnerability no longer arouse protest, but a silent pact of resistance. Likewise, the lack of protection - “they don't give us PPE; we have to buy them ourselves” (P19)- and the precarious hours - “Many miners are forced to work long hours due to the lack of options” (P85)- reinforce each other, forming a vicious circle of exploitation. Roma (2021) and Torres (2015) stress that, without clear protocols and effective supervision, any formalization measure fails, while Sandoval and Arciniegas (2022) insist that only a comprehensive package - regulation of working hours, provision of PPE, continuous training and labor surveillance - can restore dignity and occupational health in this enclave.

These findings acquire greater depth when integrated with critical theories of the economy and society. From dependency theory, informal gold mining feeds a peripheral model that exports profits at the expense of local communities, perpetuating precarious jobs and limiting the development of alternative industries (Cardoso & Faletto, 2002). Within the framework of the world system, La Rinconada acts as a peripheral enclave that supplies resources to external markets, deepening global and local inequalities (Wallerstein, 1974). The absence of social capital and inter-institutional trust (Putnam et al., 1994; Bourdieu, 2001) prevents collective action to improve working conditions, while social stratification condemns miners to positions of low status and power vis-à-vis corporations and authorities (Weber, 2002). Finally, the political economy of extraction highlights how dependence on natural resources generates conflicts, environmental degradation and corruption, in a circle that feeds the precariousness of life of the population (Bridge, 2008). Breaking this pattern requires comprehensive policies that combine participatory formalization, effective regulation of working hours, mandatory provision of PPE, continuous training and robust supervision and social security mechanisms. Only then can the shared experience of risk and exploitation be transformed into dignified and sustainable work.

6. CONCLUSIONS

The findings show that informal mining in La Rinconada is based on a framework of labor precariousness, environmental risks and lack of protection, which workers have incorporated as part of their professional identity. Exhausting workdays, lack of basic services and constant exposure to contaminants are experienced not as isolated anomalies, but as the daily norm. This scenario turns the miner's body into the main witness of exploitation and generates a collective resignation where danger and suffering are naturalized as unavoidable elements of survival.

To reverse this dynamic, it is essential to adopt a comprehensive approach that articulates participatory formalization, effective regulation of working hours and the mandatory provision of protective equipment and ventilation and sanitation systems. At the same time, community ties and local institutions need to be strengthened to empower workers to defend their rights. Only a combination of rigorous supervision, ongoing training, and social support mechanisms can move La Rinconada toward decent and sustainable working conditions.

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