Revista Culturales

Psychosocial Risk Factors of Artisanal Amber Mining in Simojovel, Chiapas

PERLA SHIOMARA DEL CARPIO OVANDO

ORCID

Universidad de Guanajuato, Campus Celaya-Salvatierra
pdelcarpio@ugto.mx

RECEIVED
July 16, 2021

APPROVED
December 20, 2022

PUBLISHED
January, 30 2023

ABSTRACT: This article aims to identify and analyze psychosocial risk factors of artisanal amber mining carried out by the Tsotsil population of Simojovel, Chiapas, Mexico. This is a qualitative ethnographic research study that made use of semi structured interviews, field notes and participant observations. The participants were former miners, active miners, female and male artisans, consumers and empl1oyees from cultural institutions. The results indicate that the psychosocial risk factors of artisanal mining are associated with working conditions, work informalities, multiple activities and aspects related to the ethnic origin, gender and group affiliation of those who participate in mining work. It is concluded that it is necessary to generate strategic alliances, specific proposals and actions that aim to the construction of a public policy that considers the formalization of artisanal mining, access to technology, environmental care and the improvement of living, working and health conditions of the population dedicated to mining.

KEYWORDS: psychosocial factors; artisanal mining; Chiapas; miners.

Factores psicosociales de riesgo de la minería artesanal del ámbar de Simojovel, Chiapas

TRANSLATION OF SUMMARY
Karla del Carpio
University of Northern Colorado, Estados Unidos

RESUMEN: Este artículo tiene como objetivo identificar y analizar factores psicosociales de riesgo de la minería artesanal del ámbar que realiza la población tsotsil de Simojovel, Chiapas, México. Se realizó un estudio de investigación etnográfica cualitativa haciendo uso de entrevistas semiestructuradas, notas de campo y observaciones participantes. En esta investigación, participaron mineros, exmineros, artesanos, artesanas, consumidores y personal de instancias culturales. Los resultados indican que los factores psicosociales de riesgo de la minería artesanal están asociados a condiciones de trabajo, informalidad del trabajo, pluriactividad, origen étnico, género y grupo poblacional de quienes participan en el trabajo minero. Se concluye que es necesario generar alianzas estratégicas, acciones específicas y propuestas que aspiren a la construcción de una política pública que considere la formalización de la minería artesanal, acceso a tecnología, cuidado ambiental y mejora de condiciones de vida, de trabajo y de salud de la población dedicada a la minería.

PALABRAS CLAVE: factores psicosociales; minería artesanal; Chiapas; mineros.

HOW TO QUOTE
Del Carpio, P. (2023). Psychosocial Risk Factors of Artisanal Amber Mining in Simojovel, Chiapas. *Culturales*, 11, e702. https://doi.org/10.22234/recu.20231101.e702

Introduction

Psychosocial factors are the set of perceptions and experiences that a person has about the work they perform; these consider many aspects of the worker, the working conditions and environment, and the social and economic influences outside the workspace, but with possible repercussions of this (Moreno, 2011; ILO, 1984). The International Labour Organization (ILO) in 1984 began to use the term psychosocial factors at work, indicating that these consist of interactions between work, environment, job satisfaction, and conditions of the organization while considering the capabilities, needs, culture, and personal situation of the worker outside the work context, and through perceptions and experiences that can influence health, performance, and job satisfaction (ILO, 1984, 1986).

It is important to distinguish between psychosocial factors (which can be positive and negative) and psychosocial risk factors that refer to conditions that can have harmful effects on the health and well-being of the worker (Benavides et al., 2002; Cox & Griffiths, 1996; Moreno, 2011). In this sense, the concern about occupational risks formerly focused on physical, chemical, and environmental risks; however, the interest in psychosocial risks has been remarkable since their effects on health are relevant, but their management, evaluation, and control are often difficult due to their characteristics: they have little legal coverage, are moderated by other factors, are difficult to objectify and modify, and in turn, tend to spread in space and time (Moreno, 2011).

The World Health Organization (WHO, 2022) states that risks to mental health at work may include: discrimination and exclusion; harassment, violence, or bullying; inadequate remuneration, job insecurity, excessively long or inflexible working hours; demands that make it difficult to reconcile work and family life; excessive work pace or workload; poor or unsafe physical working conditions and lack of control over the design or workload, among others. These factors can lead to perceptions of discomfort at work (Cifre et al., 2011; Gil-Monte, 2012; González-Trijueque et al., 2012) and lack of quality of work life (Blanch, 2011a, b; Gómez-Ortiz & Moreno, 2010). It is also worth mentioning that further research is needed on psychosocial risk factors at work, not only regarding employment but also concerning informal work. For this type of work in the Latin American

context some studies have reported factors linked to exposure to environmental, chemical, ergonomic risks, long working hours, and negative interaction with people (Acosta & Del Carpio, 2017; Ariaz, 2020; Caraballo-Arias et al., 2017; Juárez-García et al., 2020; Queiroz et al., 2019; Sotelo-Suárez et al., 2012).

In Latin America and the Caribbean, regarding informal work, Artisanal and Small-scale Mining (ASM) is carried out; this consists of the extraction of natural resources with little technology, intense use of labor, precarious safety and hygiene conditions, tax invisibility, environmental deterioration; and is carried out under conditions that can cause problems in the health of miners, their families, in the communities where the mines are located, and in the environment (Chaparro, 2000; Comelli et al., 2010; González-Sánchez & Camprubí, 2010; Lara-Rodríguez et al., 2020; WHO, 2017; UN, 2018; Pantoja Timarán & Pantoja Barrios, 2016; Viana, 2018). The risks that this work has on health can be chemical, biological, biomechanical, physical, and psychosocial (Arroyo & Yupanquigodo, 2005; WHO, 2017).

Artisanal mining carried out in rural areas is alternative labor for sectors in poverty since it energizes local economies and is carried out alongside other economic efforts (Chaparro, 2000; WHO, 2017; Soriano, 2015). This is the case of artisanal mining of Mexican amber. Amber is a fossil resin whose existence in Mexico has been reported in the states of Chiapas, Coahuila, and Baja California (Riquelme et al., 2016). Chiapas amber is extracted especially in the municipalities of Simojovel and Huitiupán, in the north of the state. There are also less-explored deposits in El Bosque, Pueblo Nuevo Solistahuacán, Chenalhó, Pantelhó, San Andrés Duraznal, Palenque, and Malpaso (Riquelme & Ramos, 2016). There are resin deposits also in the municipality of Totolapa (Bryant, 1983; Lee, 1991).

Simojovel stands out for having the most active mines, which are worked by people from communities such as La Pimienta, Los Pocitos, Pauchil Dos los Cocos, El Vergel, Carmen Las Limas, Montecristo, Porvenir Chanalucum, and Río Colorado (Pimentel, 2009). These are Tsotsil communities that share conditions of economic, social, and access to services disadvantages of the indigenous population of Chiapas and the country (CDI, 2016). This leads to the inhabitants having to perform multiple jobs, such as artisanal

mining, to obtain income despite the psychosocial risks that come to compromise their health, safety, and life, as happens in other countries in Latin America and the world where artisanal mining takes place (Chaparro, 2000; González-Sánchez & Camprubí 2010; WHO, 2017; Soriano, 2015; Vieira, 2015).

Despite the economic importance and the fact that historically amber has had multiple functions: ritual, medicinal, scientific, and as jewelry (Báez et al., 2019; Lee, 2004; Lowe, 2004; Poinar, 1992; Riquelme et al., 2016), an area of opportunity in social scientific research is the study of psychosocial risk affectations of those engaged in artisanal resin mining. This is a priority since among the occupations with the greatest vulnerability to psychosocial stress are operative or manual workers (Juárez García, 2007), and the informality in which it is performed generates social, medical, and legal lack of protection for those engaged in this work.

In addition, this is an indigenous population, a vulnerable group at a disadvantage compared to the rest of the population in the country (Juárez-Ramírez et al., 2014). For this reason, this article aims to identify and analyze the psychosocial risk factors of artisanal amber mining carried out by the Tsotsil population of the municipality of Simojovel, Chiapas.

Method / *Approach and Design*

This research was conducted under the qualitative approach with ethnographic design and grounded theory, considering that this approach highlights the construction nature of the social world in a process of social relations and interactions and considers that we can approach it and get to know it through observation and active and interactive participation (Ameigeiras, 2006; Bruyn, 1972). Ethnography is a social research methodology linked to the anthropological tradition, while Grounded Theory (GT) in data, developed by Glaser and Strauss in the '60s (San Martín, 2014), is based on symbolic interactionism (Blumer, 1969) and is a strategy for theory generation (Ameigeiras, 2006; Soneira, 2006). In the GT, human action is the object of study and the construction of interpretations is sought by considering the subjects' own interpretations (San Martín, 2014).

Participants

A convenience sample of 13 participants who provided information through a semi-structured interview was used: former miners, artisans (craftsmen and craftswomen), personnel of cultural institutions, and consumers of amber jewelry (see Table 1).

Table 1. Sociodemographic characteristics of participants interviewed.

No.	Sex	Age	Schooling	Occupation	Originally from	Ethnic origin
1	M	92	WR	Former miner	Simojovel	Tsotsil
2	M	65	Elementary	Former miner	Simojovel	Tsotsil
3	F	19	High School	Consumer	Tuxtla	Mestizo
4	M	WR	Engineering	Worker from cultural institution	Tuxtla	Mestizo
5	F	WR	Bachelor	Worker from cultural institution	Tuxtla	Mestizo
6	M	66	Bachelor	Consumer	Simojovel	Mestizo
7	M	WR	WR	Artisan	Simojovel	Tsotsil
8	F	WR	WR	Artisan	Huitiupán	Tsotsil
9	M	WR	WR	Artisan	Simojovel	Mestizo
10	M	WR	WR	Artisan	Simojovel	Mestizo
11	M	WR	WR	Artisan	Simojovel	Mestizo
12	M	WR	WR	Artisan	Simojovel	Mestizo
13	F	20	Bachelor	Artisan	Simojovel	Tsotsil

Note: WR: Without Reference

Instruments

The techniques used were participant observation, semi-structured interview, documentary review and analysis, and field diary. The interview consists of a meeting (face-to-face or virtual) with the objective of the interviewer obtaining information from the interviewee (Hernández et al., 2017). In this study, an interview script was constructed for former miners, artisans, personnel of cultural institutions, and consumers of amber jewelry. It was constructed from emerging categories identified in information obtained through qualitative research techniques (open interview, observation, field diary, and literature review) applied during the immersion exercise of the funded project "Artisans and Miners of Amber from Chiapas", carried out at different times in 2019, in the

municipality of Simojovel. This information allowed the identification of various difficulties before, during and after the amber extraction process and inspired the creation of a semi-structured interview script consisting of 10 questions made with the interest of obtaining information regarding the psychosocial risk affectations of artisanal amber mining.

During 2020 and 2021, an attempt was made to recover the testimony of active miners. However, due to the pandemic caused by the SARS-CoV-2 virus, fieldwork during this period was virtual, which limited the search for participants, and in 2022, due to the ravages of the health crisis, many miners paused the work of resin extraction and others had migrated to the United States, to other parts of Chiapas and the country.

Observation focused especially on instruments and workspaces, services in the communities where the resin deposits are located and in the municipality of Simojovel. This information was recorded in field diary notes referring to different events and organized by dates. This was used since it is a resource that generates the possibility of explaining the observations in written form while constituting the central area to systematize the research experience (Ameigeiras, 2006; Hernández & Mendoza, 2018). A printed and electronic documentary review was also carried out regarding artisanal mining, psychosocial risk affectations, functions that amber has had historically, especially regarding its commercialization and extraction, and about different socioeconomic and health problems of the indigenous population of Chiapas, especially in the north of the state, where the municipality of Simojovel is located.

Triangulation strategies suggested for qualitative studies were used since they provide richness, breadth, and depth of data if they come from different sources, collection forms, and actors in the process (Hernández & Mendoza, 2018). Data triangulation was performed by turning to different collection sources (interview, observation, field diary, and documentary review), and researchers triangulation (external audit) through the participation of organizational and work psychologists and social anthropologists with expertise in informal work, artisanal work and vulnerable groups, who reviewed aspects of the method (approach, designs, interview scripts, participants, information processing) and the findings of the study. Field notes and analytical memos were also elaborated for

triangulation purposes, as well as the participation of different actors of the amber value chain and review with participants during and after the fieldwork, this to evaluate whether the interpretations communicated what the participants wanted to express (Hernández & Mendoza, 2018).

Procedure

The first phase of fieldwork was face-to-face and was conducted in Simojovel and Tuxtla Gutierrez, Chiapas during 2019 as part of the funded project: "Artisans and Miners of Amber from Chiapas". The second phase was conducted during 2020 and 2021 and continued until June 2022. It was conducted remotely, through mobile devices due to the care of physical distancing indicated by health instances as a measure to prevent the contagion of the SARS-CoV-2 virus. The study followed the ethical standards of the American Psychological Association (APA, 2010) and the Declaration of Helsinki.

Data Analysis

The content of the interviews was transcribed and constituted primary documents in a Hermeneutic Unit (HU) of the Atlas.ti software version 9.0, whose analytical procedures proposed by the Grounded Theory (GT) and the benefits of the software allow for qualitative analytical practice (San Martín, 2014). This software is based on the GT, a qualitative design inspired by symbolic interactionism that attributes special importance to social meanings and considers that people are social actors who are in a continuous process of shaping their environment (Cuff et al., 1990; De la Cuesta, 2006) and considers that meanings are social products and determine action (Blumer, 1969). The use of the GT in the study of psychosocial risk factors in amber mining was considered important to identify and analyze the various difficulties surrounding it.

In the HU, significant segments (quotes) were identified and coded, and the following code families were produced: working conditions, informality of work, pluriactivity, ethnicity, gender, and population group. Each of these condensed their own codes, which are presented in figures in the results section and are the product, more than

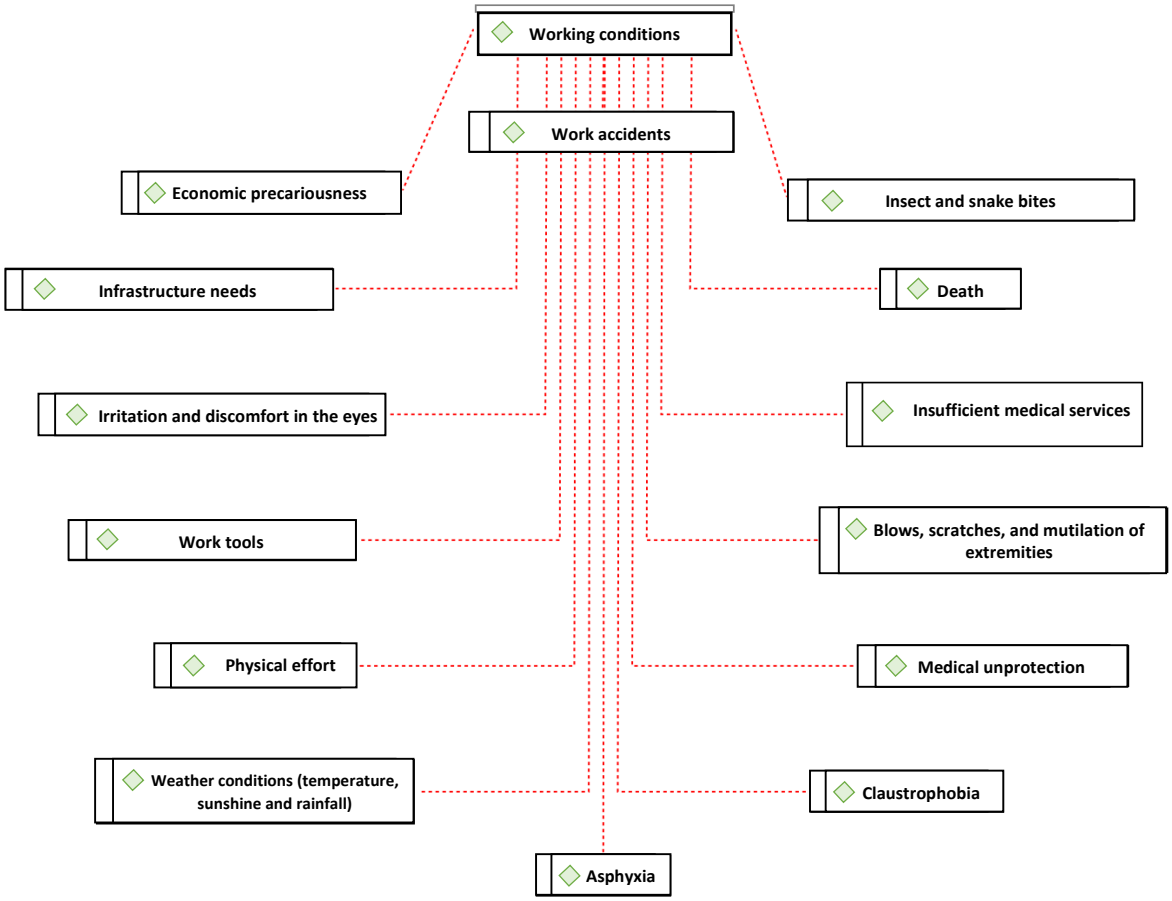
of formal theory, of the emerging information emanating from participants' testimonies and information obtained through different qualitative research techniques applied during the study's fieldwork.

Results

Psychosocial Risk Factors Associated with Work Conditions

Working conditions are the set of factors that determine the performance of an activity or task and the environment in which it is carried out; these can affect the health of workers and are related to the physical environment, the organization of the production process, the characteristics, and habits of the worker (Arroyo & Yupanquigodo, 2005). In the case of artisanal amber mining, according to the testimonies of participants and information obtained through different qualitative research techniques, the psychosocial risk factors arising from working conditions were identified as shown in Figure 1, made with Atlas.ti software.

Figure 1. Psychosocial risk factors associated with working conditions.



Source: Own elaboration (2022).

As can be seen, there are several psychosocial risk factors associated with working conditions in amber mining. The main damage to miners' health is associated with repetitive movements (picking stones and rocks), physical effort (handling loads and the task of picking stones), and body postures (squatting or lying down) that cause discomfort in the legs, arms, and spine. This is due to the use of rudimentary instruments: hammers, chisels, shovels, picks, and hammers. There is also poor lighting inside the mine, which means that the extractors use candles and headlamps:

> They use hammer, chisel and other tools to extract amber (P6, male, 63 years old, inhabitant of Simojovel, July 2019).
>
> (It is risky work) of those who extract, for example (they work) with picks, chisels and enter with candles or headlights (P3, female, 19 years old, student and consumer of amber jewelry, Tuxtla Gutiérrez, July 2019).

There is no application and use of technology in artisanal mining; equipment and investment resources are required, as well as training to create a safer extraction culture (Chaparro, 2004; Pantoja Timarán & Pantoja Barrios, 2016) that is conducive to miners' health care since chopping stones or vibrations transmitted to the hand-arm can affect limbs, joints, circulatory system, or the nervous system; while the postures demanded by artisanal mining can cause musculoskeletal damage to tendons, muscles, shoulder, hand, wrist, elbow, neck, and back (Arroyo & Yupanquigodo, 2005).

Head injuries are frequent due to rocks falling in the mine, and despite the use of helmets, they can cause injuries and various types of damage depending on the impact and its location. There are usually difficulties in the respiratory tract due to inhalation of toxic gases and irritation or discomfort in the eyes due to dust from the excavation and crushing of rocks and stones. Little light inside the mine also implies concentration and visual effort. Long working days of 10 or more hours a day cause general physical exhaustion (Pimentel, 2009).

Chemical hazards also stand out in artisanal mining and can be caused by elements of organic or inorganic matter, natural or synthetic, present in the work environment and can take the form of smoke, dust, vapor, gas, or mist (Arroyo & Yupanquigodo, 2005). High temperatures inside the mine, activity in the sun outside it, and insect or snake bites were also reported by participants:

> It can be very dangerous, there can be animals. Others are in danger because there is a lot of darkness and heat (P6, male, 63 years old, inhabitant of Simojovel, July 2019).

During the rainy season, miners avoid mining (due to the risk of cave-ins), but when they do mine, their work increases because they have to remove water with buckets (or gas pumps), which increases their physical effort. The cave-ins have caused miners to suffer blows, scratches, mutilated limbs, and even death when trapped inside the mine.

> The amber mines are very deep and very dangerous. They have been very hard worked and have caused accidents and deaths. Because of the humidity, the earth collapses from the walls of the mine and sometimes people get trapped. Inside the cave, there is a gas that is very toxic and people die inside (P6, man, 66 years old, Simojovel, April 2022).
>
> There have been many landslides [...] or they die from suffocation (P3, female, 19 years old, student and consumer of amber jewelry, Tuxtla Gutiérrez, July 2019).
>
> There are some landslides [...] and when it rains, they are crushed (P1, male, 92 years old, former miner, July 2019).

Some miners have also reported claustrophobia, however, they coped with it because they felt that "there was no other way". The working conditions of artisanal amber mining pose a threat to health (physical and mental). Some studies have indicated that the occupations with the greatest vulnerability to psychosocial stress are operative or manual workers (Juárez García, 2007; Karasek & Theorell, 1990), within which we could locate the miners. This should be emphasized since long-term exposure to psychosocial risks can generate cardiovascular, immune, respiratory, gastrointestinal, endocrine, musculoskeletal, and dermatological alterations and can also affect mental health (Caceda, 2016).

Miners continue to engage in this work because they are often immersed in environments of economic scarcity that force them to mine despite risks, unhealthy conditions, and lack of prevention and safety protocols (González-Sánchez & Camprubí, 2010; Soriano, 2015; Vieira, 2015). In this regard, some participants indicated that some support for miners has arrived in Simojovel, though it has not been sufficient.

> The artisans have received support [...]. Approximately (it was) in 2010 and consisted of helmets, chisels, lamps and hammers (P6, man, 66 years old, Simojovel, April 2022).
>
> We have requested support for safety measures, training courses to support miners, but so far, we have had no response. We need support for our miners, because they are the ones who provide us with resin (P9, artisan, Simojovel, August 2019).

In the event of work-related severe accidents, it is not easy for miners to access major medical services because there are not enough services in Simojovel and the amber region to address a critical health problem. As a result, the residents have to travel to Tuxtla Gutiérrez (the capital of Chiapas) or San Cristóbal de las Casas. This represents an investment of time and expenses for transportation, food, medical treatments, and clinical studies that they cannot always cover. That is not all. Leaving the amber region to seek medical attention can also be complicated due to landslides, especially during the rainy season, making traveling on the highways difficult. The distance to health institutions is also another obstacle in emergencies. A trip from Simojovel to Tuxtla Gutiérrez, for example, takes three hours.

The affectations generated by artisanal mining allow us to observe the health vulnerability of miners and the population of communities in Simojovel and nearby municipalities with amber deposits. These difficulties make visible the lack of protection in particular health problems and the multiple disadvantages that indigenous people face in resolving them.

This vulnerability in health is due to different social determinants (Juárez-Ramírez et al., 2014), as well as the deficiencies of medical services in the municipality and the amber region (medical equipment, health personnel, and shortage of medicines) that in serious situations the population must move to other municipalities (Bochil, San Cristóbal, or Tuxtla Gutiérrez) to receive medical attention.

This situation is not exclusive to the Tsotsil communities of Simojovel or Chiapas, but is also shared by the indigenous population of Mexico that lives in inequity and inequality in access to health services (Juárez-Ramírez et al., 2014; Lerín, 2004) and in

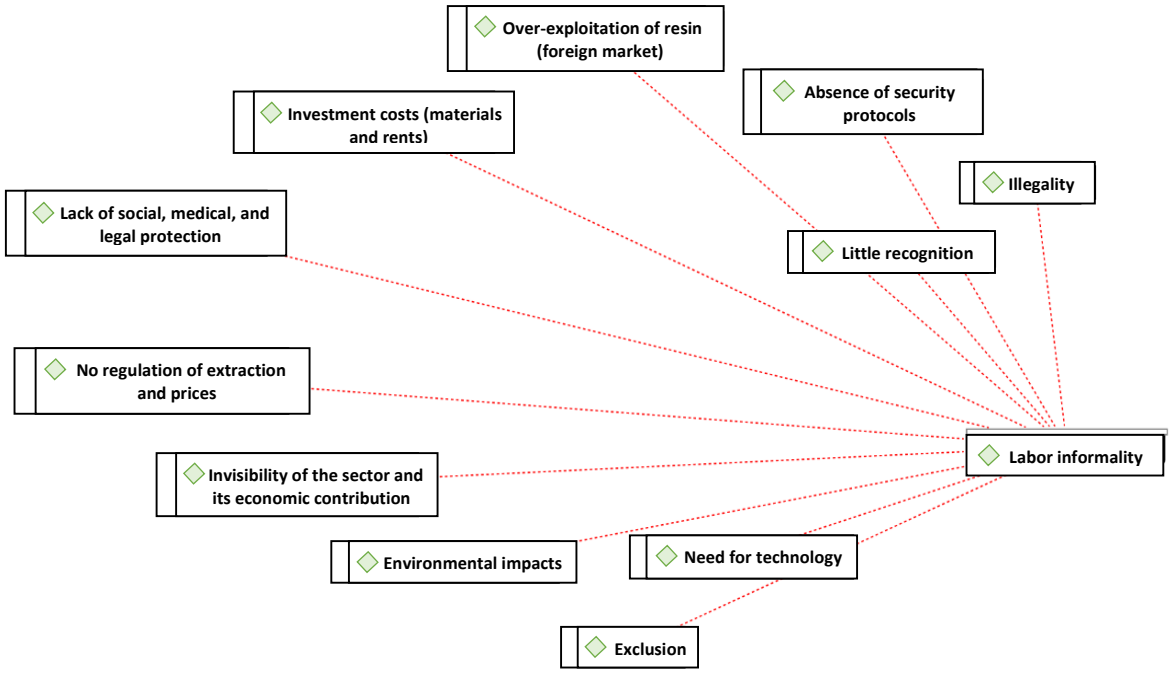
conditions of economic precariousness, a worrying situation since socioeconomic vulnerability is associated with greater risk of severity and death (ECLAC/PAHO, 2021).

Psychosocial Risk Factors Associated with Informality in Artisanal Mining

Several problems surrounding artisanal mining are due to its informal nature since it is not carried out in terms of employment. It does not include all forms of work that are economically relevant and that contribute to the sustainability of communities and societies (Blanch, 2003). Historically, certain activities have not been considered as work (Del Carpio et al., 2014; Jahoda, 1987; Perelman, 2021; Romero, 2017).

In this sense, work that is not regulated through legal contracts or legal norms stands out, as is the case with artisanal mining, which involves irregular, artisanal, rudimentary, and illegal exploitation (Chaparro, 2000), and its informality generates medical and legal lack of protection for amber miners (Del Carpio & Novelo, 2019). As shown in Figure 2, the psychosocial factors associated with the informality of artisanal mining are diverse.

Figure 2. Psychosocial risk factors associated with informality in artisanal mining.



Source: Own elaboration (2022).

The informality of mining work is expressed in different aspects. One of them is the lack of regulation or control of the amount of resin extraction (with or without the inclusion of flora and fauna), its price, and export. The contact of amber with the foreign market is part of the globalization process in which handicrafts find themselves (Ytuarte-Núñez, 2009). However, massive extraction has had environmental repercussions observed especially during the period known as the "amber fever" from 2012 to 2015 (Toledo, 2018). The exacerbated demand for resin by the Asian market increased its extraction and generated over-exploitation of the mines to find amber, polish it, and build yellow spheres requested by the foreign market willing to pay high prices for mine rent and fossilized resin.

This caused the increase of deposits exploited in places where the resin was already extracted (Pauchil Los Cocos or Los Pocitos) and caused the drilling of hills and collapse of mountains so that new deposits were opened in Carmen Las Limas, Solo Dios, Guadalupe Victoria, La Pimienta, Monte Cristo, La Ceiba, and El Chapayal (Toledo, 2018). The above highlights that artisanal amber mining, as with the extraction of other resources, is associated with its depletion and the unequal distribution of the benefits obtained from it (Campa, 2020) since, in the case of the Chiapas resin, the greatest profits (during the amber boom period) were especially for intermediaries and for the Asian market that sold it on the international market.

The informality of artisanal mining, expressed in the illegality in which it is carried out, also generates a vicious circle of poverty for miners, mining communities, and neighboring populations (García et al., 2008; Mosquera et al., 2009; Urán, 2013) who continue to live in conditions of poverty despite working mines that, as already indicated, generate wealth for intermediaries and foreign buyers (Ariaz, 2020; Toledo, 2018). It should also be mentioned that this sector carries out its work in economic and labor uncertainty and about finding the resin, the latter because the miners are never certain that they will find amber; they can spend hours, days, or weeks digging without finding any resin. The certainty they do have is that their work will involve physical effort and that they

will have to assume investment costs in work tools and in the monthly rent they must pay to the owners of the land or properties that contain amber mines (or caves).

There are no safety protocols for the miners, there is also no record of the economic contribution of mining to the municipality, and there are no records of the number of miners injured and killed in the mines. This contributes to the amber miners' invisibility, vulnerability, and importance to the Simojovel economy and the municipalities where artisanal amber mining takes place (resin extraction generates work for miners, artisans, and intermediaries). The inconsistencies in the quantifications also reflect the invisibility of the sector and the economic contribution of its work. To all this, the fact that artisanal amber mining is physical work and that forced labor has not been recognized throughout history must be added (Moreno, 2011). Work was already considered since Greek society as a way of subsistence; it lacked protection and compromised the health of those who had to perform it. Workers were considered despicable, and so was their health (Moreno, 2011). Peasants were pigeonholed with slaves and artisans since they did not work in the city or in the public sphere and could not have the character of citizens (Del Carpio, 2009; Gorz 1995).

Perhaps this vision of those earning their living by sweating and working with their hands, as is the case with amber miners, is still in force. This is somehow expressed in the discrimination and exclusion of miners and artisans, and in the lack of recognition of their work (Del Carpio, 2012), which deserves and demands formalization towards the legitimization of mining that considers: productive development (access to formal economy markets), social welfare, legal framework, and environmental care (Urán, 2013). It is important to point out that environmental aspects should be addressed jointly with socio-cultural aspects and that attention should be focused "on the culture of the region ecological potentials and on an ethic of care for life" (Leff, 2009, p. 15), for miners, communities, and the environment.

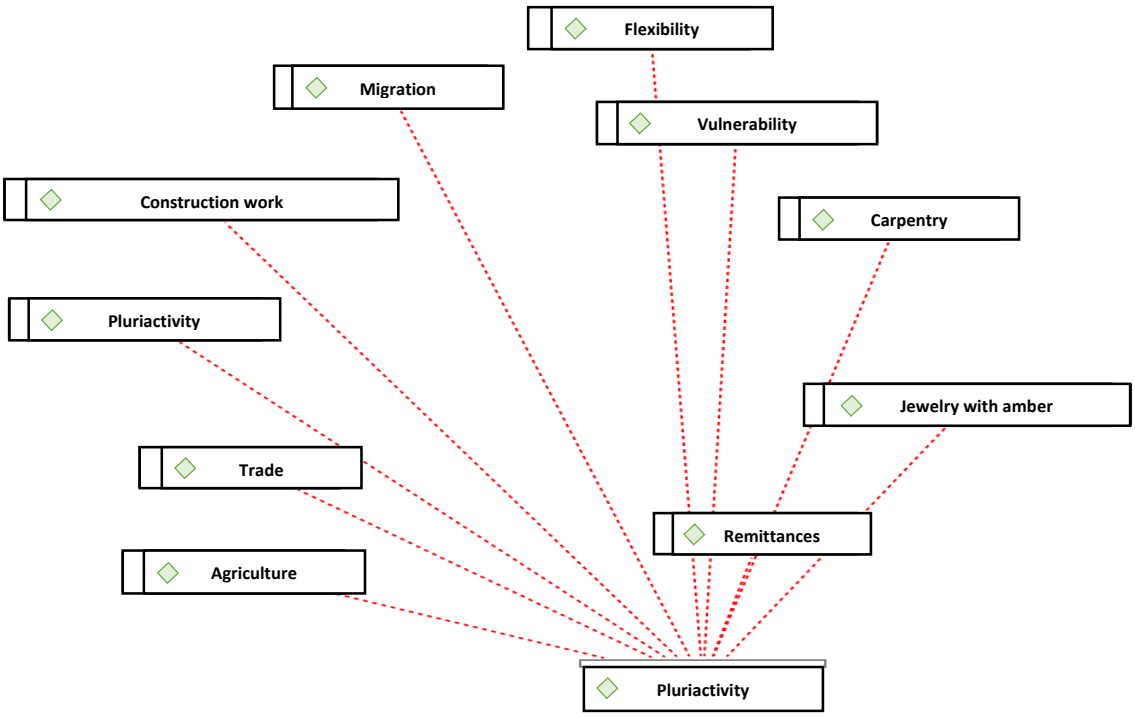
The formalization of artisanal mining also requires considering the worldview, realities, and skills of indigenous communities (Urán, 2013). As Chaparro (2004) mentions, the objective should not only be to legalize informal work but also to improve the living

conditions and safety of the mining activity for those engaged in it. Legalization, as this author emphasizes, also implies the recognition of citizens' rights in a productive sector that so far seems invisible: amber miners and the women and children who participate in checking the rubble.

Psychosocial Risk Factors Associated with the Pluriactivity of the Mining Population

The vulnerability of the indigenous people to which the Tsotsil amber miners belong is the framework in which artisanal resin mining is carried out and fosters various psychosocial risk factors, to which are added those coming from other informal jobs that, in parallel to the extraction, the miners perform: construction work, trade, carpentry, amber jewelry making, agriculture, and others. Pluriactivity has been considered a strategy to diversify household activities in order to increase income, generating the expectation that the greater the diversification, the greater the possibilities of escaping poverty (Berdegué et al., 2001; Carton de Grammont, 2009). In this regard, as can be seen in Figure 3, the psychosocial risk factors associated with the pluriactivity of the population engaged in artisanal amber mining are:

Figure 3. Psychosocial risk factors associated with pluriactivity.



Source: Own elaboration (2022).

The various jobs performed by miners require physical effort, repetitive movements, handling loads, and the effects of environmental conditions such as high temperatures or being in the rain while planting or harvesting coffee. Pluriactivity in Mexico expresses the economic instability of families in rural areas, who have shown the capacity and ability to apply knowledge to change, adapt, and innovate in the face of different labor markets (Ramos, 2018). This can be observed, for example, in the crafts and their capacity for flexibility and adaptation, which invites us to consider them and their culture as a dynamic group (Novelo, 2008), in which their labor flexibility is also notable in interstate and international migration.

Because of the job opportunities in businesses, restaurants, and hotels in the Riviera Maya (Chetumal, Cancún, Playa del Carmen, or Cozumel), this tourist area stands out within the interstate migratory circuits of the indigenous population of Chiapas (Hernández et al., 2018) and due to the COVID-19 pandemic, international migration to the United States also increased. In this regard, one participant shared:

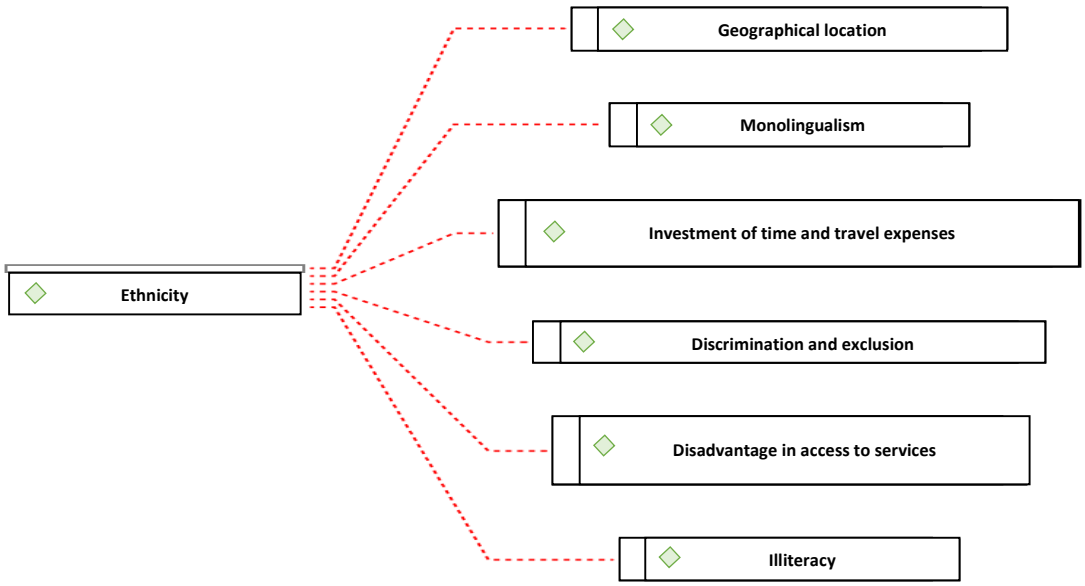
> There are few stalls in the central park [of Simojovel]. Sales are very low. The amber [trade in] is very low. They went to the United States to look for work. Those from [a community in Simojovel] are no longer coming [to the park] and some have gone to the United States (P6, man, 66 years old, Simojovel, March 2022).
>
> During the COVID period, artisans did not sell their products. Tourists stopped coming to Simojovel. Sales dropped a lot, and they are still the same to this day. Many artisans went to [other] states to work or went to the United States (P6, man, 66 years old, Simojovel, April 2022).

National and international migration constitutes a characteristic and current phenomenon of the ruralities of the Mexican southeast and accounts for the growing economic dependence that families have on external activities such as migration and sending remittances, this as part of the economic and labor reorganization (Ramos, 2018). As well as the reproduction of global economic situations in local economies and territories, as in "La tierra del ámbar" (Simojovel), where it is observed that migration, pluriactivity, labor flexibility, and the amber commercialization circuit account for the fact that the local is global (Ytuarte-Núñez, 2014), while multiple dynamic, flexible, and heterogeneous rural ways of life are built (Arias, 2003; Lara, 1998; Ramos, 2018).

Psychosocial Risk Factors Associated with Ethnicity

Regarding the psychosocial risk factors associated with the ethnic origin of those involved in amber mining activities, this study identified the ones shown in the following figure.

Figure 4. Psychosocial risk factors associated with ethnicity.



Source: Own elaboration (2022).

In addition to the difficulties mentioned so far, there are those shown in the previous diagram, which are associated with the ethnic origin of the miners and their communities: exclusive use of the native language, illiteracy, discrimination and exclusion, geographic location, disadvantages in access to various services, and investment of time and economic resources to access centralized instances in the capital city. The situation becomes more complex for the monolingual indigenous population (Tsotsil), especially for the elderly women who, although not dedicated to amber extraction, several do transform the resin and commercialize the jewelry made with it. In the Tsotsil communities, it is common for elderly women to speak only their native language and never have the opportunity to learn to read and write, hindering their access not only to health services but also to government agencies linked to the handicraft sector. When they decide to go to the institutions, for example, they are accompanied by their bilingual (Tsotsil and Spanish) granddaughters or daughters to participate as interpreters for the agencies' staff concentrated in Tuxtla Gutiérrez. Being accompanied represents economic costs that, on many occasions, are difficult to pay.

> The fact that they cannot read is quite complicated or that [...] they only speak [...] Tsotsil and Tseltal. [The fact that an interpreter accompanies them implies] an extra expense for the artisan because it is not only their fare [payment of transportation] but also that of the other person who accompanies them (P5, woman, personal instance, Tuxtla Gutiérrez, July 2019).

This is the case in Chiapas, which is one of the states with the highest number of indigenous older adults in the country, along with Oaxaca, Veracruz, Yucatán, Puebla, State of Mexico, Hidalgo, and Guerrero (INPI, 2016). This is a Federal Entity located in the Mexican southeast, which is a region that has historically been lagging behind and in which Guerrero, Oaxaca, and Chiapas are entities with the highest degree of marginalization since out of 125 municipalities in Mexico with the lowest Human Development Index, 123 are located in that region which has the largest share of inhabitants considered as rural population with the lowest productive and social indicators in the country (Ramos, 2018).

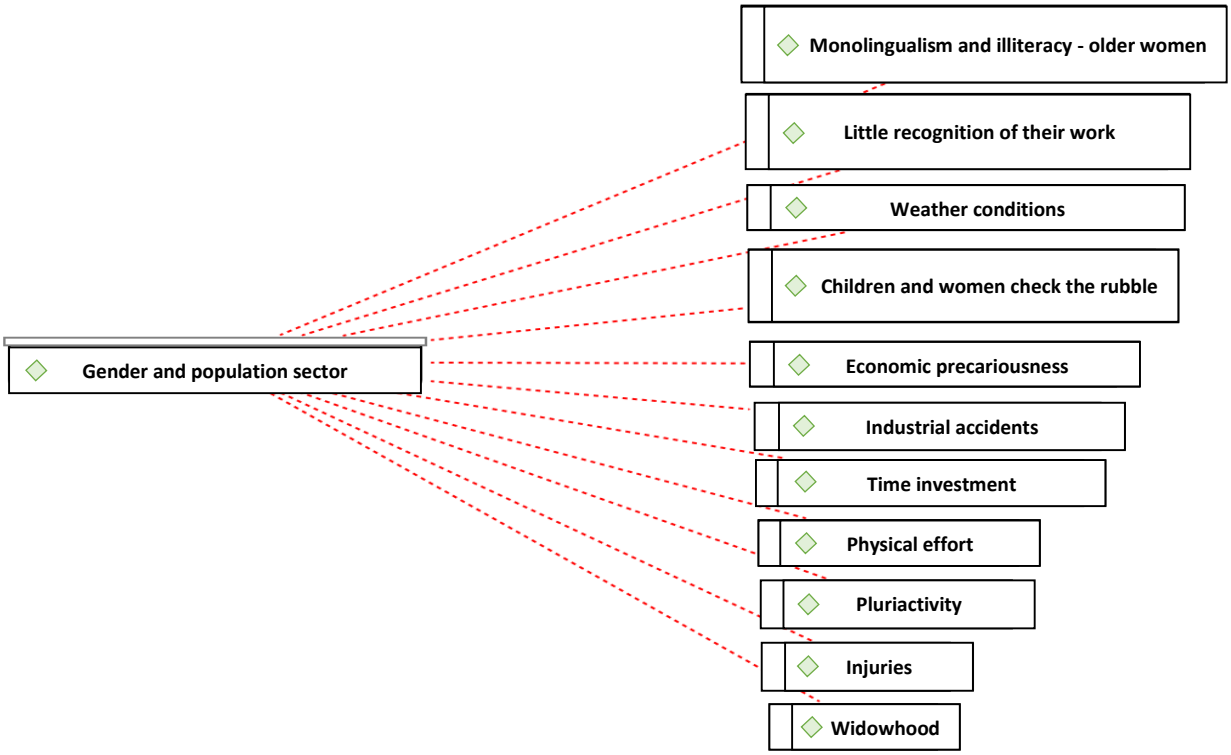
In Mexico, close to 20% of people aged 60 or older do not have social protection in health care, which represents close to 3 million people, and 1.2 million people aged 60 and older speak an indigenous language, representing 8.2% of the total number of older people and constitute one of the most disadvantaged and poorest sectors in the country (Kánter, 2021). This represents a risk due to decreased income at this stage of life (Huenchuan & Guzmán, 2006). Furthermore, in Mexico, four out of every five older adults who speak an indigenous language are monolingual and only 18% also speak Spanish (INPI, 2016).

Regarding indigenous language speakers aged 65 and over, 54% are illiterate, and 41% continue to participate economically in the labor market (Kánter, 2021). Illiteracy in the country is a serious problem in which older adults and the indigenous population stand out, which increases the vulnerability of this sector, making visible that illiteracy continues to be a social debt (Narro & Moctezuma, 2012) and that the Tsotsil people to which the amber miners belong live in a situation of socioeconomic and educational vulnerability that hinders their access to multiple services, with priority on health services. Added to this is the discrimination and exclusion that this sector of the population experiences because of their ethnic origin and the work they do (Del Carpio, 2012).

Psychosocial Risk Factors Associated with Gender and Population Sector

Some psychosocial factors identified in this study are associated with gender and population group (older women and working children), as can be seen in the following figure.

Figure 5. Psychosocial risk factors associated with gender and population group.



Source: Own elaboration (2022).

The precarious economic situation of the amber miners' families, the accidents, and the death of miners in landslides have meant a decrease in family income sources, which has led women (some of them widowed by the death of their miner husbands) and children to intensify their participation in agriculture, in the production and marketing of amber handicrafts and in various trades that can compromise their health due to weather conditions (fieldwork under the sun or rain), while demanding physical effort and time investment.

> Everyone is intensely involved in various jobs to add income to the Tsotsil families [...]. They go [to the mine] in a group of four or five people because it is a risk. More young men [participate] in the extraction, in many cases father and son. Marketing is done by the wife and close relatives. That is why there are many provisional premises in the city. Women and young people sell (P6, man, 63 years old, Simojovel, July 2019).

Children participate in household activities and in looking after the younger siblings. Women, boys, girls, and adolescents are involved in checking the rubble, which are stones that the miners place outside the mine and this sector reviews intending to find amber and commercialize it (Ariaz, 2020; Cerda, 2021). In other countries such as Bolivia, Colombia, Ecuador or Peru, the participation of children in artisanal mining has also been observed (Arroyo & Yupanquigodo, 2005; Vieira, 2015), and physical hazards such as noise, vibration, radiation, and extreme temperature changes have been reported. Along with chemical hazards and affectations due to working conditions: poor posture, handling of loads, repetitive movements, and accidents; and psychosocial factors that interfere with the mental health and personality of children (Arroyo & Yupanquigodo, 2005).

In Caribbean countries such as the Dominican Republic, the participation of women is also observed in artisanal amber mining; they are engaged in removing the stones in sacks or bags and cooking food for the brigade of resin miners (Mencía, 2016). This shows the increasing flexibilization and feminization of work in rural families (Ramos, 2018). The exposure that women, children, and adolescents have to risk factors associated with artisanal mining working conditions is usually acute (short periods of time), and miners generally have chronic exposure (prolonged times). In both cases, damage to health can be caused since injuries and diseases that can be generated in inadequate working conditions can develop progressively over time (Arroyo & Yupanquigodo, 2005).

Conclusions

In artisanal amber mining, there are psychosocial risk factors that can have detrimental effects on the health and well-being of those involved in the mining activity and on the population of the communities where the resin deposits are located. This study identified

interactions between work, environment, and the needs, conditions, and personal and community situations of those involved in artisanal amber mining. These interactions inside and outside the work context generate experiences and perceptions that influence resin extractors' health, performance, and satisfaction.

In the case of artisanal amber mining, these factors are due to the working conditions (extraction), its informal nature (carried out in terms of non-employment), the ethnic origin of the miners (indigenous population in socioeconomic vulnerability and with multiple disadvantages compared to the rest of the population in Mexico), the pluriactivity (performing various jobs), gender and age group (women, children, and adolescents involved in checking the rubble).

In addition to all this, the deficiency of services (especially those in the field of health) in amber communities located in the rural context, which highlights that the workplace can be an environment that maximizes problems that can negatively affect mental health, including discrimination and inequality based on factors such as: social origin, gender, disability, or age (WHO, 2022).

The psychosocial risk factors identified here are concerning, and the most serious are those associated with working conditions, as they threaten, compromise, and weaken the physical and mental health of those involved in artisanal amber mining. Repetitive movements, load handling, physical effort, work accidents, musculoskeletal and respiratory affectations, and the multiple damages that extraction work produces on health could perhaps be "minimized" if artisanal mining were formalized and legalized. This would allow for the creation of safety protocols and training, promote the use of technology, and possibly reduce the possibility of accidents that have so far caused injuries that have left miners disabled and caused the death of miners in the communities of Simojovel.

As long as the above is not addressed, those engaged in artisanal mining will continue to be exposed to psychosocial risks that can lead to cardiovascular, respiratory, immune, gastrointestinal, dermatological, endocrine, musculoskeletal, and mental health alterations (Caceda, 2016). This is relevant given that the amber region does not have

optimal health services because it is a vulnerable indigenous population located in one of the entities with the highest degree of marginalization and because socioeconomic vulnerability may be associated with greater severity and death (ECLAC/PAHO, 2021).

What should be done first to address these difficulties? Where to start? As Chaparro (2004) indicates, the first step is to generate a diagnosis of the sector. This is the beginning of looking at and recognizing the existence of an economic sector that until now has been "invisible". Such diagnosis would make it possible to identify areas of opportunity and carry out specific and contextualized actions since there are no universal strategies in artisanal mining (Chaparro, 2000). It would also allow the generation of proposals that aspire to the creation of public policies that consider the formalization of artisanal mining, access to technologies that improve resin extraction, promote environmental care, and foster better socioeconomic, working, living, and integral public health conditions (physical and mental health) for communities dedicated to artisanal mining (García et al., 2008; Pantoja & Pantoja, 2016). This implies considering an interdisciplinary, intersectoral, and intercultural model (Juárez-Ramírez et al., 2014; Lerín, 2004).

Undoubtedly, it is necessary to continue conducting research on psychosocial risk factors at work so that the study and intervention in this regard are carried out, as well as in prosperous countries (Moreno, 2011), in contexts with social, economic and health problems such as those presented here and which are linked to jobs performed in informal terms, to the rural environment, to the pluriactivity, and to vulnerable groups that have historically faced multiple struggles together: the indigenous population, women, boys, and girls.

This will allow for more inclusive approaches to the study of the world of work and to identify problems that require specific actions, which, in this case, calls for the construction of strategic alliances between health, economic, educational, labor, social, environmental, and legal bodies. It is also important to provide amber miners and artisans with access to training and indispensable technical information related to their work and the global world, including basic schooling, "so that it can be used with the freedom that favors the creative exercise of skills and abilities" (Novelo, 2008, p. 125).

Future studies should look at the experience of active miners, and consider in greater depth a gender approach and focus on children involved in artisanal mining and the various jobs in the amber communities. Continuing to strengthen research on psychosocial risk factors of informal work and conducting studies on protective factors such as coping mechanisms, resilience, and social support networks in artisanal mining work is relevant and inspires the creation of future work on the meaning, centrality, functions, and positive psychosocial factors of artisanal mining, work that condenses psychosocial, cultural, economic, and patrimonial elements of the resin considered as the "gem of Chiapas".

Research in this regard should also consider the material conditions with which this work is linked, which possibly constitutes a way of earning a living that goes beyond the economy and whose meaning has been constructed and configured based on health, political, social, historical, labor, economic, environmental, and cosmogonic elements specific to the indigenous peoples of the Amber region, since, as Alcover et al. (2012) indicate:

> From those of us who enjoy pleasant and highly rewarding jobs, to those who live in the anguish of job insecurity and precariousness, to those who are victimized, harassed or humiliated by their work, none of us can say who we are without reference to our work (p. 13).

Approaching the meaning of artisanal amber mining and what amber resin represents for the miners may allow us to understand the reasons they have for continuing to dedicate themselves to a job that compromises their lives and health, but from which they write part of the economic and socio-cultural history of Simojovel, of Chiapas and the country.

Figures 6-8. Amber mines in Simojovel and jewelry made with the resin.

Source: Del Carpio (2019).

Acknowledgements

To the Dirección de Apoyo a la Investigación y al Posgrado of the Universidad de Guanajuato for the funding granted, in the Convocatoria Institucional de Investigación Científica (CIIC) 2019, to the project: "Artesanos y mineros del ámbar de Chiapas", and to the rectory of the Campus Celaya-Salvatierra, for the complementary funding provided to conduct research stays in the state of Chiapas, which allowed the information presented in this article to be obtained.

To Dr. Rigoberto Martínez Sánchez, coordinator of the Master's Program in Cultural Studies and research professor of the Faculty of Humanities at the Autonomous University of Chiapas, for his collaboration and for allowing the research stays that allowed the fieldwork of the study. Special thanks to "El abuelo" (†), main informant of this research,

and to Dr. Victoria Novelo (†), a member of the project "Artesanos y mineros del ámbar de Chiapas" (Chiapas amber artisans and miners).

Bibliographic References

Acosta, M. and Del Carpio, P. (2017). Salud ocupacional: Impacto del oficio artesanal en artífices que realizan su trabajo en bipedestación prolongada. Revista Jóvenes en la Ciencia, 3(2), 397-402. http://www.jovenesenlaciencia.ugto.mx/index.php/jovenesenlaciencia/article/view/1743/1247

Alcover; C., Moriano, J.; Osca, A. and Topa, G. (2012). Psicología del Trabajo. UNED.

Ameigeiras, A. (2006). El abordaje etnográfico en la investigación social. En I. Vasilachis de Gialdino (Coord.), Estrategias de investigación cualitativa (pp. 107- 151). Gedisa Editorial.

American Psychological Association [APA] (2010). Ethical principles of psychologists and Code of Conduct [2010 Amendments]. APA.

Arias, P. (2003). Diversidad rural y relaciones de género en México, ayer y hoy, Estudios del Hombre, 17, 15-46.

Ariaz, R. (2020). Ámbar mexicano y dominicano: un análisis desde la perspectiva de sus actores [Tesis de Maestría, Colegio de Postgraduados, COLPOS].

Arroyo, R. and Yupanquigodo, L. (2005). Peligros, riesgos y daños a la salud de los niños y niñas que trabajan en la minería artesanal. https://www.ilo.org/ipec/Informationresources/WCMS_IPEC_PUB_6544/lang--es/index.htm

Baez, J.; Vargas-Alfaro, V. and Jimenez-Halla, O. (2019). Ámbar: una gema de interés comercial, histórico y químico. Naturaleza y Tecnología, 6(3), 5-14. https://www.researchgate.net/publication/338983504_Ambar_una_gema_de_interes_comercial_historico_y_quimico

Benavides, F.; Gimeno, D.; Benach, J.; Martínez, J.; Jarque, S.; Berra, A. and Devesa, J. (2002). Descripción de los factores de riesgo psicosocial en cuatro empresas. *Gaceta Sanitatia*, 16(3), 222-229. https://scielo.isciii.es/pdf/gs/v16n3/v16n3a02.pdf

Berdegué, J.; Reardon, T.; Escobar, G. and Echeverría, R. (2001). Opciones para el desarrollo del empleo rural no agrícola en América Latina y el Caribe. Banco Interamericano de Desarrollo. https://www.rimisp.org/wp-content/files_mf/135912445224.pdf

Blanch, J. (2003). Trabajar en la modernidad industrial. En J. Blanch (Ed.). *Teoría de las relaciones laborales: Fundamentos* (pp. 19-148). UOC.

Blanch, J. (2011a). Condiciones de trabajo y riesgos psicosociales bajo la nueva gestión. Consejo General de Colegios Oficiales de Psicólogos de España.

Blanch, J. (2011b). Afrontando la nueva gestión pública: obedeciendo y resistiendo. En M. Ferreira (Eds.), *Dominação e resistência no contexto trabalho-saúde* (pp. 81-98). Mackenzie.

Blumer, H. (1969). Symbolic Interactionism: Perspective and Method. Prentice-Hall.

Bruyn, S. (1972). La perspectiva humana en sociología. Amorrortu.

Bryant, D. (1983). A recently discovered amber source near Totolapa, Chiapas, Mexico. American Antiquity, 48(2), 354-357. https://www.jstor.org/stable/280456

Caceda, J. (2016). *Influencia de riesgos psicosociales en salud de trabajadores de compañía minera Santa Luisa S.A.-2015 [Master's Thesis, Universidad Nacional del Centro del Perú].*

Campa, A. (2020). Implicaciones socioambientales de la minería a cielo abierto en Álamos, Sonora [Master's thesis in Integral Environmental Management, COLEF].

Caraballo-Arias, Y.; González-Dos Santos, D.; Porta-González, L. and Pozzobon-Gil, S. (2017). Bachaqueros. Un trabajo del Mercado Negro Venezolano. Ciencia & Trabajo, 19(60), 151-156. https://doi.org/10.4067/s0718-24492017000300151

Carton de Grammont, H. (2009). La desagrarización del campo mexicano. Convergencia. Revista de Ciencias Sociales, 16(50), 13-55. https://convergencia.uaemex.mx/article/view/1250

Cerda, A. (2021). Retos en la extracción, transformación y comercialización del ámbar de Simojovel, Chiapas [Licenciatura Thesis, University of Guanajuato].

Chaparro, E. (2000). La llamada pequeña minería: un renovado enfoque empresarial [The so-called small mining: a renewed business approach]. https://repositorio.cepal.org/bitstream/handle/11362/6446/1/S00060497_es.pdf

Chaparro, E. (2004). La pequeña minería y los nuevos desafíos de la gestión pública. https://www.cepal.org/sites/default/files/publication/files/6436/S043108_es.pdf

Cifre, E.; Salanova, M. and Franco, J. (2011). Riesgos psicosociales de hombres y mujeres en el trabajo: ¿Una cuestión de diferencias? Gestión Práctica de Riesgos Laborales, 82, 28-36. http://hdl.handle.net/10234/73246. http://hdl.handle.net/10234/73246

National Commission for the Development of Indigenous Peoples [CDI] (2016). Indicadores Socioeconómicos de los Pueblos Indígenas de México, 2015. https://www.gob.mx/cms/uploads/attachment/file/239921/01-presentacion-indicadores-socioeconomicos-2015.pdf.

Economic Commission for Latin America and the Caribbean [ECLAC] and Pan American Health Organization [PAHO] (2021), Informe COVID-19 CEPAL-OPS. La prolongación de la crisis sanitaria y su impacto. https://repositorio.cepal.org/bitstream/handle/11362/47301/1/S2100594_es.pdf

Comelli, M.; Hadad, M. and Petz, M. (2010). Hacia un desarrollo (in)sostenible en América Latina. El caso de la minería a cielo abierto en la Argentina. Argumentos, Revista de Crítica Social, 12, 132-157. https://publicaciones.sociales.uba.ar/index.php/argumentos/article/view/882

Cox, T. & Griffiths, A. (1996). The assessment of psychosocial hazards at work. In M. Schabracq; J. Winnubst & C. Cooper (Eds.), Handbook of Work and Health Psychology (pp. 127-146). Wiley and Sons.

Cuff, E.; Sharrock, W. & Francis, D. (1990). Perspectives in Sociology. Unwin Hyman.

De la Cuesta, C. (2006). La Teoría Fundamentada como herramienta de análisis. Cultura de los Cuidados, 20, 136-140.

Del Carpio, P. (2009). De las funciones psicosociales del trabajo artesanal indígena. Asociación Castellano Manchega de Sociología.

Del Carpio, P. (2012). Entre el textil y el ámbar: Las funciones psicosociales del trabajo artesanal en artesanos tsotsiles de La Ilusión, Chiapas, México. Revista Athenea Digital, 12(2), 185-198. https://doi.org/10.5565/rev/athenead/v12n2.1015

Del Carpio, P.; Álvaro, J. and Garrido, A. (2014). Significado del trabajo: aproximaciones teóricas y empíricas. En J. Orejuela (Coord.), Psicología de las organizaciones y del trabajo. Apuestas de Investigación (pp.131-159). Editorial Bonaventuriana.

Del Carpio, P. and Novelo, V. (2019). Mineros y artesanos de la burbuja de mar: Ámbar de Chiapas. *Revista Caderno Profissional de Marketing*, 7(4), 94-113. https://www.cadernomarketingunimep.com.br/ojs/index.php/cadprofmkt/issue/viewIssue/20/3

García E., Medina, G. and Priester, M. (2008). Construyendo consensos en la minería artesanal. Agencia Suiza para el Desarrollo y la Cooperación COSUDE.

Gil-Monte, P. (2012). Riesgos psicosociales en el trabajo y salud ocupacional. Revista Peruana de Medicina Experimental y Salud Pública, 29(2), 237-241. http://www.scielo.org.pe/pdf/rins/v29n2/a12v29n2.pdf

Gómez-Ortiz, V. and Moreno, L. (2010). Factores psicosociales del trabajo (demanda-control y desbalance esfuerzo-recompensa), salud mental y tensión arterial: un estudio con maestros escolares en Bogotá Colombia. *Universitas Psychologica*, 9(2), 393-407. http://pepsic.bvsalud.org/pdf/up/v9n2/v9n2a08.pdf

González-Sánchez, F. and Camprubí, A. (2010). La pequeña minería en México. Boletín de la Sociedad Geológica Mexicana, 62(1), 101-108. http://dx.doi.org/10.18268/BSGM2010v62n1a5

González-Trijueque, D.; Giachero, S. and Delgado, S. (2012). Riesgos psicosociales en el lugar de trabajo: aproximación teórica y marco legal en Uruguay. Ciencias Psicológicas, 6(1), 75-87. https://doi.org/10.22235/cp.v6i1.64

Gorz, A. (1995). Metamorfosis del trabajo. Búsqueda del sentido. Fundación Sistema.

Hernández, R.; Méndez, S.; Mendoza, C. and Cuevas, A. (2017), Fundamentos de Investigación. McGraw Hill.

Hernández, R. and Mendoza, C. (2018). Metodología de la investigación: las rutas cuantitativa, cualitativa y mixta. McGraw Hill.

Hernández, R.; Porraz, I. and Mora, J. (2018). Cartografías migratorias de la población rural chiapaneca. En T. Ramos (Coord.), Ruralidades, cultura laboral y feminismos en el sureste de México (pp. 95-123). UNICACH, CESMECA.

Huenchuan, S. and Guzmán, J. (2006). Economic security and poverty in old age: tensions, expressions and challenges for policy design. Notas de población, 83, 99-125. https://repositorio.cepal.org/handle/11362/12824

National Institute of Indigenous Peoples [INPI] (2016). Indicadores sobre adultos mayores indígenas de México. https://www.gob.mx/inpi/articulos/indicadores-sobre-adultos-mayores-indigenas-de-mexico

Jahoda, M. (1987). Empleo y Desempleo: un análisis sociopolítico. Morata.

Juárez, A. (2007). Factores psicosociales, estrés y salud en distintas ocupaciones: un estudio exploratorio. Investigación en Salud, 9(1), 57-64. https://www.redalyc.org/pdf/142/14290109.pdf

Juárez-García, A., Flores-Jiménez, C. and Pelcastre-Villafuerte, B. (2020). Factores psicosociales del trabajo y en efectos psicológicos en comerciantes informales en Morelos, México: una exploración mixta preliminar". Salud UIS, 52(4), 402-413. https://doi.org/10.18273/revsal.v52n4-2020007

Juárez-Ramírez, C.; Márquez-Serrano, M.; Salgado de Snyder, N.; Pelcastre-Villafuerte, B.; Ruelas-González, M. and Reyes-Morales, H. (2014). La desigualdad en salud de grupos vulnerables de México: adultos mayores, indígenas y migrantes. Revista Panamericana Salud Pública, 35(4), 284-290. https://www.scielosp.org/pdf/rpsp/2014.v35n4/284-290/es

Kánter, I. (2021). Las personas mayores a través de los datos censales de 2020. Mirada legislativa, 204, 1-22.

http://bibliodigitalibd.senado.gob.mx/bitstream/handle/123456789/5295/ML_204.pdf?sequence=1&isAllowed=y

Karasek, R. & Theorell, T. (1990). Healthy Work: stress, productivity, and the reconstruction of working life, Basic Books.

Lara, S. (1998). Nuevas experiencias productivas y nuevas formas de organización flexible del trabajo en la agricultura mexicana. Juan Pablos Editor.

Lara-Rodríguez, J.; Tosi, A. and Altimiras-Martin, A. (2020). Minería del platino y el oro en Chocó: pobreza, riqueza natural e informalidad. Revista de Economía Institucional, 22(42), 241-268. https://revistas.uexternado.edu.co/index.php/ecoins/article/view/6261/8201

Lee Whiting, T. (1991). Tres mil años de artesanía del ámbar en Totolapa, Chiapas. En Anuario 1990 Instituto Chiapaneco de Cultura (pp. 204-217). Gobierno del Estado de Chiapas, Instituto Chiapaneco de Cultura. http://repositorio.cesmeca.mx/handle/11595/297

Lee, T. (2004). *Ámbar de Chiapas. Historia, ciencia y estética.* Gobierno del Estado de Chiapas.

Leff, E. (2009). Pensamiento Ambiental Latinoamericano: Patrimonio de un Saber para la Sustentabilidad. ISEE Publicación Ocasional, 6, 1-15. https://iseethics.files.wordpress.com/2011/03/saps-no-09-span.pdf

Lerín, S. (2004). Antropología y salud intercultural: desafíos de una propuesta. Desacatos, 15-16, 111-125. https://desacatos.ciesas.edu.mx/index.php/Desacatos/article/view/1074/922

Lowe, L. (2004). El ámbar en Chiapas y su distribución en Mesoamérica. UNAM.

Mencía, P. (2016). Historia de la extracción del ámbar en la provincia de Santiago. Impresora RIO.

Moreno, B. (2011). Factores y riesgos laborales psicosociales: conceptualización, historia y cambios actuales. Medicina y Seguridad del Trabajo, 57(1), 4-13. https://xdoc.mx/preview/factores-y-riesgos-laborales-psicosociales5e4d98a2f33d9

Mosquera, C.; Chávez, M.; Pachas, V. y Moschella, P. (2009). Estudio diagnóstico de la actividad minera artesanal en Madre de Dios. CooperAcción, Caritas y Conservación Internacional Perú. http://mddconsortium.org/wpcontent/uploads/2014/11/CooperAccion-2009-Estudio-Diagn%C3%B3stico-de-laActividad-Minera-Artesanal-en-Made-de-Dios.pdf

Narro, J. y Moctezuma, D. (2012). Analfabetismo en México: una deuda social. Revista Internacional de Estadística y Geografía, 3(3), 5-17. https://rde.inegi.org.mx/RDE_07/Doctos/RDE_07_opt.pdf

Novelo, V. (2008). La fuerza de trabajo artesanal mexicana, protagonista ¿permanente? de la industria. Alteridades, 18(35), 117-126. https://alteridades.izt.uam.mx/index.php/Alte/article/view/216/215

Organización Internacional del Trabajo [OIT] (1984). Factores psicosociales en el trabajo: naturaleza, incidencia y prevención. http://www.factorespsicosociales.com/wpcontent/uploads/2019/02/FPS-OIT-OMS.pdf

Organización Internacional del Trabajo [OIT] (1986). Factores psicosociales en el trabajo: reconocimiento y control. OIT.

Organización Mundial de la Salud [OMS] (2017). *La minería aurífera artesanal o de pequeña escala y la salud.* https://apps.who.int/iris/bitstream/handle/10665/259452/9789243510279-spa.pdf;sequence=1

Organización Mundial de la Salud [OMS] (2022). *La salud mental en el trabajo.* https://www.who.int/es/news-room/fact-sheets/detail/mental-health-at-work

Organización de las Nacionales Unidas [ONU] (2018). *¿Por qué la minería artesanal es tan contaminante?* https://www.unep.org/es/noticias-y-reportajes/reportajes/por-que-la-mineria-artesanal-es-tan-contaminante

Pantoja, F. y Pantoja, S. (2016). Problemas y desafíos de la minería de oro artesanal y en pequeña escala en Colombia. *Revista Facultad de Ciencias Económicas: Investigación y Reflexión, 24*(2), 147-161. http://dx.doi.org/10.18359/rfce.2217

Perelman, M. (2021). Antropología del (des)empleo, transformaciones sociales y formas de ganarse la vida en Buenos Aires, Argentina. *Revista Latinoamericana de Antropología del Trabajo*, *5*(10), 1-23. ark:/s25912755/oyfxpeft2

Poinar, Jr. George O. (1992). *Life in Amber*. Stanford University Press.

Pimentel, F. (2009). Cadena productiva del ámbar en Chiapas, México. *Lacandonia, 3*(1), 69-83.

Queiroz, G.; Pires, A.; Da Rocha, G.; Pereira, L.; Freitas, A.; Ferreira, T.; Cardozo, E.; Pires, K.; Pôrto, R. & Barbosa, B. (2019). Effects of environmental noise pollution on perceived stress and cortisol levels in street vendors. *Journal of Toxicology and Enviromental Health, Part A, 82*(5), 331-337. https://doi.org/10.1080/15287394.2019.1595239

Ramos, T. (2018). *Ruralidades, cultura laboral y feminismos en el sureste de México*. UNICACH, CESMECA.

Riquelme, F.; Ruvalcaba, J. y Bucio, L. (2016). *Ámbar y Copal de México.* UNAM.

Riquelme, F. y Ramos, M. (2016). Ámbar de Chiapas. En F. Riquelme; J. Ruvalcaba y L. Bucio (Eds.), *Ámbar y Copal de México* (pp. 30-49). UNAM.

Romero, M. (2017). El significado del trabajo desde la psicología organizacional y del trabajo. Una revisión desde 1930. Psicología desde El Caribe, 34(2), 120-138. https://rcientificas.uninorte.edu.co/index.php/psicologia/article/view/8491

San Martín, D. (2014). Teoría fundamentada y Atlas.ti: recursos metodológicos para la investigación educativa. Revista Electrónica de Investigación Educativa, 16(1), 103-122. https://redie.uabc.mx/redie/article/view/727/906

Soneira, A. (2006). La teoría fundamentada en los datos (Grounded Theory) de Glaser y Strauss. En I. Vasilachis de Gialdino (Coord.), Estrategias de investigación cualitativa (pp. 153-173). Gedisa Editorial.

Soriano, C. (2015). Trabajo infantil, pobreza y minería artesanal. http://repositorio.uigv.edu.pe/bitstream/handle/20.500.11818/994/segundo%20foro_mineria_junio_2015.pdf?sequence=1&isAllowed=y

Sotelo-Suárez, N.; Quiroz-Acentáles, J., Mahecha-Montilla, C. and López-Sánchez, P. (2012). Condiciones de salud y trabajo de las mujeres en la economía informal. Bogotá 2007. Revista Salud Pública, 14(1), 32-42. http://www.scielo.org.co/pdf/rsap/v14s1/v14s1a04.pdf

Toledo, S. (2018). La fiebre del ámbar. La minería en una región agraria. Estudios de Cultura Maya, 51, 197-228. https://revistas-filologicas.unam.mx/estudios-cultura-maya/index.php/ecm/article/view/865

Urán, A. (2013). La legalización de la minería a pequeña escala en Colombia. Letras Verdes. Revista Latinoamericana de Estudios Socioambientales, 14, 255-283. https://revistas.flacsoandes.edu.ec/letrasverdes/article/download/1004/927/

Vieira, R. (2015). Impactos de las Actividades Mineras y de Hidrocarburos sobre los recursos naturales hidrobiológicos del Perú. http://repositorio.uigv.edu.pe/bitstream/handle/20.500.11818/994/segundo%20foro_mineria_junio_2015.pdf?sequence=1&isAllowed=y

Viana, R. (2018). Minería en América Latina y el Caribe, un enfoque socioambiental. Revista UDCA Actualidad & Divulgación Científica, 21(2), 617-637. https://doi.org/10.31910/rudca.v21.n2.2018.1066

Ytuarte-Núñez, C. (2009). Flujos y mudanzas globales del ámbar de Chiapas, México. *Nueva antropología* 22(70), 11-31. https://revistas-colaboracion.juridicas.unam.mx/index.php/nueva-antropologia/article/view/15060/13437

Ytuarte-Núñez, C. (2014). Cultura y comunicación en el intercambio global de mercancías: el ámbar de Chiapas, México. UAM.

PERLA SHIOMARA DEL CARPIO OVANDO
Mexican. PhD and master's in social psychology from the Faculty of Psychology, Complutense University of Madrid. Full-time professor-researcher at the University of Guanajuato, Celaya-Salvatierra Campus, Division of Social and Administrative Sciences, Department of Cultural, Demographic and Political Studies. Research areas: crafts, identities, and labor. Latest publications: Uncertainty, contradictions, and difficulties around the artisanal work of Chiapas amber (2020) and Miners and artisans of the sea bubble: Chiapas amber (2019).