



Universidad del Azuay

Faculty of Law

School of International Studies

**ENVIRONMENTAL IMPACTS OF MINING:
CASE STUDY OF THE TRANSNATIONAL
“LUNDIN GOLD” IN THE NANKAIS SHUAR
COMMUNITY IN ZAMORA CHINCHIPE
BETWEEN 2019 AND 2021**

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DEDICATORY

This degree project is dedicated to my mother for the unconditional support she has given me throughout my life and always encouraged me to keep going despite adversity.

Josseline Gisella Ochoa Fernández

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I am grateful to Senescyt for the economic resources provided throughout my academic training.
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Finally, I thank all the people who collaborated voluntarily for the development of this research project.

Josseline Gisella Ochoa Fernández

DEDICATORY

I dedicate this degree project to my mother for being the unconditional support throughout my life and who for me is an example of womanhood and life.

To my sister, my grandparents, and family, for giving me their support day by day and for being essential pillars in every step of my life.

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Environmental Impacts of Mining: Case Study of the Transnational “Lundin Gold” in the Nankais Shuar Community in Zamora Chinchipe Between 2019 and 2021

ABSTRACT

The socio-environmental impacts caused by mining, in some cases, have had consequences that aggravate the development of indigenous communities and the preservation of the environment. Therefore, the objective of this research is to determine the socio-environmental impacts caused by the mining activity of the transnational company “Lundin Gold” in the Shuar community of Nankais province of Zamora Chinchipe, during the period 2019-2021. Sustainable Development Goals and the national and international norms concerning the Rights of Indigenous Peoples and Nationalities and the Rights of Nature will be taken as a basis. For the purpose, the case study will use a mixed methodology in which semi-structured interviews and retrospective surveys of the Shuar community of Nankais in relation to Lundin Gold's mining activity. Among the main results are lack of job opportunities, population division based on mining activity, violence and crime, health problems, water contamination, depletion of water sources, logging and animal diseases.

Keywords: Socio-environmental impacts, Mining Activity, Sustainable Development, Norms, Shuar Community.

INTRODUCTION

Throughout time, mining has been considered as one of the crucial productive activities within the economy and development of several countries, due to the fact that it generates employment and foreign currency flow; even so, not everything is favorable, since mining activity is developed with mistreatment, abuse, and exploitation of the environment, being some of its most relevant characteristics (Vilela-Pincay, Espinosa-Encarnación & Bravo-González, 2020). However, there is currently a new trend focused on the green economy, the protection of nature and the valuation of cultural identity, which has produced the need to protect the environment, questioning the issues of overexploitation of natural resources. Therefore, the socio-environmental issue is gaining strength to avoid controversies over activities that generate damage to nature and human development. That is why, in terms of environmental sustainability and sustainable business management, the duty of any State is to use natural resources in a responsible way.

In this development scenario, Latin America is betting on extractive activities, where mining is the most significant. Alberto Acosta (2013) mentions that in South American history, extractive processes have caused more damage than benefits. Therefore, with the arrival of transnational and multinational extractive companies in national territories, there has been an increase in poverty, economic crises have intensified, the inhabitants have been pigeonholed in the “search for income”, local societies and communities have disintegrated, and serious damage has been done to the environment. This extractive process has been aggravated by the weakness of democratic institutions in the region, the lack of citizen participation and the deep-rooted corruption that plagues the population.

In the case of Ecuador, Sacher & Acosta (2012) mention that mining companies have a special interest in the country's Amazonian territory because it has great natural wealth. Thus, in this mining scenario, controversies have arisen that have provoked socialist resistance movements, and among these social groups, the most affected are the indigenous peoples (Martínez Espinoza, 2019). In addition, the practice of mining has led to growing tensions between indigenous nationalities, transnational corporations and the Ecuadorian government.

In this context, it is pertinent to review the impact of mining activity in Ecuador in relation to indigenous peoples. Specifically, the research of this article aims to determine the main social and environmental impacts caused by the transnational mining company "Lundin Gold" in the Shuar community of Nankais located in Zamora Chinchipe, based on the concepts of sustainable development and environmental law during the period 2019-2021. The research also seeks to recognize the main socio-environmental impacts that mining activity generates in indigenous peoples and communities in light of international treaties and Ecuadorian regulations. Likewise, the relationship between Lundin Gold and the Shuar community (Nankais) will be identified; and finally, the impact that Lundin Gold generates on the Rights of Indigenous Peoples and Nationalities and Nature as a subject of Law in reference to international treaties and the Sustainable Development Goals (SDGs).

In contribution to the 2030 Agenda for Sustainable Development of the United Nations Organization, the article is linked to several SDGs. Therefore, the article responds to Goals 13 (Climate Action), 15 (Life of Terrestrial Ecosystems) and 6 (Clean Water and Sanitation), since it will analyze how this productive economic activity generates impacts on the environment and whether or not it contributes to increasing climate change. At the same time, the social impact will be analyzed, which responds to Objectives 1 (End of Poverty) and 10 (Reduction of Inequalities), since the aim is to identify whether the mining project really generates sustainable development in relation to the directly related community. In addition, it responds to Objective 8 (Decent Work and Economic Growth), since reference will be made to the economic impacts caused by the mining practice in the studied community.

OBJECTIVES

General Objective:

Determine the main socio-environmental impacts caused by the transnational mining company "Lundin Gold" in the Shuar community of Nankais, based on the concepts of sustainable development and environmental law during the period 2019-2021.

Specific objectives:

1. To recognize the main social and environmental impacts that mining activity generates on indigenous peoples and communities, based on international treaties and Ecuadorian regulations.
2. Identify the relationship between the transnational company Lundin Gold and the Shuar Nankais Community in the Zamora Chinchipe Province.
3. Determine the impact generated by the mining activity of Lundin Gold on the Rights of Indigenous Peoples and Nationalities and Nature as a subject of Law, taking as a reference international treaties and the Sustainable Development Goals.

THEORETICAL FRAMEWORK AND STATE OF THE ART

1. The environmental crisis and global environmental concerns.

Social changes and economic advances that humanity has experienced, in recent decades, have been the main causes of environmental degradation (Universidad Nacional Autónoma de México, 2008); it means that activities that humans have developed for their survival have drastically modified the structure and functioning of the different ecosystems (Marín-Muñiz, Hernández Alarcón, Silva Rivera & Moreno-Casasola, 2016). Thus, according to Enrique-Mirón, Cabo-Hernández & Mohamed-Abderraman (2012), such environmental damage can be evidenced in desertification, the extinction of multiple species, water pollution, resource depletion, atmospheric pollution, a new disease appearance, and the destruction of cultural heritage. In addition, it must be considered that environmental problems are multi-causal, and are caused by different factors, such as ecological, social, economic, cultural, political, ethical, and so on (Álvarez & Vega, 2009). Therefore, the International System focused its efforts on overcoming the global environmental crisis threat by establishing a global policy agenda promulgated at the United Nations Conference on the Human Environment in Stockholm in 1972 (Estenssoro Saavedra & Vásquez Bustamante, 2018). Modern Environmental Law was initiated in this Conference, with a weak anthropocentric vision from which it proposes to protect nature to protect human life (Gómez & León, 2016). Subsequently, in 1983, the UN decided to create the World Commission on Environment and Development (WCED), aimed to seek a consensus formula between development and environmental perspectives to reinstate the issue of overcoming the environmental crisis on the political agenda (Estenssoro Saavedra & Vásquez Bustamante, 2018). In 1987, the WCED issued the report *Our Common Future*, "Brundtland Report", with the concept of sustainable development (López Pardo, 2015). In 1992, in Rio de Janeiro, this concept of sustainable development, the United Nations Conference on Environment and Development, also known as the "Earth Summit" (Rio-92) was the most successful world conference. This Summit aimed to generate instruments and commitments to overcome the environmental crisis (Estenssoro Saavedra & Vásquez Bustamante, 2018). It adopted 27 principles to achieve a balance between environmental limits, economic and productive activity, and the satisfaction of human needs (Guimaraes, 1992). After multiple conferences, environmental issues were included in global and national public policies (Lezama, 2011). In addition, environmental risk was considered as a situation of potential danger that directly affects "natural resources in an ecosystem; considering malformations and/or mortality in flora and fauna, contamination of water courses, deforestation, drought, etc., as environmental damage. (Schmidt, Toledo López, Tobías, Grinberg & Merlinsky, 2022). Hence, present environmental crises have been characterized by two areas of research (Cabello, Torres & Medallo, 2018); first, environmental

disasters caused by nature (Thomas, Friedman, Brandt, Spencer & Tanner, 2016); second, environmental disasters caused by human activities and their productive processes (Houston, Pfefferbaum & Rosenholtz, 2012) such as deforestation, the depredation of non-renewable fossil fuels, the misuse and exploitation of renewable resources, the use of heavy machinery for exploitation, and above all, formal and informal mining. (Reynosa Navarro, 2015).

2. Mining and the Global Environmental Consequences

a. Global Mining

Mining is considered as an “economic activity, which encompasses the process of extraction, exploitation and use of minerals found on the earth's surface for commercial purposes” (Banco Central del Ecuador, 2015). The term mining also consists of the requirement to implement mining techniques or the use of explosives that are essential for the treatment of the minerals extracted, such as: milling, categorization by size, washing, concentration, among others, with the objective of making these substances available for trade (Gobierno de España, 2020). In this way, Cante & Trujillo (2014) mention that in the market there are consumers with a desire to acquire minerals, and governments or private actors do not hesitate to carry out mining activity in order to acquire maximum profitability.

There are different ways of mining, so the Banco Central del Ecuador (BCE) (2015) mentions that there are six types of mining: Underground Mining, Surface mining, Alluvial Mining, Wall mining, Drilling well mining and Underwater or dredging mining.

- *Underground Mining*, is developed inside the earth by exploitation through tunnels (vertically or horizontally).
- *Surface Mining*, due to the shallow depth of the minerals, is developed in layers and there is no need for internal exploitation.
- *Alluvial Mining*, refers to the extractive activities that are carried out in riverbeds or on riverbanks
- *Wall Mining* is the exploitation of coal in vertical strips.
- *Drilling well Mining*, this type of exploitation, focuses on the extraction of oil or gases.
- *Underwater or dredging Mining*, this is found in the ocean or in rivers (BCE, 2015, p. 1).

By exploiting mineral resources, the material aspect of the "buen vivir"¹ can prevail over the effort to conserve and preserve nature (Vásconez & Torres, 2018). Thus, Witker (2021) in the second edition of his book *Derecho Minero* refers to the fact that five phases must be present in any mining Project:

1. *Prospecting*, is where geological, geophysical and geochemical studies are identified or carried out in places that are candidates for the exploitation of deposits, veins or rocks with mineral substances.
2. *Exploration*, a phase that requires authorization and permits for the monitoring process after possible signs of mining substances.
3. The *exploitation* phase is when the mining project starts the extractive activity, which should gradually measure the socio-environmental impacts caused by the mining project.
4. The *benefit* of the mining project.
5. Finally, in the *gradual process of closing the project*, the consequences caused by the company that carried out the extractive activities in the area and its surroundings must be prioritized, foreseen and ensured under responsibility (Witker, 2021, p. 18-19).

Acosta (2013) mentions that in modern industrial mining seeks to exploit mineral resources in the shortest time possible, generating depletion of minerals in these deposits; in addition, this activity requires abundant amounts of chemicals and water, which generates considerable amounts of highly dangerous waste for life. Specifically, for example, in the case of gold refining and mining, it is necessary to use

¹ Buen Vivir is a concept based on the 'Sumak Kawsay' and is a constitutional principle that compiles the vision of the world focused on the human being as a component of the social and natural environment (Ministerio de Educación Ecuador, n.d.).

mercury and lead, highly toxic substances, responsible for producing great pollution worldwide (Oviedo-Anchundia, Moina-Quimí, Naranjo-Morán & Barcos-Arias, 2017).

Living in a globalized world, mining production, according to Concha (2017) comprises 70% by Australia, Bolivia, Brazil, Canada, Chile, China, Korea, United States of America, India, Indonesia, Japan, Mexico, Peru, Russia and Turkey. These countries adjust to the capitalist format that includes large-scale production, accumulation, waste and expropriation (La Rotta & Torres, 2017). By participating in the world market, mining activity has become one of the crucial productive operations within the economy and development; being the mistreatment, abuse and exploitation of nature and the environment some of its visible characteristics (Acosta, 2016). Rodríguez, Oldecop, Linares & Salvadó (2009) in their research on The great disasters produced by mining-metallurgical activity worldwide, mention a particular case, which is the Ok Tedi² mining disaster in 1980 in New Guinea. This pollution problem included the concentration of copper in surface water, which covered 1,300 square kilometers of this discharge, affecting more than 50,000 people, and this whole problem was caused by poor environmental management, resulting in social and environmental damages. (Rodríguez et al., 2009). In view of this aggravation on the health of people and the environment, mining extraction must be carried out respecting the environmental panorama and identifying controversies that may arise in the established territory (Viana, Velázquez & Pérez, 1999). Indeed, mining extractive activity is an agent to be considered in environmental, economic and commercial policy (Witker, 2021).

b. Mining in Latin America

Thanks to the abundant biological wealth, Latin America has become the center for extractive activities in the region, where mining is one of the most relevant operations (Martínez, 2019). Mining in Latin America has traditionally been linked to colonization, capital accumulation and the expropriation of peoples and territories (Solíz, 2016). According to Quijano & Huapaya (2021), mining has not stopped developing and growing in Latin America in recent decades, but has transformed and adapted to remain in force. Thus, the United Nations Economic Commission for Latin America and the Caribbean (ECLAC) found that mineral extraction in Latin America increased six times more since 1970, from 659 million tons to 3972 million tons in 2017 (Bárcena, 2018). Historically, there have been continuous social conflicts of indigenous movements with transnational mining companies and governments for the demand of their legitimate rights, such as free, prior and informed consultation, the safeguard of land possession and self-identification as indigenous peoples and nationalities in reference to Convention 169 of the International Labor Organization (ILO) (López Bárcenas & Eslava Galicia, 2011). Mining activities present significant environmental challenges, especially in Latin American countries that lack rigorous environmental standards to prevent or mitigate potential environmental alterations (Vela-Almeida, León & Lewinsohn, 2021). In the search for solutions to these problems, since 1990 Latin countries have adopted new regulations and sought new reforms to mining legislation, modifying them towards a mining legal framework that provides ‘legal certainty, and that guarantees investment and attractive business’ to transnational companies (Rights and Resources Initiative & Environment Society Partnership, 2013, p. 4.). However, despite the fact that the countries of the region are facing these conflicts, even though they adopt policies that promote development in the mining sector, they still do not provide spaces in which management can be agreed with civil society (Cisneros, 2016). Mining companies, in their effort to strengthen this sector, have assumed social responsibility policies, which seek to change this notion of the communities towards these mining projects, thus reflecting their influence on the standard of living and community development (Viana Ríos, 2018). In any case, attention to the conflicts generated by mineral extraction, both by the government and mining companies, has resulted in increased criminalization, repression and aggression (OCMAL, 2019). Thus, one of the relevant conflicts that arose in 2013 in Latin America is the case in Colombia of the murder of Adelinda Gómez, a human rights defender and peasant leader. Gómez was against large-scale mining led by Almaguer Cauca³, where copper, gold and coal are extracted, an activity that caused sinkholes and serious effects on the biological and water resources of the

² Ok Tedi Mining Ltd. is one of the oldest companies in Papua New Guinea and is engaged in open-pit copper, gold and silver mining.

³ Mining developed in Almaguer Cauca is illegal and affects indigenous peoples (Munchique Los Tigres indigenous group and Canoas indigenous group) located in the territory of the municipality of Santander from Quilichao and Caldono (Environmental Justice Atlas & Pérez, 2019).

region (Amnesty International, 2013). Gómez's anti-mining stance ended in impunity due to the presumption that the main actor in the crime was one of the mining companies that Gómez opposed. Thus, in addition to this conflict, the result of mining projects to date has left criminalization of activists, deaths, institutional modifications, repression, violence against activists and lack of enforcement of existing regulations (Environmental Justice Atlas & Perez, 2019).

c. Mining in Ecuador

In the mining scenario, Ecuador is one of the most recent participants in the Latin American context (Sánchez-Vázquez, Leifsen & Verdú, 2017). The contribution of mining to the country was economic growth, as well as the implementation of policies and laws aimed at keeping the impact of this activity on the environment as low as possible (Mestanza-Ramón, Paz-Mena, López-Paredes, Jiménez-Gutiérrez, Herrera-Morales, D'Orio & Straface, 2021). However, both the government and the private sector present the option of large-scale mining that is developed in an environmentally responsible manner, but in the process fails to deliver (Sánchez-Vázquez, Espinosa & Eguiguren, 2016).

In recent years, mining has intensified its development in the north of the country, in the provinces of Sucumbios, Orellana and Napo, and in the south in Morona Santiago and Zamora Chinchipe (Mestanza-Ramón, Cuenca-Cumbicus, D'Orio, Flores-Toala, Segovia-Cáceres, Bonilla-Bonilla & Straface, 2022). Sacher & Acosta (2012) in their book *Large-scale mining in Ecuador (La minería a gran escala en Ecuador)* point out that transnational and multinational mining companies have a special interest in Ecuadorian territory, but especially in the Amazon for its great natural wealth. For example, Canadian diplomacy influences Ecuador's policies and Canadian mining concessions enjoy this unilateral benefit. Before the 2008 Mining Mandate⁴, the mining concession territory of the transnationals included protected forest areas and regions, indigenous territories, archaeological sites, agricultural lands, and even urban areas. Thus, the absence of participation in decision-making by the communities, the government inconsistency, together with the lack of control in the mining activity, are aspects that affect the inefficient development of environmental policies in the mining sector (Mestanza-Ramón et al., 2022). The implementation of large-scale mining brings impacts such as: creation of access roads, setting up camps, land and hydrogeological studies, digging of trenches and wells, among others; in addition, the consequences of environmental impact are varied, for example: deforestation, surface wear, water use, contamination and loss of biodiversity (García, 2016). The last decade for Ecuador has been full of unstable processes that have induced indigenous groups, peasants and different social actors to express their discontent with inoperative national policies, demanding change and regulatory modifications to ensure the "buen vivir" that the country deserves (Eguiguren & Jiménez, 2011).

3. The Socio-environmental Conflicts Generated by Mining

a. Global

The degradation of nature, people's health problems, scarcity of food, water, raw materials and an increase in the incidence of natural disasters have increased concern for environmental issues at a global level (Alaña Castillo, Capa Benítez & Sotomayor Pereira, 2017). Effects of mega-mining on the environment are highly detrimental since hazardous quantities of chemical and corrosive substances, explosives, and fuels are released, during the extractive process (Moran, 2013). For this reason, pollution, degradation, and expropriation of natural resources are inevitable (Martínez Epinoza, 2019). Water sources are exhaustively exploited due to a large amount of water required for mining since from the beginning to the end of the operation, at least one cubic meter of water per second is needed uninterruptedly (Machado, 2010). Also, to separate the precious metals from the rock, arsenic, mercury, cyanide, copper, sulfur,

⁴ The National Constituent Assembly of Full Powers, in 2008, issued Constituent Mandate Number 6, with the purpose of controlling the mining sector in order to prevent environmental, social and cultural impacts; it was also a political-legal result of social demands and demands against large-scale mining (Comisión Ecueménica de Derechos Humanos, 2016).

uranium, and lead are used; these heavy metals infect the water sources due to their high toxicity; the water becomes unusable for any other activity and even uninhabitable for aquatic life (Moran, 2013).

b. Latin America

In the case of Latin America, according to ECLAC data, in recent years there has been a “re-primarization” of exports (ECLAC, 2019). It means that Latin America has become increasingly dependent on metals; therefore, it suffers the consequences of extractive industries, such as environmental deterioration and scarce productive diversification; this directly affects the social environment due to displacements and productive backwardness in other economic activities. In addition, it should be mentioned that high revenues from extraction tend to encourage inefficient investments and corruption. The “resource curse”⁵ causes harmful impacts on the social aspect due to the development of political opportunism, violent social conflicts, low rates of human development, and a constant state of uncertainty (Quijano & Huapaya, 2021).

Open-pit mining also destroys large extensions of mountainous areas (Machado, 2011). The soil is removed and deteriorated by spills of toxic materials; the sedimentation of contaminated dust, thus losing its basic functions. The air is polluted by gases (carbon, nitrogen, and sulfur oxides), increased vapor emissions, noise levels, particulate matter, and heavy metals (Rights and Resources Initiative & Environment Society Partnership, 2013). All of this causes negative impacts on the production and quality of food of agricultural, livestock, marine, or forestry origin; and violates the food sovereignty of some local communities (Martínez Espinoza, 2019). It also impacts native species, forcing them to move or disappear (Rights and Resources Initiative & Environment Society Partnership, 2013). Also, they harm the health of local people; with respiratory, gastrointestinal, dermatological, endocrine, cardiovascular, or neurological diseases (González, 2015). In addition, mining activity has violated the right to use water resources and natural assets intended for the inhabitants (Martínez Espinoza, 2019); furthermore, economic factors are the ones that determine socio-environmental conflicts to a greater extent (Ruiz Morales, 2021).

The problems caused by extractive industry projects in indigenous territories can be identified in six nodes:

1. *Problems due to inadequate or non-existent legal protection* of the rights of indigenous peoples over their natural resources, lands, biodiversity, water, and territoriality.
2. *Conflicts due to the violation of indigenous peoples' sacred sites.*
3. *Ineffective or non-existent evaluations* that determine the environmental, social, territorial, and economic impacts of extractive projects.
4. *Omission of the State's duty to consult* with indigenous peoples and to adopt the necessary safeguards and measures to protect their rights before granting concessions for extractive projects.
5. *Indigenous peoples do not enjoy the benefits* derived from the exploitation of resources in their territories.
6. *Indigenous social protests* against investment projects that affect their rights and territory are criminalized (ECLAC, 2014).

With regard to socio-environmental conflicts, it is important to take into account the population's perception of them, since environmental issues can provoke different forms of conflict depending on the local socioeconomic and cultural context (Sánchez-Vázquez et al., 2017). The population groups most affected by extractivism, as mentioned above, are the indigenous peoples, to the point of being considered the main cause of their mobilizations in the last decade (ECLAC, 2014).

In Latin America, mining conflicts amount to 284 cases, of which 9 have been reported in Ecuador and are socio-environmental conflicts that violate the right to a healthy environment, produce pollution and degrade productive resources (OCMAL, 2020).

⁵ The “resource curse” or the “paradox of abundance” is a theory that relates abundance to the development of countries and refers to countries with abundant natural resources having lower economic and social development as opposed to countries with fewer resources (Di Paola, 2019).

c. Ecuador

Ecuador has had a long history of mining, dating back to colonial times, which has focused on the southern provinces of the country (Latorre, Farrell & Martínez-Alier, 2015). Ecuador's intergenerational responsibility for this extractive activity involves the administration of non-renewable resources and demands that the governments in power develop prudent management within a framework of transparency and accountability (Caamaño, Merchán & Díaz, 2019). However, during the government of Rafael Correa⁶, large-scale mining concessions were given to several transnational companies, many of them within protected areas and territories of peasant and indigenous communities (Velásquez, 2012); proclaiming large-scale mining as a facilitator of good living (Van Teijlingen, 2016). In many cases in the Amazon, local communities showed resistance to mining activities because they considered that it brings severe socio-environmental impacts and many risks (Espinosa, 2021).

Within this context, it is important to mention some studies carried out in the Ecuadorian Oriente whose central theme is socio-environmental conflicts derived from mining. Thus, in the case study carried out in the parish of Puerto Napo and the Río Napo⁷ regarding environmental conflicts in the year 2020, four indicators were taken into account:

1. *Poor environmental quality*: Deteriorated due to increased riverbank erosion, noise, and annoying vibrations.
2. *Socio-cultural conditions*: Dissatisfaction concerning income and employment opportunities, given the nearby mining activity.
3. *Political participation and democratic quality*: Dissatisfaction with the work of the authorities and dissatisfaction with the quality of public services and the management of public institutions.
4. *Factor of alteration of pre-existing relationships*: It is alarming due to generalized dissatisfaction; because the action of mining alters the pre-existing relationships between a community and its environment, or vice versa; this affects employment opportunities (Ruiz Morales, 2021).

On the other hand, in a study conducted on the perception of socio-environmental conflicts in mining areas, executed in the Pangui canton in the parishes of Pachicutza, El Guismi and Tundayme⁸ in 2016, part of the Mirador Project. **Table 1** shows the main social, economic and environmental conflicts and socio-environmental impacts caused by mining within the Mirador Project (Sánchez-Vázquez et al., 2016).

Table 1

Socio-environmental Conflicts and Impacts of the Mirador Project

Social	Economic	Environmental
<ul style="list-style-type: none"> ● Population division ● Domestic violence ● Alcoholism in adolescents ● Drug addiction with contact cement ● Relocation ● Early pregnancy ● Lack of transportation in rural neighborhoods and the Shuar community. ● Lack of socialization of the 	<ul style="list-style-type: none"> ● Labor dependency ● Migration ● Crime ● Economic dependence on mining ● Wage insufficiency 	<ul style="list-style-type: none"> ● Water pollution ● Burning of inorganic waste ● Loss of forests ● Desertification ● Land unsuitable for cultivation ● Decrease in agriculture ● Depletion of water sources ● Plague/Animal diseases

⁶ Rafael Correa's administration began in January 2007 and culminated in May 2017.

⁷ The study area includes the parish of Puerto Napo, belonging to the province of Napo, canton Tena. The type of mining practiced in this area is alluvial gold exploration and exploitation; the same that is executed by the company Terraeath Resources S.A, since 2017, which has the Regina 1S concession in this territory (Ruiz Morales, 2021).

⁸ The mining activity is located southeast of the province of Zamora Chinchipe, canton El Pangui, parish Tundayme; the Ecuacorriente mining company (ECSA S.A.) is responsible for the Mirador Project, where large-scale open-pit copper mining has been practiced since 1994, being in 2019 the start of its large-scale operations (Sánchez-Vázquez et al., 2016).

-
- Land Use Plan (Plan de Ordenamiento Territorial - PDOT)
 - Massive purchase of land by the mining company
-

Note: the table shows the socio-environmental conflicts and impacts of the Mirador Project.

Source: Adapted from Sánchez-Vázquez et al., 2016, p. 35.

In this context, according to the Fundación Regional de Asesoría en Derechos Humanos (INREDH) (2016) in Tundayme parish, part of the Mirador project, three evictions of inhabitants were carried out within the project in question, making it evident that the rights of mining concessions are above human rights. According to Eguiguren, Reyes, Espinosa, Vera, Puchaicela & Luzuriaga (2018), the communities located in Zamora Chinchipe in the Conguime community of the Paquisha canton⁹; point out that mining is responsible for affecting water resources, soil erosion, and air pollution; although, this activity is the main source of their economic income.

Another of the most notable conflicts in this trajectory is the socio-environmental conflict of “Rosa de Oro” that is located in the Pananza parish, San Juan Bosco canton in the province of Morona Santiago (Eguiguren & Jiménez, 2011). The mining company in charge of the exploration and exploitation of this territory is Explorecobres S.A, which began operations in 2010; the mining activity carried out by this company is mainly open-pit copper. The problem is based on the clash of interests, positions, and needs to be related to the management of threatened natural resources in the area. This conflict speaks to the inequity and exclusion of state institutions and public policies that privilege the private sector in terms of the use, access, and control of natural resources, ignoring the needs of the communities where extractive mining projects are located. Mistrust towards the actions of the state is also mentioned as a problematic factor, as they see it as strange and distant, they consider that rights are only written on paper since the construction of the regulations were not previously consulted. There is also talk of distrust of the mining company; people argue that there is no clear or adequate information about the real risks of this activity and that the environmental and social impacts are not presented. The community is concerned about the excessive use of water, the drastic reduction of forest resources, the lack of sustainable local development, the lack of new sources of employment, the impoverishment of the population, and the displacement to activities foreign to their culture, which could even mean the extinction of the Shuar people in this area (Eguiguren & Jiménez, 2011).

In Ecuador, indigenous communities are the most affected by extractive activities. It is estimated that up to 15.6% and 18.4% of indigenous people from Shuar communities are affected by the mining and oil industry, respectively (Izko, 2012). Paradoxically, this reality coexists with the national and international right of indigenous communities to be part of decisions and activities that involve the affectation of their lands (Sánchez-Vázquez et al., 2017). Ultimately, the point where all these conflicts converge is the defense of territory and action guided by indigenous peoples' cultural values (Fontaine, 2009).

4. International and national regulations for environmental protection and indigenous peoples and nationalities

The rights of indigenous peoples are debated in a sphere of resistance and struggle, which entails different objectives: the visibility of their conflicts, recognition of their needs and way of life through the establishment of both international and national legal standards, set as rights in political and legal praxis (Cervantes, Hernández & Burgos, 2017). Indigenous peoples and their rights were marginalized for a long time and did not constitute an international concern (Ayliwn, Meza-Lopehandía & Yáñez, 2013) until the

⁹ The mining activity is located in the south of the Province of Zamora Chinchipe, Paquisha canton, Nuevo Quito parish, Conguime community; the modality of mining carried out in this sector is alluvial or open-pit mining, which is generally preceded by illegal miners; although in 2016 the company Exploren Minería S.A. began its mining activities in this area (ENAMI EP, s.f.).

International Labor Organization (ILO) adopted 1989 international standards on the rights of indigenous peoples (Quijano & Huapaya, 2021). This trigger in the international panorama generated changes in the situation of indigenous peoples in all regions of the world, with which, it is “advisable to adopt new international standards on the matter, to eliminate the orientation towards the assimilation of obsolete standards” (Cervantes et al., 2017). Likewise, one of the major changes in Latin America is the formal recognition of nature and indigenous peoples in the region in their national constitutions (Fuentes & Cea, 2017). Thus, in the Ecuadorian case, both nature and indigenous peoples enjoy fundamental rights (García, 2019). **Table 2** details the most relevant international and national regulations regarding environmental protection and the recognition of the rights of indigenous peoples.

METHODOLOGY

The research purpose is to determine what social and environmental impacts the mining company Lundin Gold has caused in the Shuar community of Nankais between 2019 and 2021. The research will be performed through a qualitative and quantitative methodology. On the one hand, the research work lies in a case study proposed by Robert K. Yin (2014), who describes a case study as a qualitative methodological strategy that serves as an instrument to conduct research and that its validation lies in measuring and recording human behavior in the circumstances studied. Additionally, it will focus on description and understanding from a cultural ethnographic approach where the authentic nature of human realities will be closely studied (Hernández-Sampieri, Fernández Collado & Baptista Lucio, 2014). Furthermore, in the case study, Chetty (1996) mentions that information could be acquired from varied sources that record qualitative or quantitative methodology, such as through documents, archives, interviews, observation, etc. For this reason, the proposed research presents a literature review of primary and secondary documents that will generate a theoretical framework from which semi-structured interviews, opinion, knowledge, and background interviews (Mertens, 2010) are developed in order to find what have been the main impacts generated by Lundin Gold's mining activity for the Shuar community of Nankais according to the perspectives of the interviewees (*Annex 1*).

Likewise, a quantitative methodology will be used, which according to Hernández-Sampieri & Mendoza (2018) is appropriate when one wants to evaluate the magnitudes or occurrences of phenomena and test assumptions. Thus, the quantitative part is characterized by being objective, deductive, using inferential statistical data, and having the control of variables studied to reach generalities based on the findings (Bonilla-Castro & Rodríguez, 2005). Therefore, the other approach adopted by this work is the collection and analysis of data, with reliability in numerical measurement, to answer the research question posed. The impacts identified in the literature will be contrasted with the standard of living of the community about the mining transnational through retrospective surveys with open and closed questions (*Annex 2*). Through the surveys, the level of satisfaction with the activity of the mining company, occupation of the respondent, financial stability, health, and the development of the environment in which they live will be identified. Therefore, the surveys will be conducted through non-probabilistic sampling with the Likert Scale, to 41 inhabitants of the community, since it is a descriptive analysis; focusing on those who know about the mining activity of Lundin Gold, taking into consideration the age of 18 to 55 years, to determine what have been the most significant changes in their lives, referring to the base theme, which is the environmental and social impacts of mining.

Table 2*International and national regulations for the protection of the environment and indigenous peoples and nationalities*

Type of Norm	Name	Objective	Commentary / Critique
International Treaty	Convention 169 of the International Labor Organization (ILO) concerning Indigenous and Tribal Peoples	<p>Convention 169 ensures the right of indigenous and tribal peoples to express their preferences insofar as this “affects their lives, beliefs, institutions and spiritual well-being, and the lands they occupy or use, and to control, as far as possible, their own economic, social and cultural development” (ILO Convention 169 concerning Indigenous and Tribal Peoples in Independent Countries, 2014).</p> <p>In addition, basic welfare that contemplates and is articulated in five dimensions must prevail:</p> <ol style="list-style-type: none"> 1. Right to development and social welfare; 2. Right to cultural integrity; 3. Right to ownership, access, use, and control of lands, territories, and natural resources, 4. Right to political participation 5. Right to free, prior, and informed consultation (ECLAC, 2014). 	<p>In Latin America, ILO Convention 169 has had several repercussions where indigenous peoples show deficiencies in labor and socioeconomic indicators (Cosi Villalva de Chirinos, 2021).</p> <p>There are continuous social conflicts between indigenous movements, transnational companies, and government; due to the claim of legitimate rights (Mestanza-Ramón et al., 2021); despite the guarantee of collective human rights guaranteed by this Convention, in the face of mining projects established in certain territories (Rivera-Parra, Beate, Díaz & Ochoa, 2021).</p>
International Instrument	United Nations Declaration on the Rights of Indigenous Peoples and Nationalities (UNDRIP)	<p>The Declaration must safeguard indigenous peoples through the recognition of the rights of collective exercise imperative to human rights (Martínez Espinoza, 2015).</p> <p>It recognizes the right to self-determination, and in turn, establishes the minimum standard of rights of indigenous peoples (mandatory for States) in five dimensions:</p> <ul style="list-style-type: none"> ● Right to non-discrimination; ● Right to development and social welfare; ● Right to cultural integrity; ● Right to ownership, access, use, and control of lands, territories, and natural resources, ● Right to political participation and free, prior, and informed consent (ECLAC, 2014). ● Right to autonomy and determination, freedom in their social, political, economic, and cultural development; and do not require authorizations or prohibitions by the State (Mena & Silva, 2019). 	<p>This recognition is not a concluded matter in the framework of International Law, as it is in a phase of transition from a Western-centric state system to one based on human rights and the plurality of cultures (Martínez Espinoza, 2015).</p>
		<p>The most important articles are 8, 10, 26, 26, 29, and 32, which talks about the right</p>	

that indigenous people have:

- Not to be subjected to forced assimilation or the destruction of their culture;
- Not to be forcibly displaced;
- The right to their lands and resources, as well as to control and develop them;
- Right to the conservation and protection of the environment and the productive capacity of their lands;
- The responsibility of the State to consult and obtain their free and informed consent before allowing the entry of any project that uses or exploits mineral, water, or other resources, as well as to provide them with legal and juridical guarantees to help them guarantee their rights (UN, 2007).

International Instrument	United Nations (UN) Resolutions on Indigenous Peoples	<p>UN resolutions provide a space in which States, UN agencies, funds and programs, together with indigenous peoples, will assess the progress and challenges of UNDRIP implementation at all levels (Department of Economic and Social Affairs, n.d.).</p> <p>The adoption in 2007 of UNDRIP Resolution 61/295 brought about the outcome of more than 20 years of rigorous negotiations and efforts, and was set in motion by solidarity and cooperation among governments, indigenous peoples, non-governmental organizations (NGOs), academia and parliamentarians, etc (UN Inter-parliamentary Union, UN Agricultural Development Program & International Development Fund, 2014).</p>	<p>The sessions of the resolutions on indigenous peoples are based on participation, where the progress made, and the difficulties faced by indigenous peoples at the United Nations are analyzed and examined, and the speakers are encouraged to contribute with concrete methods to advance the debate (Department of Economic and Social Affairs, 2021).</p>
International Instrument	American Declaration on the Rights of Indigenous Peoples	<p>The American Declaration on the Rights of Indigenous Peoples recognizes the importance of the presence of indigenous peoples for the development, plurality, and cultural diversity of the societies of the continent; despite the historical injustices they have experienced (Añaños & Hernández, 2021).</p> <p>Articles 3, 6, 29, and 34 allude to the political rights of indigenous peoples and their ability to access measures to mitigate different adverse impacts; in addition to recognizing their right to health, to their territory and resources, and to a healthy and sustainable environment in Articles 13, 19 and 25 (OAS, 2016)</p>	<p>During the construction process and until the end of the elaboration of the Declaration, OAS member states such as Brazil, Canada, Colombia, and the United States disagreed on the articles related to self-determination, consultation, and consent, natural resources, lands, and territories; for this reason, they included some observations in these articles (Añaños & Hernández, 2021).</p>
National Supreme Norm	Ecuadorian Constitution	<p>The Constitution provides a set of basic principles and rules that allow for a minimum of coordination among the members of a society (Millaleo, 2019).</p> <p>Articles 10 and 11 of Chapter I of Title II of the Constitution establish as rights holders (i) individuals, (ii) communities, (iii) peoples, (iv) nationalities, (v) collectives and (vi) nature. (Constitución de la República del Ecuador, 2008).</p> <p>Article 14 mentions that the population has the right to live in a healthy and</p>	<p>In the Ecuadorian State, nature has rights, which implies that it is protected as an entity in its own right and not only as a means to satisfy human needs (Gómez & León, 2016).</p> <p>In spite of the declarations established in the Constitution, there are multiple disagreements among the Shuar peoples of the province of</p>

ecologically balanced environment, where sustainability and the ‘buen vivir’ (sumak kawsay) are guaranteed; in addition, the preservation of the environment, the conservation of ecosystems, biodiversity and the integrity of the country's genetic heritage, the prevention of environmental damage and the recovery of degraded natural spaces are declared to be in the public interest (Constitución de la República del Ecuador, 2008).

Art. 395 addresses development from a sustainable development model and the cross-cutting application of policies related to environmental management; it also mentions the active and permanent participation of affected communities and peoples when there are environmental impacts.

Likewise, Art. 57 recognizes the rights of indigenous nationalities, peoples, and communities and establishes:

- Art. 57.4 recognizes the inalienability and indivisibility of community lands.
- Art. 57.6 grants the communities the administration and conservation of natural resources found on their lands.
- Art. 57.7 mentions free, prior and informed consultation, where the authorities have the obligation to do so.
- Art. 57.8 mentions the conservation of their biodiversity management practices.
- Art. 57.12 refers to the right to maintain and protect collective knowledge and ancestral knowledge.
- Art. 57.21 refers to respecting peoples in isolation; as well as prohibiting extractive activities in their territories (Constitución de la República del Ecuador, 2008).

Articles 396 to 415 mention strict liability for environmental damage, control and management of environmental impacts, policies in protected areas and citizen consultation (Constitución de la República del Ecuador, 2008).

National
Environmental
Norm

Organic Environmental
Code (CODA)

The Code guarantees the right to live in a healthy and ecologically balanced environment, where the rights of nature are protected; it also regulates the different rights, duties and environmental guarantees mentioned in the Constitution (ECLAC, 2018).

The Code mentions eight important dimensions of the right to information:

1. Right to Information (Art. 3,9,19 and 218)
2. Right to Participation (Art. 5.10)
3. Participation in environmental policy and programs (Art. 8, 15, 16, 18 and

Zamora Chinchipe, where the rights of nature are violated by the Ecuadorian State following mining projects (Lewis, 2016).

With CODA, the exercise has just begun, since there is a lack of coordination schemes by both the National Environmental Authority and the decentralized governments so that these actions are included in the Development and Land Use Plans to be efficient and protect the rights of Nature (Martínez, 2019).

		225)	
		4. Liability for environmental damage (Art. 8, 9, 10 and 11)	
		5. Protection of Biodiversity (Art. 30, 48, 101 and 153)	
		6. Evaluation of activities or projects (Art. 163, 177, 179, 184 and 185)	
		7. Climate change (Art. 248 and 251) (ECLAC, n.d.).	
National Environmental Norm for the Mining Sector	The Mining Law	<p>The Mining Law “regulates the exercise of the sovereign rights of the Ecuadorian State to administer, regulate, control and manage the strategic mining sector in accordance with the principles of sustainability, precaution, prevention and efficiency” (Ley de Minería, 2009).</p> <p>The Mining Law, approved in 2009, granted concessions to 5 strategic mining projects, among them Fruta del Norte, which planned to attract an investment of close to USD 800 million, provided that, within the environmental aspect, the direct or indirect, short or long term, reversible or irreversible environmental impact was considered (Rea Toapanta, 2017).</p>	<p>For two decades, large-scale mining had no place within the Ecuadorian territory, being the constant rejection of the indigenous communities a successful reference of opposition and resistance to this activity; however, after the approval of this law, certain mechanisms were established that facilitated the entry of this type of mining within the country, although it contradicted certain constitutional principles embodied in the 2008 Constitution (Chicaiza, 2010).</p>

Note: The table shows the international and national regulations for the protection of the environment and indigenous peoples and nationalities.

Source: ILO Convention 169 concerning Indigenous and Tribal Peoples in Independent Countries, 2014; ECLAC, 2014; Cosi Villalva de Chirinos, 2020; Mestanza-Ramón et al., 2021; Rivera-Parra et al., 2021; Martínez Espinoza, 2015; Mena & Silva, 2019; UN, 2007; Department of Economic and Social Affairs, n.d.; Department of Economic and Social Affairs of Indigenous Peoples, 2021; UN Inter-parliamentary Union et al., 2014; Añaños & Hernández, 2021; OAS, 2016; Millaleo, 2019; Constitución de la República del Ecuador, 2008; Gómez & León, 2016; Lewis, 2016; ECLAC, 2018; Ley de Minería, 2009; Rea Toapanta, 2017; Martínez, 2019; Chicaiza, 2010.

RESULTS

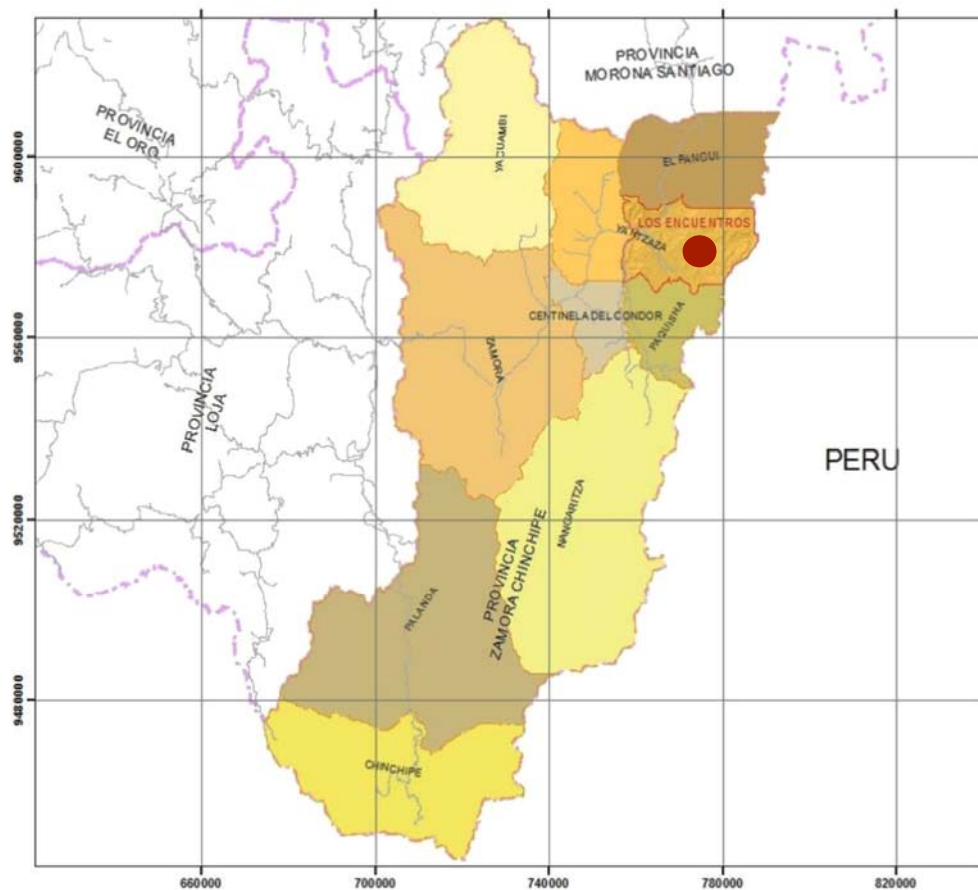
STUDY AREA

The canton of Yantzaza is located in the province of Zamora Chinchipe, approximately 41 kilometers northeast of the provincial capital Zamora (Ministerio de Turismo Ecuador, 2021). Its population is composed of mestizos, Kichwa, Saraguros, Afro-Ecuadorians and the Shuar nationality, for a total of 24,000 inhabitants (Alcaldía de Yantzaza, n.d.). A large part of its territory is primary forest and is made up of the parish center of Chicaña, the urban center of La Zarza and the parish center of Los Encuentros (G.A.D. Municipal de Yantzaza, n.d.).

For the development of the research, we considered the rural parish of Santa Ana de Los Encuentros (*Figure 1*), located between the Zamora and Nangaritza rivers. The parish consists of Mercadillo, Nankais, La Centza, Jardín del Cóndor, La Merced, La Delicia de los Encuentros, El Pindo, El Padmi, El Pincho and Muchime (G.A.D. Municipal de Yantzaza, n.d.).

Figure 1

Santa Ana de los Encuentros Rural Parish Location Map



Source: Based on G.A.D. Parroquial de Los Encuentros, 2015. p. 22.

Thus, the research case study includes the Shuar community “Tsez Entza” and the transnational mining company “Lundin Gold”. The Shuar community “Tsez Entza”, better known as Nankais, has an area of approximately 530 hectares and a warm subtropical climate, located along the Nangaritza River.

The community's main economic activities are fishing, agriculture (plantain and yucca), livestock, handicrafts, and to a lesser extent, work for the transnational mining company Lundin Gold. There are approximately 50 families in the community, 95% of which belong to the Shuar ethnic group. In addition, within these territories, there is a gold project called “Fruta del Norte (FDN)” (*Figure 2*), which practices large-scale mining; it is one of the most important projects in South America. The project is developed under the responsibility of the Canadian-Australian mining transnational Lundin Gold (G.A.D. Municipal de Yantzaza, n.d.); the same that in 2014 acquired the project, and in 2016 signed an exploitation contract (Solíz, 2016). The company has 29 metallic mineral concessions and 3 construction material concessions, covering approximately 64,609 hectares. FDN owns 7 concessions with an approximate area of 5,566 hectares. Mining operations commenced in late 2019 and by 2020 obtained 242,412 ounces of gold and gold concentrate. The transnational company is part of the United Nations Global Compact, which supports the Sustainable Development Goals (SDGs). It is also listed on the Toronto Stock Exchange and Nasdaq. For this reason, every year Lundin Gold prepares its sustainability report where it highlights all its mining activity and commits to the development of the SDGs (Lundin Gold, 2021).

Figure 2

Map of the Fruta del Norte Project Location



Source: Based on Cardno, 2018, p. 18.

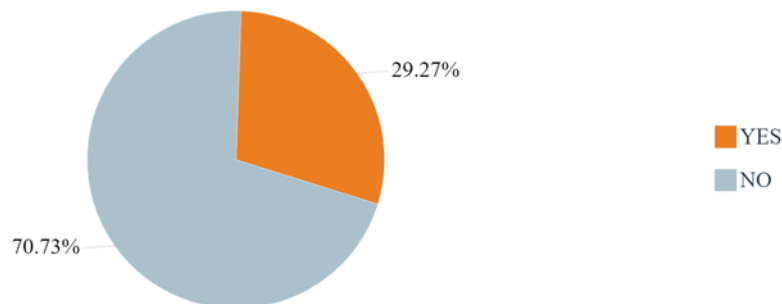
Mining, being an important activity for economic dynamization; brings with it a series of social, environmental and economic effects, which influence the communities surrounding the exploitation site (Saade Hazin, 2013). Therefore, in response to the established objectives, the socio-environmental impacts caused by the Canadian transnational company Lundin Gold in the Shuar community of Nankais in the province of Zamora Chinchipe will be addressed. For a better understanding, the general, economic, social and environmental aspects identified within the research process are presented.

1. General Aspects

According to the information obtained, it is evident that there is a perception of conflict with respect to the concept of sustainable development that Lundin Gold mentions in its 2020 Sustainability Report, as it refers to strategic investments in nearby local communities, aimed at improving their environmental, social and governance performance to ensure a balance between economic growth, care for the environment and social well-being (Lundin Gold, 2021). However, according to Interviewee 1: “Lundin Gold does not generate sustainable development; because it fails to comply with its policy of local investment, community labor and economic cooperation”. This is corroborated by 70.73% of the population of Nankais (*Figure 3*), who believe that the mining activity of the transnational does not generate sustainable development for their community.

Figure 3*Perception of Mining Activity in Relation to Sustainable Development*

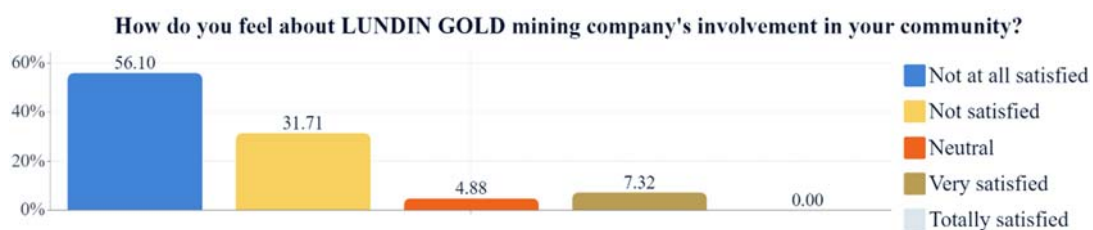
Do you believe that mining is an activity that generates sustainable development for your community?



Note: this figure shows the response to question No. 8 of the survey and refers to the community's perception of mining activity and sustainable development.

Source: Ochoa & Vásquez, 2022

In this regard, Lundin Gold claims to have around 300 local suppliers (Lundin Gold, 2020) and to have spent USD 23.3 million in 2020 on local purchases; in addition to creating long-term business opportunities within the communities (Lundin Gold, 2021). However, the population perceives a slow economic dynamization, lack of jobs, precarious basic services, lack of tourism, poor educational conditions and, above all, little improvement in terms of income (*Annex 3*). Likewise, the interviewees reported that the participation of the transnational mining company in their community has been null, so 56.10% are dissatisfied with its contribution (*Figure 4*), demonstrating a generalized dissatisfaction. In this way, interviewee 2 affirms: “Here they have not invested or helped the small businesses that we have, nothing has been stimulated or grown, (...) Los Encuentros has not grown because of Lundin but, rather, thanks to agriculture, cattle ranching and small-scale artisanal mining, (...) Lundin Gold is not interested in contributing to other sectors, they are only interested in extracting the gold and leaving, this mining is for opportunists and not for opportunities”.

Figure 4*Participation of Lundin Gold Mining Company in the Shuar Community of Nankais*

Note: the figure shows the response to question 14 of the survey and demonstrates the level of community satisfaction with Lundin Gold's mining activity.

Source: Ochoa & Vásquez, 2022

It was also discovered that the Ecuadorian State's regulation of mining activities in the sector has been null, which is demonstrated by the 58.54% who agree with the statement (*Figure 5*). In addition, the participants stated that when the mining concessions were granted to Lundin Gold's predecessor company, Kinross Aurelian¹⁰, there was no free, prior and informed consultation. As expressed by interviewee 2: “We

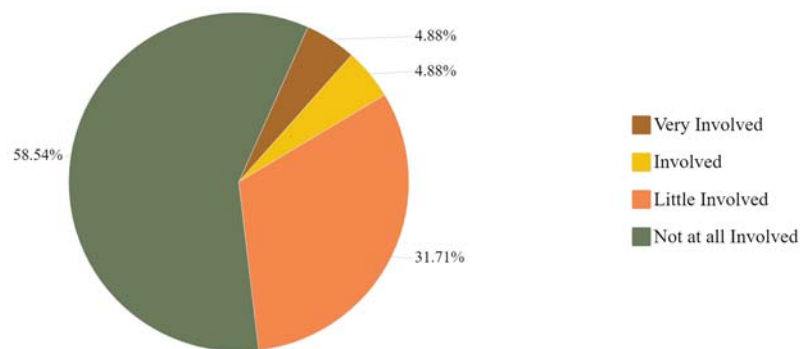
¹⁰ Kinross Aurelian is a Canadian gold mining company, the same company that sold the “Fruta del Norte” project to the Swedish-Canadian mining company Lundin Gold.

did not know that they were going to exploit until we were socialized in a talk when the concessions were already given; and if the government has given its permission for the exploitation, you can't do anything, but if you complain about something, you are prosecuted”.

Figure 5

Influence of the Ecuadorian State on the Shuar Community of Nankais

In your opinion, how has the Ecuadorian State participated in the mining activity of your sector?



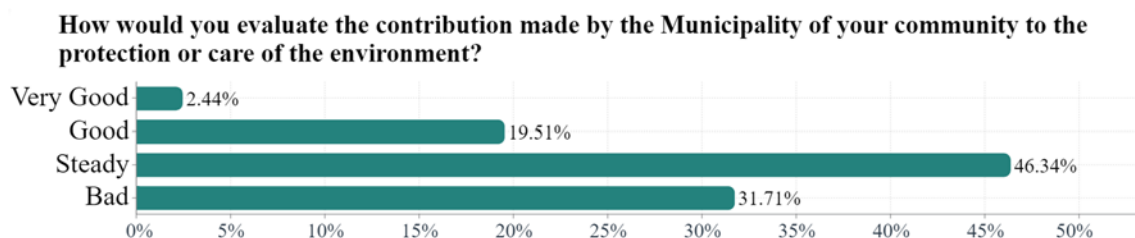
Note: the figure indicates the answer to question 13 of the survey, which refers to the perception of the Nankais community regarding the involvement of the Ecuadorian State in mining activities in the sector.

Source: Ochoa & Vásquez, 2022

The community's dissatisfaction with the management of the Municipality of Yantzaza in the environmental area was also identified, reflected in the 46.34% (**Figure 6**) who think that the administration has been regular and deficient; as interviewee 1 mentioned: “They have only helped us with waste collection and nothing else”. However, it should be mentioned that Lundin Gold in conjunction with the Provincial Government of Zamora Chinchipe, and through Mesas Temáticas (dialogue tables), built the bridge over the Zamora River after its collapse in October 2020 (Lundin Gold, 2021); although according to interviewee 2: “Only because there were protests next to the fallen bridge for more or less 19 days, Lundin Gold allocated resources to the prefecture, because they seemed that they were not going to do anything”.

Figure 6

Influence of the Municipality of Yantzaza on the Shuar Community of Nankais



Note: the figure shows the answer to question 12 of the survey and shows the perception of the Nankais community on the participation and influence of the Municipality of Yantzaza on mining activities in the sector in terms of the environment.

Source: Ochoa & Vásquez, 2022

2. Economic Aspects

Ron Hochsteinei, director and CEO of the transnational Lundin Gold, states that in 2020, 47% of FDN's workforce came from Zamora Chinchipe; he also highlights the commitment to SDG No. 8 (Decent Work and Economic Growth) and notes its commitment to providing an inclusive workplace along with the existence of a good relationship between Lundin Gold's staff and local communities (Lundin Gold, 2021). However, there is a lack of job opportunities, as only 9.76% are working and 17.07% have worked in the mining company (**Figure 7**); thus, interviewee 1 mentions: "most of the colleagues have not been taken into account for a job (...), the people who work there are chosen, young and single". For this reason, 75.61% have agriculture as their main economic activity (**Annex 4**), and the income of 63.41% is less than 100 USD per month (**Annex 5**).

Figure 7

Job Opportunity at Lundin Gold Mining Company



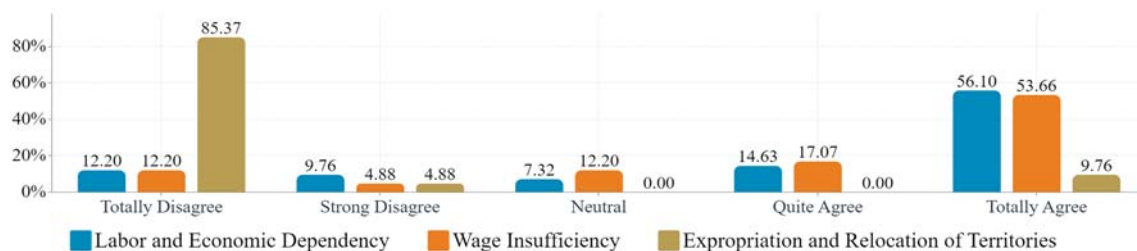
Note: the figure indicates the response to question 1 and 2 of the survey, which shows the employment opportunity that the community has had at Lundin Gold.

Source: Ochoa & Vásquez, 2022

In this regard, the economic difficulties perceived by the surveyed population have become evident (Figure 8); for this reason, 56.10% consider that there is a high level of labor dependence on mining activities, 53.66% speak of insufficient wages generated by the start of mining operations. While 85.37% think that the expropriation and relocation of territories is not an immediate consequence of mining exploitation, but it will happen at some point; since according to the comments of the participants, their area of residence is within ring 1¹¹ of exploitation.

Figure 8

Economic Aspects



Note: the figure shows the response to the economic aspect of question No. 18 of the survey and shows the variables of labor and economic dependence, wage insufficiency and the expropriation and relocation of territories.

Source: Ochoa & Vásquez, 2022

¹¹ The ring refers to the geographic area based on the concentric circular model and are the boundaries around the Fruta del Norte Project. In this project 4 rings are identified, where ring 1 comprises Los Encuentros Parish, where the Shuar community of Nankais is located (Lundin Gold, 2020).

3. Social Aspects

In Ecuador, there is evidence of the social impacts caused by mining, which is why several social movements have put up resistance to mega mining projects (Solano, 2013). In this regard, social impacts were identified in terms of health deterioration, domestic violence and crime.

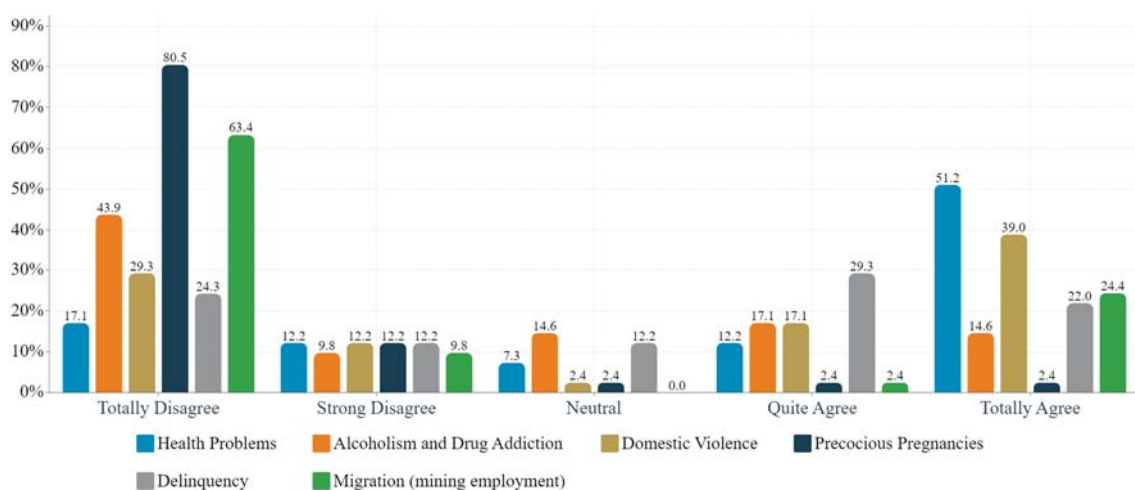
Thus, 51.22% of the participants (**Figure 9**) consider that there is a direct relationship between the beginning of mining activities and the deterioration of their health, since they have regularly suffered from illnesses such as flu, pneumonia, and respiratory and pulmonary problems. For this reason, interviewee 1 states: “the illnesses we suffer are caused by the dust, carbon monoxide and very strong odors coming from the mine”.

Similarly, 39.02% believe that domestic violence has intensified since the mining operations; participants stated that most of the people working in the company have been divorced and have had emotional problems of anger and stress. Similarly, 29.3% believe that crime has intensified since the arrival of the transnational.

On the other hand, aspects such as alcoholism and drug addiction, early pregnancies and migration have not been considered relevant or direct consequences of mining activity, according to the perception of the surveyed population.

Figure 9

Social Aspects



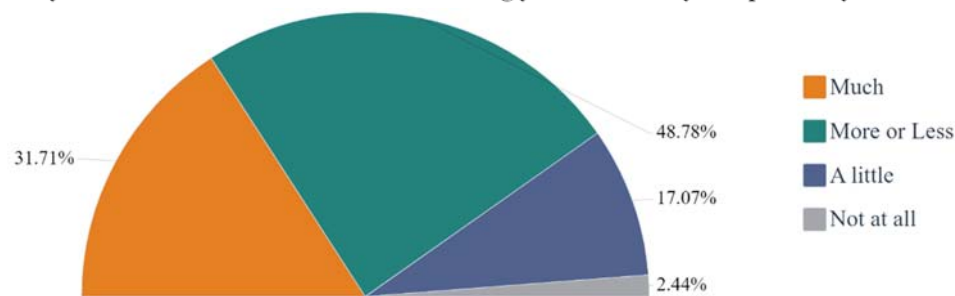
Note: the figure shows the social aspect of the response to question No. 18 of the survey, which includes the variables of health problems, alcoholism and drug addiction, domestic violence, early pregnancy, delinquency and migration.

Source: Ochoa & Vásquez, 2022

In this sense, a certain polarity was also found with respect to mining activity, since 48.78% consider that the company's mining activities have generated division in terms of popular opinion (**Figure 10**); because some are in favor and others are against this activity. According to interviewee 1: “50% agreed with mining and the other 50% opposed it, mainly because of the lack of job opportunities”.

Figure 10*División Popular ante la Actividad Minera*

Do you consider that with the arrival of mining your community was politically divided?

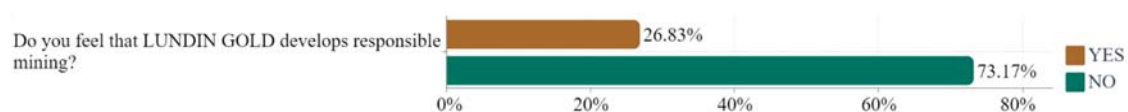


Note: the figure indicates the response to question 11 of the survey and shows the perception of the Shuar community and the division of opinions on mining activities in the sector.

Source: Ochoa & Vásquez, 2022

4. Environmental Aspects

Regarding the environmental aspect, Lundin Gold states that it has a Responsible Mining policy committed to the Alianza para la Minería Responsable en Ecuador (AMRE), whose vision is to promote more responsible and sustainable mining practices (Lundin Gold, 2020). Ron Hochsteinei also committed to the development and implementation of responsible mining-based governance. However, 73.17% of the surveyed population considers that the transnational company has not carried out responsible mining in their territory (*Figure 11*), nor has it tried to reduce the environmental impacts it generates, as shown by 75.61% of the respondents who agree with this statement (*Annex 6*). On the other hand, 73.17% consider that the environmental situation within their community has been maintained, since the damages are not evident (*Annex 7*).

Figure 11*Nankais Community Perception of Lundin Gold Responsible Mining*

Note: the figure expresses the answer to question No. 15 and shows the perception of the Shuar community regarding responsible mining by Lundin Gold.

Source: Ochoa & Vásquez, 2022

In addition, Lundin Gold claims that the use of water and other water resources for mining activities has been efficient (Lundin Gold, 2021); as the Awareness and Preparedness for Emergencies at the Local Level (APELL)¹² program has been implemented to avoid cyanide contamination of water (Lundin Gold, 2020). Similarly, the president and CEO has taken responsibility for meeting SDGs 6 and 15 (Clean Water and Sanitation – Life of Terrestrial Ecosystems); conserving biodiversity and respecting traditional land use for indigenous peoples' cultural activities; as well as reducing Greenhouse Gas (GHG)

¹² Awareness and Preparedness for Emergencies at the Local Level (APELL) is a program of the United Nations Environment Program, which prepares and organizes emergency attention to local communities. It is supported by a procedure to raise awareness of possible threats and provides training for an efficient emergency service to deal with disaster situations (Sáenz, n.d.).

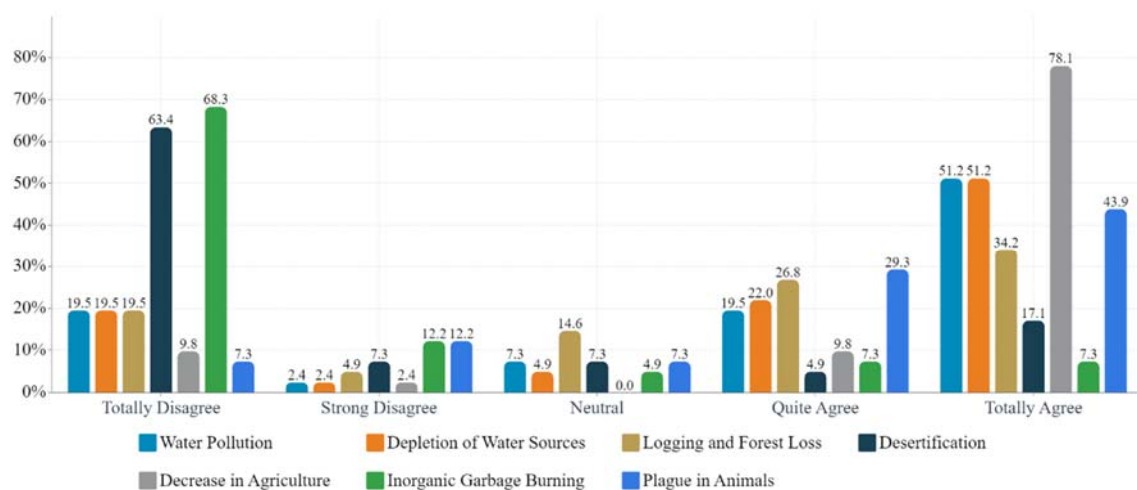
emissions and consciously managing mining waste deposited in tailings¹³ in the Zarza River Valley¹⁴ (Lundin Gold, 2021). However, 51.2% of those surveyed consider that there has been strong water contamination and depletion of water sources (**Figure 12**); thus, interviewee 2 mentions: “The tailings that they have in Zarza have water hoses with cyanide, (...) supposedly the tailings do not contaminate because they are covered, but when it rains everything that is there is watered down the mountain and reaches the river from which we drink water. That water is contaminated with cyanide, which is a material they use to extract the gold”.

Likewise, 34.2% believe that forests have been lost and 43.9% believe that animal plague has intensified; therefore, biodiversity has been endangered by mining operations; as interviewee 1 states: “Some colleagues did not allow them to enter their farms when they were in the exploration phase, because they saw how the farms were destroyed elsewhere (...) in addition, near the mine the animals die and there are none that can survive or breed”. Regarding agricultural activity, 78.1% believe that it has been drastically reduced due to the supposed opening of a new source of work within the mining company.

On the other hand, the local population perceives desertification and burning of inorganic waste as not relevant environmental impacts within their community, since they have not yet witnessed such scenarios.

Figure 12

Environmental Aspects



Note: the figure shows the environmental aspect of the response to question 18 of the survey and includes the variables of water pollution, depletion of water sources, logging, and loss of forests, desertification, decline in agriculture, burning of inorganic waste and pest in animals.

Source: Ochoa & Vásquez, 2022

¹³ Tailings are the waste as a result of mineral transformation processes and depending on their chemical characteristics, they will have to undergo treatments so that they do not generate environmental problems; in addition, circular economy is usually applied to tailings as an alternative for the development of products such as poles, cement, etc (Ministerio de Minas y Energía, Dirección de Minería Empresarial y Asesorías Técnicas Geológicas ATG Ltda., 2020).

¹⁴ The Cordillera Zarza is part of Zamora Chinchipe and is classified as an orographic zone.

DISCUSSION

It is evident that the perception of socio-environmental conflict in the Shuar community of Nankais is related to the beginning of mining activities carried out by the transnational company Lundin Gold. Thus, the research found certain economic, social and environmental impacts that affect the population, which are related to the lack of sustainable development; the lack of economic, social and environmental participation of the mining company; as well as the lack of presence of the Ecuadorian State to regulate mining exploitation and the poor governance of the Municipality of Yantzaza with respect to the quality of public services, generating distrust towards public institutions. Thus, it was observed that in the parish of Puerto Napo (Napo province) in 2020, there were similar cases related to dissatisfaction with the work of the authorities, the low quality of public services and the inefficient management of institutions (Ruiz Morales, 2021). Likewise, in the Pananza parish, San Juan Bosco canton (Morona Santiago province), the lack of sustainable local development and the existing distrust towards State institutions and their deficient public policies that favored only the private sector for access to and control of natural resources, without taking into account the needs of the communities, were observed (Eguiguren & Jiménez, 2011).

In this sense, the following economic impacts were identified in the community of Nankais: Limited job opportunities within the transnational, and a high labor dependency and insufficient wages caused by the start of mining activities. This was also evidenced in research conducted in the parishes of Puerto Napo (2020), Pachicutza, El Guismi and Tundayme (2016) and Pananza (2011); where discontent and dependence in terms of economic income and labor opportunities were demonstrated, leading to the impoverishment of the population (Ruiz Morales, 2021; Sánchez-Vázquez et al., 2016; Eguiguren & Jiménez, 2011). However, in the unique case of Pachicutza, El Guismi and Tundayme, migration and delinquency were identified as an economic factor (Sánchez-Vázquez et al., 2016), a situation that was not witnessed in this case study as well as what happened in the community of Conguime in the Paquisha canton, where mining activity is the main source of economic income for the population (Eguiguren et al., 2018).

In terms of social impacts, it was found that after the start of mining exploration, domestic violence and crime increased significantly, as occurred in the parishes of Pachicutza, El Guismi and Tundayme (2016) where domestic violence was also observed (Sánchez-Vázquez et al., 2016). It was also discovered that mining operations are the cause of respiratory problems suffered by the population; this impact being a consequence present only within the Shuar community studied. On the other hand, the division of the population regarding the opinion on Lundin Gold's mining activities was observed, as happened in Pachicutza, El Guismi and Tundayme; however, in these parishes a greater amount of social impacts were also observed compared to the case study of this research; such as alcoholism in adolescents, drug addiction with contact cement, relocation, early pregnancy, lack of transportation in rural neighborhoods and in the Shuar community, lack of socialization of the Land Management Plan (PDOT), forced evictions from the parishes and the massive purchase of land by the mining company (Sánchez-Vázquez et al., 2016). Likewise, only in the parish of Puerto Napo were the relationships between the community and its environment found to be altered (Ruiz Morales, 2021).

With respect to environmental impacts, it became evident that the transnational Lundin Gold has not taken the necessary measures to mitigate the environmental damage caused by its mining activity, i.e., there has been no responsible mining in the area; As a result of this inefficiency, there has been excessive water pollution, depletion of water sources, logging and loss of forests, great decrease in agriculture and animal pests, as has occurred in the Pananza parish, the Conguime community of the Paquisha canton and the Pachicutza, El Guismi and Tundayme parishes (Eguiguren et al., 2018; Sánchez-Vázquez et al., 2016). On the other hand, in the parish of Puerto Napo and in the community of Conguime, there was soil erosion and wear, annoying noise and vibrations, and air pollution (Ruiz Morales, 2021; Eguiguren et al., 2018). Meanwhile, in the parishes of Pachicutza, El Guismi and Tundayme, inorganic waste burning and desertification were identified as environmental effects associated with mining (Sánchez-Vázquez et al., 2016).

CONCLUSION

It is evident that the mining activities developed within the national territory have influenced the life of the communities near the mining concession sectors, both in economic, social and environmental aspects. Despite the existence of international norms such as Convention 169 of the International Labor Organization, the United Nations Declaration on the Rights of Indigenous Peoples, the United Nations Resolutions on Indigenous Peoples and the American Declaration on the Rights of Indigenous Peoples, in this community there is a violation of the right to development and social welfare, the right to political participation, the right to free, prior and informed consultation, the right to health, the right to their territories and resources, and above all, the right to a healthy and sustainable environment. Thus, these rights, being of light application, directly violate economic, social and environmental rights, where the most affected are the indigenous peoples near the mining concessions.

Now, with respect to national regulations, the Ecuadorian Constitution in Art. 14, speaks about the "right to a healthy environment"; and according to the perspective of the Nankai community, there has not been a relevant application of the right to a healthy and sustainable environment, where biodiversity, agricultural practices and water quality are preserved. Also, within the Nankais community, there was no free, prior and informed consultation before the mining concessions were granted to the transnational company, as stated in Art. 57 of the Constitution and Art. 87 of the Mining Law; generating, therefore, an atmosphere of uncertainty and fear of future displacement as a result of mining operations. This issue is extremely important because this right of indigenous peoples is considered an instrument for the exercise of the right to self-determination. On the other hand, the regulations contained in the Organic Environmental Code, the dimensions that it contemplates have been broken in this community, given that development is inefficient for the protection of nature and therefore environmental rights and guarantees. Finally, although the Mining Law tries to be applied for the development of mining and its control, there is still discontent and rejection from the indigenous communities because it contradicts the principles of that "good living" that were established in the Ecuadorian Constitution.

Thus, when analyzing the Shuar community of Nankais, the non-compliance with the aforementioned regulations is demonstrated and it is clear that the socio-environmental impact of mining is perceived in this sector, since they are expressly linked to the mining activity of the Fruta del Norte Project of the transnational company Lundin Gold. For this reason, the community believes that neither the government nor the municipality to which they belong are protecting their territories and rights as indigenous peoples. Thus, the lack of involvement of authorities resulted in the triggering of economic, social and environmental impacts. On the one hand, regarding the economic impact, it was discovered that in the Nankais community, job opportunities are scarce in Lundin Gold, and the few people who managed to get jobs in this mining company have a high labor dependence and an insufficient salary; thus, it is possible to determine the partial non-compliance regarding Sustainable Development Goal 8 (Decent Work and Economic Growth), since inclusion and full employment are not promoted, and the community in this aspect should be a priority according to the commitments established by Lundin Gold.

Regarding social impacts, in relation to the economic impact, there is no compliance with Goal 1 (End Poverty) and Goal 10 (Reduce Inequalities), since in the perception of the community, Lundin Gold does not generate sustainable development and consequently there is no dynamization in the community's economy. In addition, in this social aspect there has been a population division regarding the opinions for and against the extractive activity of the transnational, because some people are affected in a positive way economically, however, there are disadvantaged groups who do not feel comfortable with the development of mining in the sector. Likewise, other social impacts such as domestic violence and delinquency were linked to the mining activity, since people, depending on their working conditions and opportunities provided by the mining company, bring as a consequence these acts. In addition, ailments were identified in the community of Nankais, since Lundin Gold's activity is a factor causing respiratory problems that threaten the health and well-being of the people in this sector.

Ultimately, in terms of environmental impacts, it was found that Lundin Gold does not generate responsible mining, because there is water pollution and depletion of water sources, which violate Goal 6 (Clean Water and Sanitation) and the community does not enjoy an essential natural resource that is also a human right. Likewise, forest clearing, reduction of agricultural activity due to forest loss, and animal plague are also present; thus, all of the above is a consequence of the arrival of Lundin Gold, where Goals

13 (Climate Action) and 15 (Life of Terrestrial Ecosystems) are impacted by the lack of management and development of a mining industry that should be based on social responsibility and respect for nature.

In this sense, it can be said that the policies of national application should be committed to the sphere of responsible governance and greater attention to the study of socio-environmental impacts. Therefore, the Shuar community of Nankais needs to improve their quality of life with a better management of government policies and a deep analysis of the socio-environmental impacts generated by mining; so that in this way there really is social responsibility on the part of the Ecuadorian State and in this way true sustainable development is guaranteed.

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ANNEXES

Annex 1

Questions Directed to Interviewee 1 and 2

Interviewee 1

1. How have the community members of Nankais felt after the arrival of the mining company “Lundin Gold”?
2. How has the mining operation influenced and/or changed their lives?
3. Have there been any conflicts between the mining company and the community? Which have been the main ones you have detected?
4. What has been the economic development of the community members after the arrival of the mining company? Have jobs increased? Has the standard of living improved?
5. How is the relationship between the community and the Municipality of Yantzaza? Have the requests or requirements they have had been fulfilled?
6. Have there been internal conflicts among the community members after the arrival of the mining company?

Interviewee 2

1. How have you felt after the arrival of the mining company “Lundin Gold”?
2. How has the mining operation influenced and/or changed your life?
3. Have there been any conflicts with the mining company, and which have been the main ones detected?
4. Has public opinion been politically divided regarding Lundin Gold's mining activity?
5. Do you believe that Lundin Gold has complied with the mining and sustainable development proposals?

Note: Respondents will be kept anonymous.

Annex 2

Outline of the Survey conducted to the Shuar Community of Nankais in relation to Lundin Gold's Mining Activity

Impactos Ambientales de la Minería: Estudio de Caso Transnacional "Lundin Gold" en la Comunidad Shuar de Nankais en Zamora Chinchipe entre 2019 a 2021

Por favor, responda la siguiente encuesta. La información obtenida será utilizada, exclusivamente, para la investigación sobre los impactos socio-ambientales, generados por la extracción de oro en la localidad de Nankais, provincia de Zamora Chinchipe por la empresa minera "LUNDIN GOLD". Sus respuestas serán tratadas de forma confidencial y anónima.

Género: Femenino _____ Masculino _____

Edad: _____

Nivel de Educación: Ninguno _____ Primaria _____ Educación básica y/o media _____ Superior _____

1. ¿Trabaja en la minera LUNDIN GOLD?

SI _____ NO _____

2. ¿Ha trabajado en la minera LUNDIN GOLD?

SI _____ NO _____

3. En caso de contestar SI a una de las preguntas anteriores, ¿Por cuánto tiempo ha trabajado en la empresa?

1 a 6 meses _____ 7 a 12 meses _____ Otro: _____

4. ¿Cuál es la principal actividad económica que Ud. actualmente realiza?

- Agricultura
 Crianza de animales
 Minería
 Venta de productos
 Transporte
 Otra (Especifique): _____

5. ¿Cuáles son sus ingresos mensuales aproximados?

- Menos de 100
 100 a 425 dólares
 425 a 800 dólares
 más de 800 dólares

6. ¿Con qué frecuencia se enferma?

Siempre _____ Regular _____ Poco _____ Casi nunca _____

7. En los últimos años, se le ha identificado alguna enfermedad de las siguientes a mencionar:

- Covid-19
 Neumonía
 Bronquitis
 Pulmonía
 Otra: _____

8. ¿Cree Ud. que la minería es una actividad que genera desarrollo sostenible para su comunidad?

SI _____ NO _____

9. Si su respuesta es SI, señale el porqué:

- Dinamizó la economía de la comunidad.
 Mejoraron los ingresos de la comunidad.
 Incrementó el turismo
 Mejoraron las condiciones de educación
 Mejoraron los servicios básicos

10. Si su respuesta es NO, señale el porqué:

- No ayudó a dinamizar la economía de la comunidad.
 No mejoró los ingresos de la comunidad.
 No incrementó el turismo
 No mejoraron las condiciones de educación
 No mejoraron los servicios básicos

11. ¿Considera que con la llegada de la minería se dividió políticamente su comunidad?

Mucho _____ Más o menos _____ Poco _____ Nada _____

12. ¿Cómo evaluaría la contribución que hace el municipio de su comunidad a la protección o cuidado del medio-ambiente?

Muy buena _____ Buena _____ Regular _____ Mala _____

13. Desde su opinión, ¿Cómo ha sido la participación del Estado Ecuatoriano frente a la actividad minera de su sector?

- Muy involucrados.
 Involucrados
 Poco involucrados
 Nada involucrados

14. ¿Cómo se siente Ud. con la participación de la empresa minera LUNDIN GOLD en su comunidad?

- Nada Satisfecho
 Poco Satisfecho
 Neutral
 Muy Satisfecho
 Totalmente Satisfecho

15. Según Ud. ¿siente que LUNDIN GOLD desarrolla minería responsable?

SI _____ NO _____

16. Referente a la pregunta anterior, ¿considera Ud. que la empresa LUNDIN GOLD hace algo para reducir los impactos de la actividad minera?

SI _____ NO _____

17. Respecto al área de su comunidad, ¿Ud. cree que la situación medio-ambiental en los últimos años ha...?

Mejorado _____ Mantenido _____ Empeorado _____

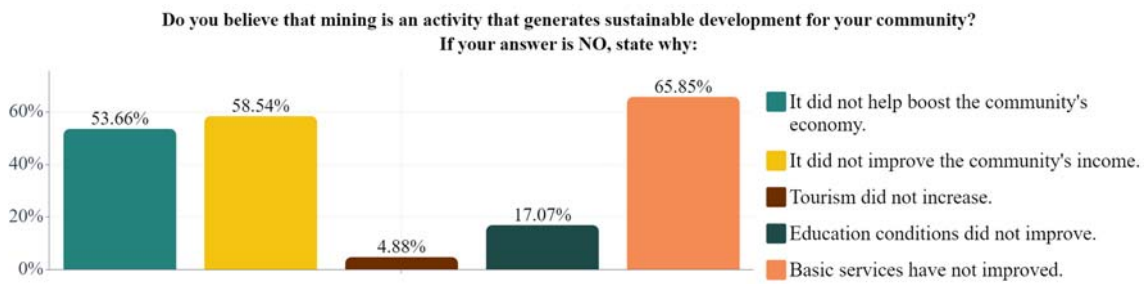
18. ¿Cuánta incidencia cree Ud. que tiene los siguientes aspectos en relación con la actividad minera de LUNDIN GOLD?

Por favor, señale del 1 al 5 (donde 1 es totalmente en desacuerdo y 5 totalmente de acuerdo) según su perspectiva:		Totalmente en Desacuerdo	Bastante en Desacuerdo	Neutral	Bastante de Acuerdo	Totalmente de Acuerdo
Aspecto	Variable	1	2	3	4	5
Económico	Dependencia Laboral y Económica					
	Delincuencia					
	Insuficiencia Salarial					
	Migración (empleo en la minera)					
Social	Problemas de Salud					
	Violencia Intrafamiliar					
	Alcoholismo y Drogadicción					
	Embarazos precoces					
Ambiental	Expropiación y Reubicación de territorios					
	Contaminación del Agua					
	Agotamiento de Fuentes Hídricas					
	Tala y Pérdida de Bosques					
	Desertificación					
	Disminución de la Agricultura					
	Quema de Basura Inorgánica					
	Peste en Animales					

! Gracias por Responder ;

Annex 3

Mining and Sustainable Development in the Nankais Community

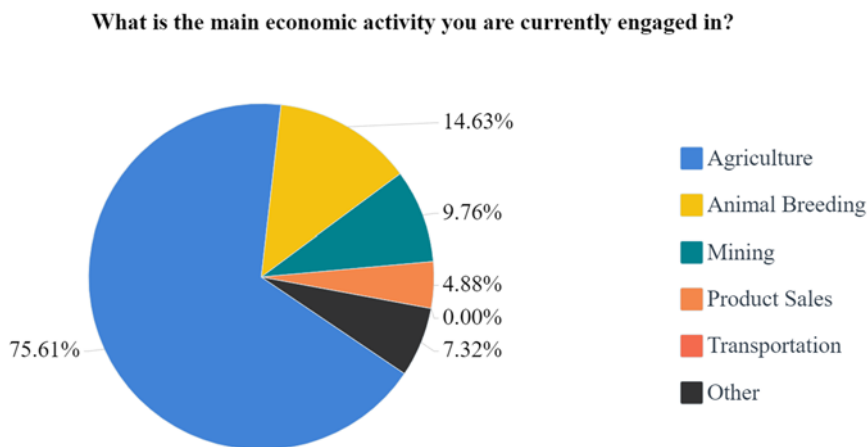


Note: the figure shows the response to question No. 10 of the survey and refers to mining as an activity that generates sustainable development.

Source: Ochoa & Vásquez, 2022

Annex 4

Economic Activity of the Nankais Community

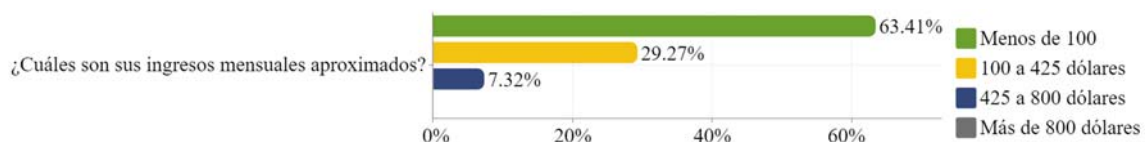


Note: the figure represents the response to question No. 4 of the survey and indicates the economic activities carried out by the Nankais Community.

Source: Ochoa & Vásquez, 2022

Annex 5

Monthly Income of the Nankais Community



Note: the figure expresses the answer to question No. 5 of the survey and shows the monthly income from the economic activities carried out by the people of the Nankais Community.

Source: Ochoa & Vásquez, 2022

Annex 6

Lundin Gold as a Stakeholder to Reduce the Impacts of Mining Activity

Referring to the previous question, do you consider that LUNDIN GOLD does anything to reduce the impacts of mining activities?

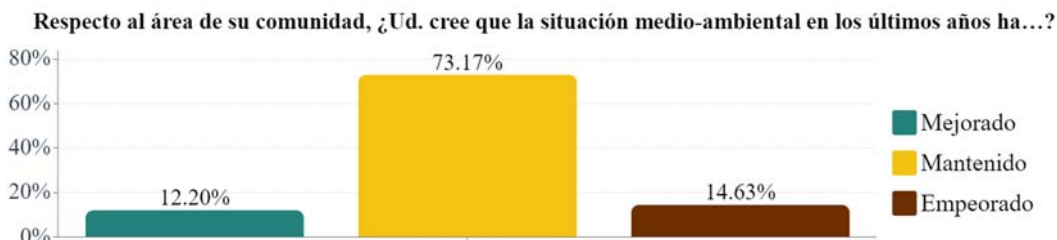


Note: the figure shows the response to question No. 16 of the survey and shows the perception of the Nankais Community regarding Lundin Gold's actions to reduce the impacts generated by its mining activity.

Source: Ochoa & Vásquez, 2022

Annex 7

Environmental Situation in the Nankais Community



Note: the figure shows the response to question 17 of the survey and indicates the perception of the Nankais community regarding the environmental situation of their sector.

Source: Ochoa & Vásquez, 2022