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Neo-Extractivism and Formalization of Artisanal and Small-Scale Mining—The Case of the Santurbán Moorland (Colombia)

Ruth Zárate Rueda 1,*, Yolima Ivonne Beltrán Villamizar 2 and Luis Eduardo Becerra Ardila 3

1 School of Social Work, Universidad Industrial de Santander, Bucaramanga 680006, Colombia
2 School of Education, Universidad Industrial de Santander, Bucaramanga 680006, Colombia
3 School of Industrial and Business Studies, Universidad Industrial de Santander, Bucaramanga 680006, Colombia
* Correspondence: ruzarate@uis.edu.co

Abstract: The purpose of this paper is to analyze the negative impact of neo-extractivism to boost the mining industry and the components that prevent the formalization of ASM as a model of rural economic development in Vetas, California, Suratá, and Matanza, municipalities adjacent to the Santurbán moorland (Colombia). A qualitative methodology with ethnographic design was followed, implementing the NVivo software (v12) for the analysis of information. The results show that the neo-extractivist model stands in opposition to the formalization of ASM in the territory, which prevents the prioritization of rural economic development by regional and local governments. ASM is at a disadvantage with respect to large-scale extractive industry, although this activity has been carried out in this region for centuries; it is also under threat as a result of a delimitation process that seeks the protection of the moor ecosystem, putting at risk the economic and socio-environmental stability of the communities that depend on this activity.

Keywords: neo-extractivism; artisanal and small-scale mining; formalization; Santurbán moorland

1. Introduction

Countries in the global south are characterized by having the greatest mining activity, resulting from the wealth of raw materials such as gold, nickel, coal, diamonds, bauxite, among others [1,2]. Latin America (LA) has stood out as a territory for metal exploration and exploitation, and its exports have concentrated on primary products and manufacture based on natural resources [3,4]. In this way, the ‘boom of commodities’ at the beginning of this century strongly influenced the economic context of LA countries, giving rise to a leading role of the state [5].

According to Gudynas [6], the term extractivism dates back to the 1970s, and it describes the evolution of mining and oil exports, to consider the variety of natural resources that endure systematic exploitation by transnational capitals [7]. Extractivism is defined as a “particular case of extraction of natural resources, characterized by an extraction in large volumes or under high intensity procedures, which are essentially export-oriented as raw materials or with minimal processing” [8] (p. 80). In this context, the expansion of extractivism has contributed to ecological pollution and the interest of governments in granting titles to develop extractive projects [9].

Between 2000 and 2010, LA economies increased at an average rate of 5% per year. However, between 2011 and 2015 this decreased considerably due to the reduced demand for commodities, which led to the slowdown of the economy [10], especially in countries with significant extractive sectors where, despite the crisis, governments have persisted in extractive activities as a model of development at “all costs” [5]. In extractivism, the state assumes a passive role, which restricts the guarantees for basic conditions, such as tax and environmental labor flexibility, capital movements, among others [11].
According to Llosa [12], as long as the notion of development is synonymous with commercializing natural resources, extractivism will be a necessary evil to improve people’s quality of life and attain economic balance. Arsel et al. [5] argue that imperative extractivism creates its own dependency and legitimation mechanisms, giving rise to a development model known as neo-extractivism, which raises a public debate between resource extraction and development. In this regard, Svampa [13] argues that neo-extractivism is at the center of contemporary extractive accumulation. Therefore, in LA, it has arisen as an analytical category to mark the current socio-ecological and economic crisis, as revealed by claims and mobilizations [14].

In the scientific literature, neo-extractivism is analyzed as a branch of the extractive sector of the economy in LA [15]; consequently, it is an emerging issue in the field of critical studies with a progressive and neoliberal perspective [16,17]. According to Guerisoli and Mandirola [18], the neo-extractivist model ‘reprioritizes’ economies by relying on natural resources to take advantage of the global demand for minerals and hydrocarbons; in turn, it promotes capital accumulation, which opposes a development model [19]. In this sense, Warnecke-Berger et al. [20] consider that neo-extractivism has limitations due to the contradiction with the sustainable objectives of wealth redistribution, in contrast to the potential for structural transformation and inclusive and egalitarian development.

Some scholars take neo-extractivism as the new model of extraction of the 21st century; others understand it from a progressive perspective of redistribution. In this study it will be understood as the justification for the exploitation of nature as a project to promote development [10], the disintegration of territories, land grabbing, the destruction of biodiversity, and open-pit or large-scale mega-mining, involving the investment of foreign capital [21]. Meanwhile, the experiences of communities inhabiting territories with enlarged extractive projects are not encouraging. According to Arsel et al. [5], discrepancies with state decisions have increased and social conflicts are not limited to the environmental and economic arenas; in contrast, communities are interested in their community identity, their political freedom, and in alternative changes.

In Colombia, extractivism is widely related to artisanal and small-scale mining (ASM), which is classified into three categories: small-scale, traditional, and subsistence mining [22]. The Colombian State Mining Code introduced ‘subsistence mining’ in 1988 and recognized its cultural dimension [23]; however, it is difficult to quantify the production of this economic activity, since approximately 85% of the gold produced comes from legal and illegal ASM [24].

Despite the adoption of the National Policy for the Formalization of Mining, the Policy for Improving the Productivity and Competitiveness of the Mining Sector, and the Development and Evaluation Program of Mining Districts [25], close links between illegal armed groups and ASM prevail in Colombia [26]. This takes place mainly due to the modality of extortion in communities [24].

From colonial times to the present, attempts to modernize and industrialize the mining sector have been limited, specifically by the enclave economy pattern [27]. Consequently, the formalization of ASM suggests the construction of development policies and interventions focused on human and social capital, as an aspect that transcends legal requirements and focuses on promoting ASM as a sustainable source for livelihood [24].

In this context, the socio-environmental conflict that has developed due to the activity of ASM in the Santurbán moorland stands out. The Santurbán moorland, technically known as the Complex of Jurisdiction-Santurbán-Berlín moorland ecosystem, hereinafter the “Complex”. It has an area of approximately 142,000 hectares, located at a height between 2800 and 4290 m above sea level. Of this Complex, 72% is located in the territory of Norte de Santander and 28% in the department of Santander. Figure 1 shows the location of the Santurbán moorland.
Moor ecosystems are located at heights between 3100 and 4000 m above sea level. They receive sunlight all year round in unique quality and quantity thanks to their location in the equatorial zone, which are beneficial to develop their vegetation. They are endowed with water regulation and, given their low temperatures, evaporation is reduced, and water is stored in their plants [28]. The Santurbán moorland is recognized as the birthplace of several rivers, and is home to periglacial wetlands, lagoons, and river basins [29].

The moorland is characterized by geological formations given by surface and underground water dynamics, which supply water to Bucaramanga and the province of Soto Norte (California, Charte, Matanza, Suratá, Tona, and Vetas) [30]. In turn, it includes the mining district of Vetas-California, of high economic importance for Santander due to the abundance of “gold and silver strands, associated with iron, lead, zinc, copper and sulfosalt or non-oxidized sulphur minerals” [29] (p. 42).

The Vetas-California district has stood out due to the ASM exploitation of gold since colonial times [31], an activity that has been preserved over time as an inherited and consolidated activity in family businesses [32]. ASM refers to the extraction and processing of materials with reduced technical skills, extensive labor, and it is regularly produced in informal settings [33].

Large-scale mining (LSM) is a derivation of neo-extractivism that promotes the entry of transnational capital to emerging economies; therefore, there is a political legitimation of mega-mining, legal flexibility, and reduced consequences related to its socio-environmental effects on the territories [34,35]. In this context, ASM and LSM are antagonistic, since governments have sought to eradicate the former to introduce transnational companies that generate greater fiscal profitability [36]; consequently, ASM is usually associated with poverty, human rights violations, child labor, the use of mercury and cyanide, land degradation, negative impacts on the ecosystem, and socio-environmental conflict [37].

For this research, the socio-environmental conflict linked to neo-extractivism and ASM in the territory of the Santurbán moorland is emphasized. In this regard, the various elements that make up the dynamics of the conflict are described. First, the Colombian
government has bet on the immersion of foreign companies in the vicinity of the Complex, through various attempts to obtain the environmental operating license by Canadian and Arab organizations in the last ten years [32,38]. However, through various urban collective mobilizations, the projects have been revoked due to the negative environmental impacts they might cause in the moorland ecosystem and the water resource that feeds neighbouring populations [39].

Second, although the government is not interested in granting mining titles to the communities to develop ASM, it has suggested its replacement, while increasing the requirements to formalize this activity; a situation that has caused greater disagreement among the locals [40]. Third, there is a clash of interests between the urban and rural population, since for urban inhabitants the extraction of gold and the conservation of the moorland are incompatible, not considering the sustainable practices in the care of land and water that miners and peasants perform daily, from the logic of productivity and ecological culture [38,41].

The three aforementioned elements reveal a breaking point where rural communities developing ASM in the moorlands may be allowed to formalize their mining activities, facing a challenge to preserve both ecosystem sustainability and their quality of life. The purpose of this paper is to analyze the negative impact of neo-extractivism to boost the mining industry and the components that prevent the formalization of ASM as a model of rural economic development in Vetas, California, Suratá, and Matanza. This paper intends to provide a glimpse on the importance of the problem in question, since in Colombia the needs and perceptions of rural communities that depend on ASM in the Complex are usually ignored; therefore, alternative solutions are proposed from a socio-environmental perspective.

2. Literature Review
2.1. Neo-Extractivism in Latin America

There are different perspectives and interpretations on the implications of neo-extractivism in LA. According to Svampa [42], this model originated in the transition from the Washington Consensus to the Consensus of the Commodities; the former emerged as a referent for economic policy between the 1980s and 1990s, from a vision of globalization, growth, macroeconomic stability, and poverty reduction [43,44]. The latter is characterized by the export of primary goods to industrialized countries on a large scale, which implies the acceptance of new environmental and political inequalities by LA countries [21]. Consequently, neo-extractivism “installs a vertical dynamic that barges in the territories and as it moves in, it destructures regional economies, destroying biodiversity and exacerbating in a dangerous way the process of land grabbing, as rural communities are expelled or displaced” [45] (p. 34).

However, Gudynas [46] affirms that the state plays an active role in neo-extractivism from a progressive perspective, as an opportunity to fight poverty and promote development with the surplus generated by the extractive sector; however, the socio-environmental impacts and other contradictions of the model are dismissed [11]. In countries such as Bolivia, Ecuador, and Venezuela, neo-extractivism has been a protagonist due to the participation of the state through state-owned or mixed companies and this activity has been legitimized as a synonym for progress [47]. In the Colombian setting, investments in the primary sector have been aimed at facilitating the immersion of private capital. Colombia has witnessed an unbridled mining extractivism marked by a discourse on productivity, efficiency, and technification [48]. Thus, in Colombia, the neo-extractor component has been adopted with foreign investment, through binational agreements and the protection of extractive companies in the execution of their projects [49].

According to Svampa [13], one of the particular features of neo-extractivism in LA is the development of capital-intensive activities, but not intensive in terms of labor; in this regard, it is evident that neo-extractivism does not substantially change the structure of accumulation and appropriation of nature, while socio-environmental conflicts and hegemonic extractivist policies prevail [50]. Therefore, it is pertinent to ask one of the
questions posed by Görg et al. [51]: “why could governments not—and in many cases did not even want to—reduce, in a historically exceptional situation, the dependence on the world market and promote certain forms of industrialization and an internal market?” (p. 11). This assumes that extractivism has been widely attractive to global economies in the LA continent since the colonial era, and it has been presented as a successful development model that in reality leads to soil depletion, biodiversity decline, and water pollution [52].

2.2. Artisanal and Small-Scale Mining

Gold ASM may represent between 10 and 15% of the annual production worldwide [53]; it is also characterized by being developed in the informal sector as a precarious practice of relatively sustainable livelihood over time, implementing rudimentary techniques and low levels of technology [54]. These techniques consist of manual tools that require physical effort from miners, having an impact on their health [55]. It is generally conducted in areas with ancient mining explorations and near rivers [37]; hence, it has become a low-skilled employment source, despite being a platform for the creation of wealth; academics highlight the fact that mining groups do not have enough tools to turn those revenues into savings or investments that would gradually improve their quality of life [56]. However, for communities, ASM is valued as a way to reduce poverty and escape from scarcity [54,57].

According to Marston [58], ASM has increased significantly in recent decades; hence the need for regulation of mining activities by regional and local governments, in order to maximize its benefits and address the socio-environmental problems that lead to its existence [53]. However, as mentioned earlier, tax and legislative policies for the development of mining have favored the exploration and exploitation of gold by large companies, with reduced prioritization of projects for the formalization and regulation of ASM [59]; consequently, this type of mining poses various challenges in the framework of sustainable development, in the political, economic, social, and environmental spheres [37].

In LA countries, it is usual for ASM to be found in protected areas with insufficient regulation of its operations [60]. Especially in Ecuador, Perú, and Colombia, where this activity depends on the moors for water capture and regulation, with little consideration for the strategic value of these protected ecosystems, as opposed to mining expansion in the south of the LA continent [61]. In Colombia, the ombudsman’s office [62] has stated that the domestic market for minerals produced with ASM is limited and the volumes that are marketed do not make up an incident economy; therefore, this mode of exploitation involves high costs that miners try to reduce by means of empirical production methods and a high environmental impact. In this regard, controversies arise over the formalization of ASM in Colombia, while the employment opportunities generated are not considered formal due to poor health and safety conditions, along with the fact that the state does not grant access to the fiscal resources caused by this activity [63].

It is important to note that gold mining is part of the structure and tradition inherited for generations in rural communities inhabiting the Complex. Within this framework, the formalization of mining activities in the region must be oriented by the biological and cultural value of the ecosystem, together with the environmental services it provides as the source of water resources for rural and urban areas [64]. It is necessary to recognize that in agreement with the neo-extractivist model, states deny the existence of mining traditions by favoring large corporations [59,65]; consequently, in the attempts to formalize themselves, the mining communities have found little support to implement clean technologies without the use of mercury [60].

It should be noted that when reviewing the scientific literature on the development of ASM in the Santurbián moorland, little information was found on the gold mining activities developed by mining communities in the Complex. This may be explained because, for the most part, the studies focus on the moorland ecosystem, regarding the socio-environmental conflicts that arise from LSM and the environmental impact on the water resources of rural and urban populations surrounding the Complex, as discussion axes on the disputes
between gold and water [66–68]. Likewise, other analyses are oriented to the use of mercury and arsenic in the practice of ASM [69,70].

3. Method

This research refers to a qualitative methodology to recognize subjects from the immediate reality of the phenomenon to be studied, with a holistic orientation [71]. From an ethnographic design, the perspectives of the participants regarding the problem in question were understood, as they need to be interpreted from their own point of view [72]; in this way, lifestyles were perceived in the context of ASM, through the interaction of the research group and the community [73].

3.1. Population and Sample

According to the most recent data, the total population of the territory surrounding the Santurbán moorland is distributed as follows: Vetas (1762 inhabitants), California (1832 inhabitants), Suratá (3520 inhabitants), and Matanza (4499 inhabitants) [74]. In order to establish the widest number of contacts for immersion in the field of study, through fieldwork conducted by and for the people as an ethnographic principle [75], five inclusion criteria were defined to select participants (Table 1).

<table>
<thead>
<tr>
<th>Inclusion Criteria</th>
<th>Age</th>
<th>Economic activity</th>
<th>Place of residence</th>
<th>Time of residence in the territory</th>
<th>Community involvement</th>
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<tbody>
<tr>
<td></td>
<td>18–60 years</td>
<td>ASM, agriculture, or animal farming</td>
<td>Vetas, California, Suratá, or Matanza</td>
<td>Between 20 and 35 years of age</td>
<td>Participants or representatives active in local, municipal, or national meetings on socio-environmental conflict</td>
</tr>
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The population corresponds to miners and peasants, without gender preference, between 18 and 60 years of age. People should be related to the ancestral exercise of the activity of ASM and/or the combination of agriculture or livestock farming to complement their income; likewise, the time of residence in any of the municipalities (Vetas, California, Suratá, or Matanza) should be in the range of 20 to 35 years, since the territory under study has a mining tradition and coexistence with the moorland ecosystem has been present for more than 200 years [76].

The fifth criterion corresponds to community participation, consolidated in collectives or representatives that favor the search for solutions to the socio-environmental conflict from proactive intervention in the process of delimitation of the Santurbán moorland, which will be discussed in the following section. When determining ‘axis variables’, a statistical representativeness was not sought; however, elements were delimited that allowed the conformation of a homogeneous sample, characterized by shared experiences and knowledge that are also culturally validated [77]. In addition, because ethnographic design transcends representativeness to focus on the significance of the population and sample.

One of the researchers established a preliminary approach with a representative of the Community Action Board to initiate the first approaches. Later on, that participant contacted some miners who inhabit the territory. The sample was established in a chain (snowball), contacting key participants who contacted other inhabitants to have them join gradually [78]. The research team determined an intentional sample of 80 people.

3.2. Data Collection and Analysis

The following data collection techniques were used: participant observation, focus groups, and semi-structured interviews. Participant observation is distinctive of ethnographic work. It consists of the interaction between the researcher and the research subject to understand the phenomenon of analysis [79], as well as the social context that constitutes
the object of study [75]. Approaches were made to the ancestral practice of ASM and to the lifestyle of the inhabitants of the moorland in order to achieve a subjective interpretation of the situation from the individual to the collective [80].

While the topic of analysis generates various debates regarding the negative impact of neo-extractivism on the practice of ASM, the focus groups facilitated individual interaction in a group setting; therefore, in each session discussions were generated on the topic of study and a shared vision of the problem emerged [81,82]. The characteristics of the participants are recorded in Table 2, according to the three focus groups that were organized.

Table 2. Characteristics of the community participating in the focus groups.

<table>
<thead>
<tr>
<th>Participant Characteristics</th>
<th>Men: 71.25%; Women: 28.75%</th>
<th>Focus group</th>
<th>Age</th>
<th>Number of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>18–30:</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>31–45:</td>
<td>21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>46–60:</td>
<td>52</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>80</td>
<td></td>
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The semi-structured interviews were used as a complement to obtain specific descriptions of the interviewee regarding the conflict experienced daily by the miners and peasants who inhabit the territory [83]. Four people who have represented the community in the meetings organized around the process of delimitation of the Santurbán moorland were interviewed by using a guide of questions. An open discussion was conducted on their knowledge, experiences, and recommendations on the problem under study. Each person participated autonomously and freely after signing an informed consent.

Regarding the development of collection tools for focus groups and semi-structured interviews, the support of academics with preponderant knowledge in the area was required, especially from an ecological–political context that frames the conflict of interests in the moorland ecosystem; thus, the expert judgment validation technique allowed two researchers to provide concepts and assessments on the questions, in order to adapt it to the field of discussion and estimate its reliability [84]. When conducting the semi-structured interviews, participants were also asked to provide recommendations on the focus group guide, to be considered in future research.

The question guide for each instrument followed three key components: (i) the negative impact of neo-extractivism with respect to ASM; (ii) the formalization of ASM to guarantee the environmental protection of the moorland; (iii) ASM as a model of rural economic development.

An information analysis was performed by using the NVivo software (v12), which resulted in data encoding with node categorization. This allowed for the organization of the units, in accordance with the theoretical–conceptual constructs that guided the study [85]; in parallel, the constant comparison method was used to interpret the information collected by the three researchers, emphasizing the most significant elements [86].

Codes or topics were defined by the attributes and descriptors found in the categories determined. This allowed the research team to define a coding scheme to analyze transcripts and standardize text units [87]. By comparing the results obtained by the three researchers, bias was reduced, and reliability and validity were granted to the collection and interpretation of the data [77]. Figure 2 shows the nodes encoded in NVivo, which were determined by the criterion of information saturation.

Figure 3 shows a word frequency cloud, which defines the scope of the research approach, with the following keywords: moorland, water, Santurbán, delimitation, rights, territory, protection, activities, government, environmental, and communities.
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Figure 2. Node coding (NVivo).

Figure 3 shows a word frequency cloud, which defines the scope of the research approach, with the following keywords: moorland, water, Santurbán, delimitation, rights, territory, protection, activities, government, environmental, and communities.

Figure 3. Word cloud.
In order to grant validity and reproducibility to the study, it was essential to interpret the narratives in accordance with the daily life of the participants; however, the authenticity and validity of the analysis was aimed at understanding the problem posed from different angles, specifically, by means of three types of data: subject protagonist of the object of study, interpretation by the researchers, and the formal methodological–conceptual elements that have been developed on that topic of interest [88]. This method of analysis is known as triangulation, based on the contrast of information obtained with different strategies or from different informants [77,89].

For the present research, a triangulation analysis was made at two times. First, with the interpretation of the data collected by the three researchers, with the three instruments used. Second, by the contrast of information between the perspective of academics who have studied the subject (literature review), the subjectivities and intersubjectivities of the participants (data derived from the collection instruments) [90], and the optics of the research team (interpretation of the analysis). Finally, the results obtained from triangulation were returned to the study participants in order to validate the research directly with the community and receive recommendations for its reproducibility.

4. Results and Discussion

Nine legally established companies operating in ASM of gold and other precious metals are currently based in the Vetas-California mining district; in this way, employment opportunities have been created for inhabitants of the region, in addition to sustaining a mining tradition that, according to the community, dates back to the Chitarero natives who worked in gold mining prior to the arrival of the Spaniards in colonial times.

Regarding the socio-environmental conflict developed in the Complex, through resolution 2090 of 2014, the Colombian government defined the boundaries of the Santurban moorland and demarcated the areas in which mining could be conducted, establishing that out of the 642,473.9 acres making up the ecosystem, 320,601.9 acres would be under protection [91]. Despite this, the community filed legal actions regarding the violation of participation rights and the due process. For this reason, in 2017 through judgment T-361, the Constitutional Court of Colombia ruled that the boundaries of the moorlands should be guided by a stage of consultation with the settlers to define the terms of special protection of the ecosystem [92].

Consequently, one aspect of the delimitation process is a source of concern to the communities, namely, the replacement and conversion of mining activities, since their livelihood would be hindered if not annulled. Although the determination aims to demarcate the moorland zone to guarantee environmental protection, the moorland dwellers feel uncertain and demand that the reconversion is reflected in a guarantee for the formalization of ASM in the region. According to Hook [93], demarcation is essential for miners in extractive activity, so that their profit is based on an inalienable property right; in this regard, formalization represents a challenge, because legal permits must provide adequate working conditions and environmental protection [94].

Taking into account the neo-extractivist currents that have permeated extractive mining in the Santurban moorland and the demands of the community regarding the formalization of ASM, the delimitation process that is carried out in the territory was identified as a starting point to guarantee and optimize the development of mining activities in the region; specifically, since the reconversion ruled by the Constitutional Court.

4.1. Scope of Neo-Extractivism in Formalization Alternatives

According to Svampa [13], the expansion of the extractive frontier in LA results from a mercantilist view of natural resources, originating in colonialism associated with large-scale dispossession and looting. Thus, Lara-Rodriguez [95] highlights that in Colombia, the mining contract includes an extensive bureaucratic process that requires legal, technical, and scientific knowledge, along with an extensive financing capacity; therefore, the structure of the mining administrative sector is designed to privilege LSM. This factor is obvious for
the Complex dwellers, since they state that in the delimitation process the government will give lands to large-scale mining based on the protection of the ecosystem argument.

Pokorny et al. [96] highlight that neo-extractivist policies, as they involve redistribution processes, lead to various problems due to excessive fiscal spending on social programs. The study shows that companies interested in obtaining environmental licenses to operate open-pit mining in the Complex introduce institutional plans to benefit communities; however, for the dwellers, favoring LSM results from the inability of governments to adequately support artisanal miners [97] and the stigmatization of ASM as an economic activity driven by poverty [98]. This is where the supposed incidence of neo-extractivism as a development model is reaffirmed as a force that operates in opposition to the expansion of ASM; mainly, because besides being an economic reference for LA, neo-extractivism has a wide influence on the political and cultural dimension of development that ultimately converges in domination [10].

In this order of ideas, neo-extractivism has become a contemporary version of development in LA [50], which is why the participants stress the importance of highlighting the positive scope of ASM in their territory, as a mode of resistance against the strategic actions of ruling groups and classes that exacerbate conflict on the use of resources [51]. In the African context, ref. [99] states that this model has been evaluated and implemented in the political agendas of Tanzania, with a similar agenda in terms of the interests that guide the neo-extractivist model and its influence in LA. In Africa, the scope of extractivism shows similarities with what is happening in the Santurban moorland.

Regarding the above, just like the dwellers of the Complex, participants in studies carried out in sub-Saharan Africa reveal that when confronted with LSM, licensing attempts are reduced, and formalization is discouraged. They also recognize that governments justify the lack of resources and ignore the contribution of ASM to community development [100]. The moorland communities believe that the consultation process for the delimitation did not have enough guarantees of participation and it was observed that there is distrust with respect to the final decisions of the national and regional government. In this regard, Hook [93] found that for artisanal miners in Guyana, the state perceives ASM as disorganized, it criminalizes its action and places them as an accomplice in corruption activities that exacerbate socio-environmental damage.

4.2. Formalization as an Alternative Solution

While neo-extractivism strengthens extractive activity in LA and consolidates LSM through capital investment, ASM demands special attention and great challenges, insofar as it integrates the rural economy while keeping connections with agriculture [98]. Therefore, it is necessary to concentrate on the discontent of the dwellers about the management of the socio-environmental and economic problems of the sector with respect to certain actions or omissions by the national government, given that their voices began to be heard in the process of delimitation of the moorland just four years ago. As they state:

*We do low impact mining; if we are going to talk about impact, we are small mining companies, and all our lives we have done mining in the same area* (Group 1).

*Through small-scale mining we want to transform the future of Colombia, and we are convinced that it is responsible mining. We have the strength, intelligence, and knowledge to get mining to be productive* (Group 5).

*The interests of the international countries in the Santurban moorland are not only about the water, but also about the mineral that is here* (Group 7).

It should be mentioned that article 344 of the Mining Code sets out the functions of the Mining Policy and Regulations Advisory Council: (i) “it recommends to the National Government the policy and mechanisms for coordinating the activities of all public and private entities and bodies whose functions affect or may affect the mining industry”, (ii) “it makes recommendations to ensure sustainable development in the extraction, processing and use of mineral resources” [101]. In this way, the political functions of the government...
are determined in the face of the sustainability of mining development and related entities surrounding the mining industry.

It is worth clarifying that Africa presents the most precise references in terms of formalization; thus, in sub-Saharan Africa, the debates on this process started between the 1980s and 1990s [98]. In Kenya, there was silence regarding the situation until 2016, and Tanzania has the most advanced government formalization policies in the region [102]. In this study, the participants urgently demand the regulation of ASM because the National Policy for the Formalization of Mining created in 2014 is insufficient and limited for the moorland context.

When analyzing the information collected, several similarities were found with the African context and with other countries in the global south that made it possible to identify the components that favor the formalization of ASM based on real experiences and difficulties. First, the miners find the government’s economic interests as contrary to improving their quality of life [103]; therefore, it is considered necessary to overcome the confrontation or denial of ASM, a factor that does not help to solve the problem and exacerbates the economic crisis [104].

Second, the frustration of the inhabitants regarding the lack of precision in government decisions is obvious, since officials claim that the efforts of the institutions are aimed at increasing the fiscal control of the sector [105]. However, they do not have a defined path to formalize ASM [98]. In this sense, according to the testimonies of the moorland miners, financial and technological assistance should begin with a change in the narratives related with ASM and its operators [97].

Thirdly, the development of mining companies in the territory was possible after decades of entrepreneurship, added to the work performed for LSM organizations. As a result, Verbrugge [106] found that in the Philippines the formalization of ASM is divided among the dominant companies that benefit from the persistence of informality to take advantage of the excluded and exploited workforce and of the groups of miners who experience inequality and poor guarantees. To this end, access to formalization in the Complex implies the improvement and innovation of extractive activities. Therefore, the fourth point refers to the limitations of assistance and the prioritization of the formalization process, mainly, due to legal requirements which are difficult to interpret [107].

In this sense, Hilson et al. [108] point out that miners have limitations in the formalization process due to factors such as bureaucracy, excessive registration costs, and competition for land against large mining companies; hence, systematic exclusion patterns prevent miners with little resources (the majority) from accessing land [103]. A determining element in the Santurbán moorland case is linked to the commitment of communities to the protection of the ecosystem. According to the perception of some interviewees, there is awareness on the importance of eliminating mercury; therefore, it is essential for inhabitants that the knowledge built through generations is sustained over time and contributes to the exercise of responsible mining.

In this way, the fifth component is related to the environmental protection of ecosystems, in order to mitigate the environmental impact resulting from extractive activities. In this respect, as revealed by the settlers as miners, they have a sense of belonging and ownership over the territory that has become their main source of support; it is, thus, essential that ASM is formalized [104]. According to Kinyondo and Huggins [109], within the framework of sustainable development (SD), ASM should have significant relevance; especially in the design of environmental management plans that are built through formalization. This shows the interest of miners in the Complex to improve their environmental management through training sessions, monitoring, and financial support.

The five elements mentioned are complementary and they have been evaluated in local life contexts in which ASM has social, environmental, and economic implications [96]. In this sense, emphasis on SD is linked to the ways in which rural and urban communities related to the moorland ecosystem express concerns about the environmental impact of LSM and ASM. In this regard, Huntington and Marple-Cantrell [110] outline that concerns
about the consequences of extractive activities are stronger in areas with traditional rules that require government regulation. For this reason, it is essential to formalize ASM in the Complex, supported by the delimitation process and, therefore, the reconversion of extractive activities.

5. Conclusions

The purpose of this paper is to analyze the negative impact of neo-extractivism to boost the mining industry and the components that prevent the formalization of the ASM as a model of rural economic development in Vetas, California, Suratá, and Matanza. It is concluded that the neo-extractivist model operates in opposition to ASM, especially because of the economic interests that mediate access to land and the traditional administrative structure that privileges multinational companies that run LSM.

The communities of the municipalities surrounding the Santurbán moorland have made the greatest efforts to prioritize the process of formalization of ASM in the territory, mainly in the search for environmental protection of the Complex; however, despite the efforts to generate alternative solutions to the socio-environmental conflict that was exacerbated with the delimitation of the moorland ecosystem, local, regional, and national authorities have minimized the problem and reduced the conversation to the exchange of natural resources by capital.

It is important to understand that the negative impact of neo-extractivism extends to limiting or preventing the formalization of ASM, mainly due to the stigmatization of artisanal work, the structure of the mining sector that privileges LSM by granting licenses in exchange for favors, the wide influence of the political dimension, and ignorance of the contribution of ASM to community development. Consequently, it is essential that the delimitation process ends with the demarcation of the territory in order to guarantee the continuity of a centuries old artisanal mining tradition in the region.

This solution measure involves different challenges, since the elimination of ASM justified as environmental protection does not guarantee that the large-scale and open-pit mining industry will ensure the conservation of the Complex and the economic stability of the communities that depend on ASM. In this regard, it is essential to legitimize the participation of the inhabitants, and their knowledge and experiences of territorial life, with the purpose of suppressing stereotypes and stigmatization of their economic activity.

In the midst of the conflict of interests between the political sectors that seek to promote neo-extractivism as the only alternative for the development of the mining industry, and the communities surrounding the Complex that favor the formalization of ASM, it is a priority to interpret the economic, social, and environmental reality of the territory and to implement actions that guarantee rural economic development through the recognition of the artisanal-traditional sector, the creation of companies and associations, financing, training, and access to marketing and technology with training [104]. In addition, it is necessary to achieve a formalization pattern that adapts to the adjustments and systems that the settlers have historically established [111].

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