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SOCIAL REPRESENTATIONS OF MINING ACTIVITY IN THE HIGH MOUNTAIN ECOSYSTEM "PÁRAMO DE SANTURBÁN" (SANTANDER, COLOMBIA)

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PRESENTS:

DIANA PAOLA ORDOÑEZ COBOS

CO-DIRECTOR OF THESIS PMPCA

DR. MIGUEL AGUILAR ROBLEDO

CO-DIRECTOR OF THESIS ITT:

DR. JUAN CARLOS TORRICO

ASSESSOR:

DR. PROF. JOHANNES HAMHABER

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Erklärung / *Declaración*

Name / *Nombre*: DIANA PAOLA ORDOÑEZ COBOS

Matri.-Nr. / *N° de matricula*: 11090034 (CUAS) and 0204034 (UASLP)

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Paola Ordoñez C.

ABSTRACT

Páramo de Santurbán (PS) is a high mountain ecosystem of the State of Santander in north-eastern Colombia which has two main features: it provides water to an estimated population of 1.7 million people of 21 different municipalities, including two important cities; and it has also great deposits of mineral and precious metals -like gold and silver- which explains the presence of small-scale traditional mining as well as mining multinationals. This creates a tense situation between various social actors.

This qualitative study aims to analyze the Social Representations (SR), that is to say, the cognitive elements and the attitudes assumed by the stakeholders related to mining in PS in order to contribute to a better understanding between them. The studied groups are the opinion leaders, the multinational mining companies, traditional miners and community members of California and the environmental authorities. The sample selection was carried out through literature review and the tools known as *judgment* and *snowball* sampling. 21 in-depth interviews have been conducted and systematized by the adaptation of the Grounded Theory and the qualitative software *Atlas Ti*. The corresponding analysis had two stages complemented both by the Social Representations Theory and the Social Construction of Reality. The first one has explained the content and structure of the SR, while the second one has defined them in terms of their dimensions: information, field and attitude.

The study concludes with a comparison of the core elements of the stakeholders' SR. A high amount of re-signified scientific knowledge was observed within most of the studied SRs. Likewise, the hierarchical organization of the SRs has revealed the privileged place of the element water and the variety of its meanings depending on the context of each group. Some feelings and emotions influencing the attitude of the groups towards mining in PS are: fear, uncertainty, mistrust and resignation.

Keywords: Gold mining, High Mountain Ecosystem, Páramo de Santurbán, water, stakeholders, social representations theory, Santander, Colombia.

RESUMEN

El Páramo de Santurbán (PS) es un ecosistema de alta montaña localizado en el departamento de Santander, Colombia. Cuenta con dos características fundamentales: regula el ciclo hidrológico, suministrando agua a una población estimada de 1.7 millones de habitantes de 21 municipios incluyendo dos grandes ciudades; y posee vastos depósitos de minerales y metales preciosos como el oro y la plata, lo cual explica la presencia de minería tradicional a pequeña escala y multinacionales mineras. Esto genera una situación de tensión y conflicto entre varios actores sociales.

Así, el objetivo de la presente investigación cualitativa es el análisis de las representaciones sociales (RS), es decir de los elementos cognitivos y las posturas asumidas por los actores involucrados en la minería en el PS (líderes de opinión, compañías mineras, mineros tradicionales y comunidad californiana y las autoridades ambientales) y contribuir así a un mejor entendimiento entre ellos sobre su situación. La selección de la muestra se hizo a través de revisión documental y de las herramientas denominadas de *juicio* y *bola de nieve.* Se realizaron 21 entrevistas a profundidad, cuya información se sistematizó con ayuda de una adaptación de la Teoría Fundamentada y el software de análisis cualitativo *Atlas Ti*. El correspondiente análisis tuvo dos etapas, complementadas todo el tiempo con la Teoría de las Representaciones Sociales y la Construcción Social de la Realidad; la primera de ellas explica el contenido y la estructura de las RS y la segunda las define en términos de sus tres dimensiones: la información, el campo de la representación y la actitud.

El estudio concluye con una comparación entre los elementos del núcleo central de las RS de los actores involucrados, en donde se pudo observar un alto grado de conocimiento científico re-significado. Así mismo, la organización jerárquica de las RS demostró el lugar privilegiado que ocupa el elemento agua y la variedad de sus significados dependiendo del contexto de cada grupo. Algunos sentimientos y emociones que pudieron influir en la actitud de los grupos hacia la minería en el PS son: temor, incertidumbre, desconfianza y resignación.

Palabras clave: minería del oro, ecosistemas de alta montaña, Páramo de Santurbán, agua, partes involucradas, teoría de las representaciones sociales, Santander, Colombia.

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Acronyms and Abbreviations

CDMB	Corporación por la Defensa de la Meseta de Bucaramanga Autonomous Regional Corporation for the Defense of the Bucaramanga Plateau
EIA	Estudio de Impacto Ambiental Environmental Impact Study
HME	High Mountain Ecosystem
IAVH	Instituto Alexander von Humboldt Alexander von Humboldt Institute
IED	Inversión Extranjera Directa Foreign Direct Investment
LA	Licencia Ambiental Environmental License
MCDPS	Movimiento Cívico por la Defensa del Páramo de Santurbán PS Citizen Movement
PS	Páramo de Santurbán
SINA	Sistema Nacional Ambiental Environmental National System
SR	Social Representations (SRs)
SRT	Social Representations Theory

INTRODUCTION

In Colombia, as in many countries around the world, there has been a growing increase in the promotion of the mining industry considering it as one of the main economy boosters. Former and current governments have developed a number of incentives to this sector in order to increase the international investment.

According to recent data, Colombia has 5.259.645 ha. in 9.439 mining titles granted to mining exploitation, from which 2.312 are gold titles. Approximately 16% of the mining titles are located in the State of Antioquia, followed by 15% in Boyacá, 11% in Cundinamarca, 8% in Norte de Santander and 6% in the State of Santander. Under this measure, 37 mining titles are also in the areas of National Parks and High Mountain Ecosystems, called Páramos (Marín & Londoño, 2013).

This case study will focus on the gold mining activity specifically developed in the immediate vicinity of the Páramo de Santurbán (PS) which is a high mountain ecosystem of the State of Santander in north- eastern Colombia and that provides water to an estimated population of 1.7 million of 21 municipalities , including two important cities (Bucaramanga and Cúcuta). Recently, 11.700 ha were declared as Regional Natural Park from its 82.664 ha but 29 mining titles are inside of the delimited area (Londoño, 2013).

Moreover, a number of existing legal instruments determine the “páramos” as protected areas and therefore as areas excluded from any productive activity, included mining.

This inconsistency of promoting mining and at the same time preserving a high valued ecosystem has generated social, environmental and political confrontation, since the main ecosystem service supplied by the PS, that is to say water, is equated with the profitable mineral of gold, embedded in the mountains. This has contributed to polarize the social situation and to make stakeholder dialogue a very difficult task.

Accordingly, this introductory section presents the general aspects of the research. This thesis analyzes from a qualitative methodology, the different social representations (ideas, images, perceptions and attitudes developed by social actors) by the PS stakeholders involved in mining

activities. The thesis aims to clarify the subjective social reality of this phenomenon and contributes to the understanding and development of work plans focused on benefiting the region and its people.

The conceptual approach to achieve this purpose is the Social Representations Theory formulated by social psychologists and complemented by various authors through the years, and is addressed in the first chapter dedicated to the conceptual framework together with the social construction of reality developed by Berger and Luckmann.

To be able to respond to the proposed objectives of this research, a qualitative methodology has been selected and presented in the second chapter. It consists in the organization of secondary information regarding mining in PS, issued from December 2009 to March 2013 and finalizing with a short stay in the city of Bucaramanga and in the municipality of California in July 2012. The organization of the literature review was decisive for the sample selection, which was applied through the tools *judgment* and the *snowball sample* (Marshall N., 1996). In order to collect the primary data the study has chosen the application of in-depth interviews during March and April 2013. At the end 21 of them were done and organized by the adaptation of the *Grounded Theory* and the qualitative software *Atlas Ti*. The corresponding analysis had two stages: the first one explains the content and structure of the SR and the second one defines them in terms of their dimensions: information, field and attitude.

Moreover, the third chapter focuses on the case study background, whose general aspects of Colombian mining sector will be addressed, for instance the mining rights, mining profitability and the recent legal amendments that led to the current mining “boom”. The national context ends up with a brief description of the types of mining that the Colombian legal system recognizes and the main environmental and social impacts of gold exploitation. Those are topics that serve as a preamble to the specific features of the case study.

Consequently, the relevance of the High Mountain Ecosystem of Páramo de Santurbán and the review of the mining activity in this region will be addressed in the fourth chapter, which concludes with an overall view of the social, economic and political context linked to large mining in PS.

In general, 16 actors from the national, metropolitan and municipal scales were identified, out of which 4 stakeholder groups were chosen to be studied: opinion leaders, multinational mining companies, traditional miners and some members of California community and the environmental authorities. Their social representations showed a conceptual versatility insofar as the common core elements between them have different interpretations and meanings. The study concluded with a comparison of the core elements of the stakeholders´ SR in chapter 5. A high amount of re-signified scientific knowledge was observed inside of most of the studied SRs. This thesis concludes by saying that, the hierarchical organization of the SRs has showed the privileged place of the water element and the variety of its meanings depending of the group context. Some feeling and emotions influencing the attitude of the groups towards mining in PS are: fear, uncertainty, mistrust and resignation.

Problem Statement and Justification

Mining has been developed since pre-colonial times in PS and several multinational mining companies have operated in this area after the arrival of the Spanish conquerors, so that the precious metal in their mountains is the reason for the existence of the revealing municipalities of California and Vetas. Moreover, for more than a decade, the central government has implemented strong policies aimed to increase the national economy through foreign investment, especially in the mining sector[1]. The most recognized mining company in the region since 1995 has been Eco Oro Minerals Corp, formerly known as Greystar.

Nonetheless, the described situation is occurring in a “páramo”, a high mountain ecosystem (HME) that is present only in 5 Latin America countries in the world and probably because of that, the word “páramo” does not have a single translation to other languages. Colombia has approximately 50% of them and their main skill, the regulation of the hydrological cycle, is benefiting around 70% of Colombian population (IAVH , 2007).

The Angosturas mining project submitted by Eco Oro in December 2009 in order to request the Environmental License (LA), was intended to be the first open pit gold operation in a HME in the whole country. This situation has set off the social alarms and since then until now, regional and national eyes have been put on the PS and its mining future. By the same way, many social

[1] This is what the Government has named the Foreign Direct Investment (IED).

organizations were formed to express the public disagreement with the mining project, as it can be seen by the countless marches, public hearings, television specials, forums, debates in Congress and the publications of very few academic documents, among others events that led to the denial of the LA and the rename of the mining company.

In addition to the above mentioned, the lack of academic works related to this particular case study is also a reason for undertaking this project.

The debate is still on the table because Eco Oro is only one of the mining enterprises located and interested in the enormous quantities of gold of PS and the results of this controversy will define the sustainable development model of Colombia for the next years, particularly because this representative mining case implies the constant confrontation for the protection of a high sensitive ecosystem with the supposed progress that mining brings to an specific region.

Other relevant gold mining cases have been evaluated by national authorities in order to grant/deny the Environmental License and are located in environmentally strategic areas such as: La Colosa, Tolima (mining versus agriculture); Marmato, Caldas (people replacement) and Parque Yaigoje, Vaupés Amazonía (mining versus Natural Park and ethnic communities) (Revista Semana, 2011).

Recently, the social polarization of the zone has increased due to the declaration of the Regional Natural Park PS in January 2013; since it prohibits any productive activity and until now it does not propose alternative livelihoods for the thousands inhabitants of California and Vetas municipalities. It is worth to mention that the delimitation of the park has left out the most important mining titles owned by the big companies.

Thus, the above mentioned social polarization, the ongoing controversy, how relevant this matter might be for the country and the necessity of an efficient regional planning of PS, make dialogue indispensable between the stakeholders. They have personal, rooted and different views of mining in PS and it is necessary to know them in order to contribute to a better understanding of their current reality and therefore to the elaboration of consensus. Divergences and convergences need to be unveiled, which is possible through the theory of the Social Representations and could be

also very useful for this region in terms of recognizing the voice, imaginaries and attitudes of the stakeholders of mining in PS.

Research Objectives

General Objective

Analyze the social representations of mining activity in the high mountain ecosystem "Páramo de Santurbán" (Santander, Colombia)

Specific Objectives

1. Identify the stakeholders involved in mining activity of the study area.

2. Explain the main representational contents and the structure of the social representations.

3. Discuss the mining activity in the PS in terms of the studied social representations and the local and national mining context.

The mining situation in PS involves an extensive range of stakeholders from local up to the national scale. Their identification will define the actors to be interviewed and their interference in the studied phenomenon.

The social representation shared by each social group about mining in PS is composed by concepts and ideas organized in a structure *i.e.* the social representation has a core and peripheral elements which have an influence on the attitudes adopted by each stakeholders towards the current mining activity in PS and that might be known in order to find similarities and a point of agreement.

The explanation of the social representations by itself is not enough; it should be complemented with the interpretation process, which in turn is related to the social, economic and political situation from the local and national scope. The explanation and interpretation moments should

reflect, in the respective context (reality), the subjectivity of each stakeholder, which is also crossed by the subjectivity and individual reality of the researcher.

Limits of the Research

The limits of this master thesis respond to a number of aspects that the reader should take into account when approaching to this study. They refer to the time, space and methodology and are mentioned below:

- As stated, mining in PS is a current matter in Colombia and therefore, news and related information are published daily in regional and national media. This situation makes it difficult to build a complete and updated picture. Thus, it is important to have in mind that the social, political and probably environmental phenomena described in this research will reflect a particular moment of Colombian history and should be complemented by further information in the future.

- A broader research of social representations of mining activity in PS requires the involvement of all stakeholders. Unfortunately, this was not possible due to the timeframes of field work, the insufficient logistical and human resources, and limited available resources for financing the research. Nevertheless, the study involved the participation of relevant actors who are presented in the successive chapters.

- The thesis results are referred only to this case study and they may be not extrapolated to similar situations, since they are framed into the qualitative approach and therefore the inductive processes. However, the methodological strategies, sources and complementarity of methods, as well as their application in mining contexts, might be considered by other research projects carried out.

- In this regard, it has to be taken into account that the interpretation processes of the research are widely crossed by the subjectivity of the author, her own reality and her own SR of mining in PS.

CHAPTER 1 THEORETICAL AND CONCEPTUAL FRAMEWORK

This chapter shows the theoretical base for this research, which has been built from the assumptions of Berger and Luckmann (2011) regarding the **social construction of the reality** and a number of authors who complement the Theory of Serge Moscovici about the **Social Representations**. The collection of the information and its subsequent analysis were developed in light of these theories.

1.1 Social Construction of Reality

The society exists both as subjective and as objective reality and must be understood as a continuous dialectic process composed by three moments: externalization, objectification and internalization (Berger & Luckmann, 2011).

Externalization: It is the constant process whereby humans produce subjective meanings. We[2] produce objects, our socio-cultural world (human environment) and therefore our **social order** is a set of products we continuously create and, at the same time, this world is giving us shape in order to make us humans. We are humans, since we are members of a society and part of the entire humanity. Two main aspects should be understood from the self-experience: the person **is** a body and she/he **has** a body at her/his disposal. The externalization refers to the **products** of the human activity; being these the way how we as human beings externalize ourselves. The social order that we generate give us organization, direction and stability (Berger & Luckmann, 2011).

Objectification: This is the process whereby the externalized products of the human activity reach the character of **objectivity**, for instance language as the most important system of signs. The everyday life is full of objectivities, since it would not be possible without them. Those "objects" claim the subjective intentions of the others; even though sometimes is difficult to know surely what a particular object exactly proclaims. The objectivities are presented as an external fact and

[2] This process is possible only by the society, by a social enterprise, humans together and not by a single human being.

they have a coercive[3] effect on the person. Likewise, the objectification is the process that sustains the existence of the **institutions** which are a creation of objectivized human activity (we create them). When we speak about institutions is needed to highlight the coercion and the mechanisms of social control (also exercised by the "**roles**"[4]) exerted over the new members of the society and over the current audience, who benefits from the cohesion (Berger & Luckmann, 2011).

Internalization: It refers to the (unfinished) **socialization process** of becoming a new member of a society[5]. This is about the time when she/he apprehends or interprets immediately an objective event, since it becomes meaningful for her/him. That is to say, the internalization is the base of the understanding of the other members and of the apprehension of the world as a meaningful and social reality, my reality. Society, **identity** and reality crystallize subjectively during that moment on the conscience, thus establishing a symmetric relationship between the objective reality (social) and the subjective reality (individual). A successful socialization process happens when: What is real "outside" is also real "inside", despite of the fact that the first reality (the objective reality) is and will always be bigger than the subjective. This is due to the content of the socialization, which is determined by the distribution of the knowledge.

It is important to mention that the objectification and the internalization are moments of a continuous dialectic process.

Thus, the **reality** is conceived by Berger and Luckmann as a quality that is proper of the phenomena we recognize as independent of our actions. We cannot make them disappear. On the other hand, the **Knowledge** is the certainty that the phenomena are real and that they have specific characteristics.

All the above affirms the mentioned assumption in which the reality is socially constructed, since, as we have seen, the distribution of knowledge is uneven and it is consequently what makes it

[3] Coercion refers to the strict rules of the objectified products, such as the roles and the institutions. Our language, for instance, has a word in our social group to name a thing/object and I am not allowed to use another word to do it, not until the others know.

[4] Roles represent the institutional order.

[5] The primary socialization starts when we are in the early years of life. The young child or baby understands and internalizes the world as THE world, the single one existing to be conceived. Later, an individual can experience secondary socializations, but those worlds will not be internalized in the mind with such determination as the first one (Berger & Luckmann, 2011).

possible the existence of different realities fed by one single. The specific accumulations of reality and knowledge belong to specific **social contexts**.

These social contexts are our everyday life (the supreme reality is the everyday life), where our conduct is guided by a particular type of knowledge: the **common sense.**

Common sense: It is an inter-subjective world that a person recognizes in her/his socialization process as something given before she/he was there and that she/he shares with the others. The common sense has significance for each one of the members and it organizes the reality of the everyday life, of MY particular everyday life. In other words, the knowledge of the **common sense** is what the person shares with the others in the normal and self-evident routines of the everyday life.

However, it is worth to mention that many **conflicts** emerge when two or more types of common senses towards a phenomenon appear, since the projects of a person/group are not only different, which is normal, but also opposite.

The social interaction in the everyday life is mostly experienced face to face and it is guided through reciprocal **typifying schemas.** However, with those who the person does not have a face to face experience, the anonym typifying is represented by the *social structure*.

Finally, the most important vehicle for sustaining reality is the DIALOGUE and mainly the casual one and mostly used in everyday life.

1.2 Social Representations Theory

According to Farr (1984) cited by Araya (2002), Social Representations (SRs) are organized cognitive systems where the presence of stereotypes, opinions, beliefs, values and norms can be recognized. These *socio-cultural products* constitute a set of general assumptions that exercise an influence on the attitudinal orientation, making it positive or negative towards something. They are part of the primary knowledge, from which everyone in that society is aware of. In other words, SRs are coded systems, values, classificatory logics, guiding interpretive principles and

practices, which define the so-called **collective consciousness.** The collective consciousness establishes the limits and the possibilities of the way how women and men act in the world. (Araya Umaña, 2002) The collective consciousness could be understood in part in words of Berger and Luckmann (2011) as the institutions created through the objectification process, which defines the roles and ensure their existence by coercion.

Thus, as Farr (Farr, 1984) noted, cited by Araya (2002), the SRs have a **dual function**: the first one is to **establish an order** that allows individuals to orient themselves in their material and social world to be able to master it. The second one is **enable the communication between members** of a community by providing a code for social exchange and a code for naming and classifying unambiguously the various aspects of their world, their individual and group history. Following the assumptions of Berger and Luckmann (2011), the function that sets the *social order* could be included into the *externalization* moment, while the second function could refer to the *objectification* moment, even though the social representation theory does not mention the difficulties regarding the subjective interpretations.

Likewise, the SRs make the unknown into something familiar, because they **re-signify the SCIENTIFIC KNOWLEDGE through common sense** (could be understood also under the appreciations of Berger and Luckmann) and vice versa giving to the reality a practical sense. This re-signification process occurs specially in our modern societies where the media are constantly spreading concepts, theories and new ways of explaining life. To make those scientific elements become useful in everyday life, societies have to integrate them into the functional or common knowledge they posse, which is the common sense (Mora, 2002).

Thus, it is very important to mention that the SRs do not have a universal character, since they depend on local factors and characteristics that are close to each social group (Social contexts). They are also social constructions with a dynamic character that means that they change over time, depending on each subject's personal experience and generational time.

The **scientific knowledge** possessed by experts (insiders) and its dissemination with the public (outsiders) embraces also a matter of **power** that the experts are usually aware of and based on that they decide how much power they want to share (Bauer W & Gaskell, 1999).

Each one of these social constructions has **a content** (information) and **a structure** (organization of that information), where it is possible to identify **core** and **peripheral elements**. The core is defined as the set of elements that provides consistency and global significance to all other peripheral elements of the SR and it is therefore also the most resistant to change.

In order to understand the integral relations and composition of the SR, this theory has developed two approaches: The **processual** (procesual in Spanish) and the **structural**. On the first hand, the processual approach examines the content of a SR through the collection of discursive material taken from interviews, questionnaires and documents. After having this information, several techniques are applied in order to analyze the content. Thus, the process is supplemented not only by the triangulation of techniques, but also by the connection of theories and related researches. This approach refers primarily to a hermeneutic qualitative analysis (Araya Umaña, 2002).

On the other hand, the structural approach (Abric, 1994) focuses not only on the **content** but also on the **structure** of the SR. The elements of the SR are ranked and presented so that it is possible to identify an organization that shows the relationships between those elements and therefore determines the single position of each of them in the SR. The techniques used by this approach are correlational and multivariate analyzes of similarities and correspondences (Araya Umaña, 2002).

According to Moscovici, SRs may be analyzed from 3 dimensions: The **information** of the SR, the **field of the representation** and the **attitude** that the RS is influencing (Mora, 2002).

1.2.1 Methodological Techniques used by the Social Representations Theory

According to Araya (2002), the methods and techniques used by the SRT are decision of the researcher, who chooses some of them depending on the research´s objectives, the available time and the technical and personal sources for gathering all the information. They will be very briefly presented below:

Data gathering techniques of the SRT

- Interrogative techniques: **In-depth interview**, questionnaire, inducing tables.

- Associative techniques: free associations (made from a trigger-concept provided by the researcher), associative letters (associative chains made from a trigger-concept provided by the researcher).

Methods to identify the organization and structure of the SR

The following techniques are used as a complement of the exposed above.

- To identify the connections between the elements of the SR: Construction of pairs of words (studied person makes pairs from the words that are result of the associative techniques), paired comparison (studied person makes pairs from the words that are result of the associative techniques and compares them), constitution of sets of terms (studied person makes sets of words and explains why the groups).
- To hierarchize the elements: successive hierarchical items (the studied person builds groups of words from the most related items to the phenomenon.) and the successive elections by blocks (the items related to the phenomenon receive a numerical variable).
- To control the core of the SR: Questioning the core of the SR (Text elaborated by the researcher from the results of the applied techniques and extra information in order to ask the studied person about the maintenance of the elements in the SR), "Inducción por guión ambiguo" or induction by ambiguous script (identification of recurring concepts in a text elaborated by the studied person) and the technique of the cognitive schemas (studying of the relations between the results of some associative techniques).

Analysis methods and techniques of the SRT

- **Grounded Theory analysis** or constant comparative method: It explains and describes at the same time through the open, the axial and the selective codification
- Analysis of the information source: It detects the sources of the information that can be personal experience, role-play, social communication, observation, media, and scientific knowledge
- Graphic analysis of the signifiers: it applies to discourses.

1.2.2 Studies of Social Representations and Environmental Sciences

From its inception in the 1960s by Serge Moscovici, based on the theoretical contributions of the ethno-psychology of Wilhelm Wund, the symbolic interactionism of George Herber Mead and the concept of collective Representations of Emile Durkheim; the SRT in Latin America has focused on 3 areas: Education, health and politics. Further, the study of the SRs has impacted researches of environmental sciences since the 1990s, especially in Brazil, México and Venezuela; countries where until 2008 over 15 academic researches related to this theory and its application on environmental sciences had been produced. Marcos Reigota (1990) cited by Calixto (2008) in one of these studies divided the SRs of the environment into three groups: naturalist, globalizing and anthropocentric. After him, The SRT has been more and more integrated into research mainly linked to the environmental education and the improvement of its applicability (Calixto Flores, 2008).

Of particular interest was the study of the SR of the Cajamarca women (Peru) about the environmental contamination due to gold mining, which pointed out the worsening of social marginalization of this population group by the environmental deterioration (Arana Z., 2005).

1.3 Conceptual framework

In the light of the foregoing, the conceptual framework of this research reconsiders some terms sustained by Berger and Luckmann (2011) and two theoretical constructions of the SRT such as guiding principles in data analysis and interpretation.

Social representation: Cognitive systems shared among a social referenced group in which stereotypes, beliefs, values, prejudices, signs and other social-cultural products of a specific social context about mining in PS may be recognized in an organized and hierarchical form. Altogether they are exercising an influence on the attitude´s orientation (negative or positive) that the stakeholders are assuming towards mining activities. The representation about mining in PS needs to be developed, because it is becoming a bigger issue and it is earning a place into the everyday life conversations between the members of a social group, which forces them to take a position or side.

Reality: Based on the purposes for the study, reality can be described as a consequence of a dialectic social relation process that can be possible through the moments of *externalization*, *objectification* and *internalization* and is finally perceived by the individuals as an objective and external social world that is independent of our actions. The reality is constructed by social groups, and at the same time reality constructs them back too. The sense and character of that reality is understood and explained through knowledge, specifically the knowledge contained in the SRs of the studied stakeholders.

Common sense: This term is strongly linked to the previous ones because it is the SR and reality´s substance. In this case study, the common sense is composed by the core elements of the SRs since they are the foundations on which the whole SR, the attitude and the reality of the specific social contexts are based. It is what coordinates and regulates the everyday routines of the social actors.

Scientific knowledge: This is also a constructed reality that has gained the connotation of objectivity inasmuch as it has been endorsed by the institutions, in this case by the academic institution. Besides, it is perceived as "objective" because it can provide some answers to different realities. It has been presented to this generation as a historic and objective reality and this is also how it will be internalized by the next generation. However, it does not mean that it cannot be modified by our (social enterprise) actions or that it cannot be opposite. This type of knowledge differentiates itself from the **primary knowledge**, from which everyone in a particular society knows. This latter is composed by *socio-cultural products* (beliefs, values, myths, etc.) and is located in the pre-theoretical level.

Regarding the SRT it is important to consider: On the one hand the **processual and the structural approaches** of the SR in an attempt to explain the content and structure of each one of the RS; on the other hand, the **dimensions of the SR** defined by Moscovici cited by (Mora, 2002) (information/knowledge, field of the representation and attitude) to carry on the joint analysis of the studied stakeholders´ resulting SRs.

The **processual approach** lies in qualitative statements and pays especial attention on the interactions in the society. Likewise, this approach analyzes the social and cultural aspects that are immersed in a specific context. The importance of the context is mentioned by (Rodríguez Salazar, 2011) who sustains that the social contexts in which the individuals interact affect the meanings, the practice, and the creations about what is a priority and what a banality. It can be identified through discursive material and should clarify the content (information) of the SR.

The **structural approach** focuses on the cognitive performance and the way how the content is organized into the SR. The **core** and **peripheral elements** are visualized and organized around the object of the SR. As said before, the core is defined as the set of elements that provides consistency and global significance to all other peripheral elements of the SR and it is also the most resistant to change. The peripheral elements are directly connected to the core elements and are hierarchized depending on how close they are from them. Apart from illustrate and clarify the meanings, peripheral elements also justify them (Araya Umaña, 2002). Needless to say that these elements are also dependent on the context and that they are in charge of protecting the core from change; if they are weak and not very resistant, they can lead to a transformation of the core which occurs anyway, but slowly (Ibid).

The **dimensions of the SRs** will be applied in the chapter 5 to realize the joint analysis of the resulting SRs.

Information/knowledge: It refers to the organization of the knowledge that the group has about the mining in PS and where it can be distinguished the amount and the quality of information as well as the possible existence of stereotypes, prejudices and knowledge without explicit source or support. These are also revealing the presence of the attitude. In this respect, the group membership and the social location are essential to determine the amount and the precision of the available information. Finally, the source of information must be considered, since the properties of the information obtained from personal experiences with mining in PS and the information from the media or the science are very different (Araya Umaña, 2002).

The information is contributing to the explanations of the reality (Mora, 2002). In this case, it contributes to the explanation of mining reality of the stakeholders in PS.

Field of the representation: This expresses the organization of the content of the SR in a hierarchical structure varying from group to group. It allows visualizing the character of the content, the qualitative and imaginative properties in a field that integrates information in relationship with the immediate sources. (Araya Umaña, 2002) Banchs cited by Mora (2002) adds to this matter the need for seeing the whole actors´ discourse about the object (mining in PS) and not only a phrase in order to address the global character of the representation.

Attitude: This dimension concerns the orientation of the persons´ conduct which invigorates and regulates his/her action. The attitude can be identified in the discourse through the linguistic categories that have a positive or negative meaning towards the studied phenomenon (mining in PS). This is the most evident dimension and contains the most affective aspect of the representation since it has the emotional reaction towards the object. It is insofar always present in a group, as it is possible to have an emotional reaction based on little or no information about a particular object/fact, even though the other dimensions are absent. Mora (2002) citing Moscovici, affirms that this dimension could be also the first to come out and that is the one influencing the person´s motivation to search information about the object. Cultural values are essential in order to judge an object/situation/person and are always the responsible of the attitudinal orientation (Parales-Quenza & Vizccaíno-Gutierrez, 2007).

Stereotypes: Specific attributes given to a group or a phenomenon. They are characterized by their rigidity inside of the social group´s cognitive system.

CHAPTER 2 METHODOLOGY

To achieve the research objectives, a qualitative methodology was applied "Qualitative studies aim to provide illumination and understanding of complex psychosocial issues and are most useful for answering humanistic ´why?´ and ´how?´ questions". (Marshall N., 1996) The methodological techniques will be presented in regard with the objectives of the research:

2.1 Reviewing of Secondary Information

The identification of the stakeholders was made by the **review of secondary information** related to the Angosturas mining project and the general mining situation in PS and Bucaramanga, issued from December 2009 until March 2013. Likewise, a short stay in the city of Bucaramanga and in the municipality of California in July 2012, allowed the researcher to meet some actors, who provided additional information and the contact details of other related people.

Thus, all the stakeholders were organized by:

- **Scales**: National, State/metropolitan and Municipal/local
- **Type:** Government, private sector, civil society or others
- **Grades** of affectation by mining in PS: Graduation scale from 1 to 3 where directly affected obtained number 1 (their short-term economic, social, political or environmental lives will be affected by mining in PS); moderately affected had number 2 (their medium-term economic, social, political or environmental lives will be affected by mining in PS) and the indirectly affected received number 3 (actors of national/state scale who influence on mining in PS and thereby define mining model in Colombia). This means that they were classified depending on their affectation by large-scale mining.

2.2 Sample selection

Consequently, this study applied a qualitative sample selection called ***Judgment Sample*** (Marshall N., 1996), also known as purpose sample, by which 7 *Key informants* from the studied stakeholders groups were selected and identified from the secondary information review and the

stay in the studied area in July 2012 and the first semester 2013. Subsequently, the study completed the sample selection by the integration of 14 useful potential individuals recommended by the key informants - what is known as ***snowball sample***. (Marshall N., 1996)

2.3 In-depth interviews

I**n-depth interviews** (interrogative technique) (Araya Umaña, 2002) were applied to 21 individuals during March and April 2013. The Interviews tried to lead to the confidence and discursive freedom of the interviewee and were recorded with her/his prior authorization.

Pre-conceptual categories:

The interviews had the following common questions referring to the dimensions of the SR, proposed by Serge Moscovici cited by (Mora, 2002) which were useful to the analysis: *Information/knowledge*, *field of the representation* and *attitude* of the stakeholders towards the mining in PS. Most of the initial and very open questions were modified along the research, depending on the context and the individual process of each interview.

- Type of knowledge:
  - How do you know that?
  - How the declaration of the Natural Regional Park of Santurbán affects the mining activity in the region?
- Field of the representation:
  - What is your occupation/profession/role?
  - What is the issue of mining in PS?
  - What responsibility has the (local/national) authority in the mining situation in PS?
  - How is your relationship with e.g. the authorities/ the community, the opposition groups?
- Attitude:
  - Is large-scale mining in PS something necessary? why?
  - What should be the productive activity to be developed in PS?

Likewise, the following specific questions were asked to the identified groups of stakeholders:

Opinion leaders	Large-mining companies	Traditional miners and community members of California	Environmental and municipal authorities
• How is your position towards mining in PS? • How did you know about this problem? • Why did you decide to be part of this? • What do you think about the declaration of the natural regional park? • What type of mining is better for PS?	• What does the large-scale mining represent for the region? • What is your opinion about the moratorium?	• What is your relationship with mining activity? • Have you seen changes in your life since the large-scale mining arrived? • How is large-scale mining affecting/benefiting you?	• What were the criteria for the delimitation of the natural regional park? • What are and should be your tasks as authority?

2.4 Grounded theory adaptation

After the transcription of the interviews, the method of analysis of the collected information was based on the **Grounded Theory** (Glaser & Strauss, 1967), also known as the Constant Comparison Method. It was applied to each interview and groups of interviews to **describe** the *contents* of the SRs and to **explain** the *internal structure* of the SRs; of the social phenomenon. The systematization of the information was made using the qualitative software of *Atlas Ti*.

- ***Open coding***: This was composed of two moments. The first one was the treatment of the raw information and its constant comparison; assigning a **common code** to the fragments and phrases of the interview that shared one idea (taking into account that at that moment everything was provisional). The second moment referred to the integration of data into **initial categories** that started to be repetitive in the discourses of the other members of the group of stakeholders. Both moments were complemented by theoretical, analytical and interpretative notes. Thus, the core of each SR and the peripheral elements were determined by the **frequency of occurrence** into the discourses of all stakeholders.

- ***Axial coding***: It was the intense analysis of the category´s properties (background, situations in which they differ, the interactions of the actors, strategies of the actors and their consequences). The axial coding allowed uncovering the **relations between the categories**.

- **Schemes:** drawing of the graphic schemes to facilitate the description and the explication of the elements that are related around the studied phenomenon. The schemes visualize the components organized and hierarchized around the central core of a social representation. It is important to mention that the core of each SR was built from the most recurring and repetitive codes: the frequency of the code in the different members of a group.

2.5 Dimensions of the representations

The systematization of the information as well as the analysis and interpretation process; were done in light of the Social Representations Theory and the Social Construction of Reality exposed in the final part of the conceptual framework chapter. The resulting social representations were, thereby, analyzed according to the mentioned dimensions of the SRT: the information/knowledge, the field of the representation and the attitude.

From the foregoing, the expected results are linked with the objectives. The first one of them is a map of the stakeholders from the national to the regional and local scale; the second one is the description and explanation of each one of the SRs and finally the discussion of the SR of mining in PS through the identification of the cognitive similarities and the differences that generate the existence of conflict between the stakeholders. As it can be seen in the Figure 1:

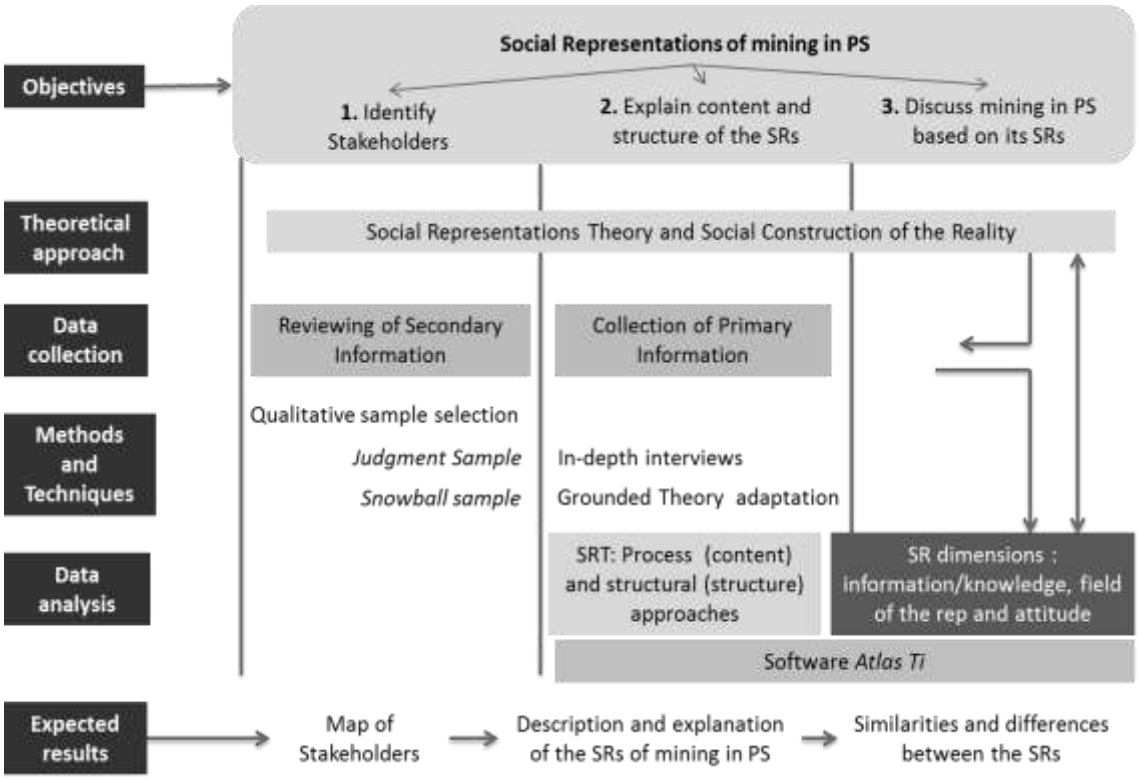


Figure 1 Methodological framework of the study

CHAPTER 3 BACKGROUND

Colombia is the country with the largest bio-diversity per square kilometer of the world (Garay Salamanca, 2013). It is a mega diverse country, which possesses circa 10% of the fauna and flora species of the planet. It is the first country in birds' diversity and the second one in plants´ diversity; as well as the third and fourth in reptiles and mammals respectively (IAVH, 2013). Nonetheless, Colombian biological richness has been going through a period of change; its protection and conservations are being threatened by national policies, which in turn, are motivated by the international market forces.

The increasing promotion of the mining industry in Colombia has been driven by former and current governments and presented as one of the main economy boosters with foreign investment taking shape with gold as the mineral with more mining titles and Antioquia as the state with more granted mining concessions in the country.

3.1 The Mining Situation in Colombia

Colombia has a total area of 114 million of hectares, from which 5.6 million ha divided into 9.439 mining titles, have been granted to mining; 2.312 are gold titles. Around 16% of the mining titles are located in the State of Antioquia, followed by 15% in Boyacá, 11% in Cundinamarca, 8% in Norte de Santander and 6% in the State of Santander (Marín & Londoño, 2013)

In addition, 3.760 out of 9.439 mining titles are in the exploitation phase covering 2.1 million ha. It is estimated that approx. 19.000 mining applications are in the process of being granted; these operations would cover an area of approx. 22.3 million ha. (Garay Salamanca, 2013).

Further, 37 mining titles in 36.155 ha are also in the areas of National Parks and the Páramos of Roncesvalles, Suratá and Jurisdicciones Santurbán (Marín & Londoño, 2013) as the Figure 2 shows.

Figure 2 Mining titles in HME and Natural Parks in Colombia

Important reserves of coal, nickel, gold, platinum, emeralds, limestone and salt, among others are distributed in more than 250 municipalities of Colombia. The country is the first Latin America producer of coal and its reserves are estimated around 17 thousand millions of tones. In 2004 coal production reached 53.7 Mt[6] while the expected coal production for 2019 is of 116 Mt (Ministerio de Minas y Energía, 2009).

Gold, in turn, has an approximated production capacity of 40 t to 46 t per year. Its highest levels of extraction are motivated by the international prices. (Ibid) In the last years the prices of gold have reached historical maximums. The price per ounce of gold rose from 700 US dollars in 2008 to 1.800 US dollars in 2011 (PBI - Peace Brigades, 2011).

[6] Mt: Million tonnes

Likewise, since 1982 ferronickel from the Cerro Matoso operation (State of Córdoba, Colombia), has been extracted, making it the world's main source of this metal. Its production reached to 48 kt in 2003. Apparently, 50% of the emeralds from the total world market come from Colombia and almost 98% of the exported production goes to the United States of America (Ibid).

According to the Mines and Energy Ministry, the Table 1 illustrates the production of minerals from 2004 to 2010 in Colombia:

Table 1 Production of minerals in Colombia

Mineral	Unit	2005	2006	2007	2008	2009	2010
Precious minerals							
Gold	Kg	37739	35786	15683	15482	34321	47838
Silver	Kg	8542	7142	8399	9765	9162	10827
Combustible minerals							
Coal	Kg	53888	59675	66192	69902	73502	72807

Source: Modified table from (Ministerio de Minas y Energía, 2010)

Just as ferronickel, coal has dramatically increased its production, while gold is going up again after two years of low production. Further, the production of emeralds was decreasing year after year at least until 2010.

The Figure 2 and the Table 1 illustrate the huge scale of Colombia´s geological richness and therefore the importance of a conscious and organized extraction and its efficient management by the Colombian government and by the entire society.

The following paragraphs clarify how the Colombian Government conceives of the mineral resources and how it regulates their extraction.

3.1.1 Exploitation rights of mineral resources

Colombian legislation understands the mineral resources as natural crystalline substances, generally inorganic and with physical and chemical characteristics formed by geological processes. Minerals can be metallic (e.g. gold, silver, nickel, copper, lead, zinc, magnesium, aluminum, etc.); industrial minerals (potassium, sulphur, quartz, salt, etc.); aimed at constructioning (sand, clay, limestone, granite, marble, etc.); gems (diamonds, rubies, sapphires and emeralds); and

combustibles (coal)[7]. In any case, according to the Ministry, minerals are basic to the production of materials used by the modern society and are necessary for everyday life (Ministerio de Minas y Energía, 2009).

Articles 332 of the 1991 Political Constitution and 5 of the Code of Mines of Colombia (2001) sustain that **the ownership of the mineral resources is exclusively of the Colombian state**, regardless of their natural physical condition, their location or their ownerships of mining land, which can be public, private or collective. This governmental property is inalienable and imprescriptible, based on the premise that the mineral resources are non-renewable.

The possibility of starting the exploration phase of a specific mining project and the posteriorly construction and exploitation phases is allowed only by requesting to INGEOMINAS for concession contracts or mining titles (regulated by Law 685 of 2001 "Code of Mines"). This could last one or two years (CRQ , 2010). The requirements are simple and can be submitted on internet: copy of identity card, certification of legal representation, topographic map delimiting the area, certificate of the uploaded proposal on the official web site and payment of one current monthly legal minimum wage (around 250 US$). Once issued the validity of this title is for 30 years, which may be extended for the same period (Vélez, 2011).

In order to obtain the Environmental License the EIA must be submitted to the authorities in charge: the respective Regional Autonomous Corporation – CAR or the Ministry of Environment. The responsible authority depends on the magnitude of the expected extraction. However, in some cases the EIA requires the prior consultation with indigenous and Afro-Colombian communities in coordination with the Ministry of Interior and the responsible unit.

3.1.2 Profitability performance of mining

The mentioned normative agility is correlated with the high profits derived from the mineral extraction, as it can be seen on the following charts (Figures 3 and 4):

1 US dollar equals about 1800 Colombian Pesos (COP) (constant COP 2005).

[7] Oil and gas are not included into the category of minerals.

Figure 3 Development of mining GDP 2000-2011

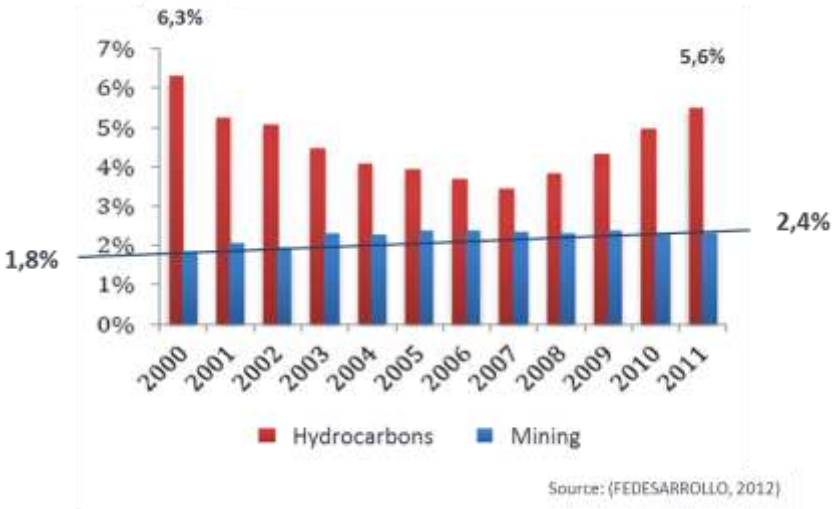


Figure 4 Participation of the mining and hydrocarbons sector in the GDP of Colombia 2000-2011

According to the socioeconomic report of mining in Colombia made by FEDESARROLLO (2012), the economic contribution of this activity to the Colombian GDP has increased from 5.2 thousand millions COP in 2000 to 10.3 thousand millions COP in 2011, which in turn corresponds to an increasing participation of mining sector, from 1.8% in 2000 to 2.4% in 2011.

The most clear economic contribution from the mining sector in Colombia is through the royalties (Law 141 of 1994). "[They] are economic compensations that the State receives due to the exploitation of a natural non-renewable resource whose production decreases over time" (Dirección de Regalías, 2007) (Own translation). The Table 2 shows the mentioned profits:

Table 2 Royalties on mining and hydrocarbons, Colombia, 2004-2011

Product	Royalties 2004		Royalties 2011	
	$	%	$	%
Hydrocarbons	**2585**	**90,1**	**8190**	**83,6**
Mines	**285**	**9,9**	**1611**	**16,4**
Coal	167	5,8	1269	12,9
Nickel	76	2,6	175	1,8
Gold	34	1,2	158	1,6
Others	8	0,3	10	0,1
Total	**2870**	**100**	**9801**	**100**

Source: (Dirección de Regalías, 2007)

Between 2004 and 2011 the royalties from mines around the country almost doubled (from 9.9% to 16.4%). It can be seen particularly an increment in the royalties from coal (from 5.8% to 12.9%).

According to the 2001 Code of Mines, the payment of royalties and the payment of regional taxes are mutually exclusionary obligations. It means that mining companies do not have to pay any taxes to the territorial administration where their operations take place; not even the industry and commerce tax. It also means that the municipalities must be liable for the negative environmental and social consequences of mining, but without advantages in fiscal terms (Garay Salamanca, 2013).

Yet, **the big fiscal contribution of the mining royalties is a fallacy**. At least that is what the recent report of the General Controllership of the Republic about mining in Colombia affirms, since for

every 100 COP of royalties[8], the State has given discounts up to 132 COP of income taxes. (Garay Salamanca, 2013) Thus, Colombian State pays for being exploited.

In brief, the owner of the minerals and non-renewable resources is the Colombian State. The extraction and production of minerals seem to be an important amount of the GDP in some official economic documents, but the figures are contradictory. The tributary benefits are a lie; the State returns the mining companies more money that it had received. Meanwhile, the production of minerals increases and there is a need to question in particular whether the sustainability, the equity and the quality of life have been increased at the same level of, for instance, the economic profits and the number of concession contracts.

3.2 Impacts of Gold Mining Industry

3.2.1 Mining policy

Authors like Ernesto Guhl Nannetti (Guhl Nannetti, 2011) cited by (CINEP , 2012) argue that the "mining boom" in Colombia is part of a transnational strategy, which plans to take advantage of the high international demand/prices of minerals, through their exploitation in the developing countries to feed the industry sector of the central and emergent countries. So, minerals are extracted and sent there as raw materials without added value; contributing to the perpetuation of primary processes of mining countries against their possibilities of industrialization, which is the usual colonial practice used for centuries.

In any case, this commercial practice was officially ratified in 1974[9] with the *joint-ventures* (Decree law 2310), where the country increased the exploitation of its natural resources and pledged to maintain trade and investment flows. The necessity of making the extraction compatible with the nature´s renovation cycles led to the construction of a new and more integral national normative in the 1991 Political Constitution of Colombia. The materialization of these purposes was the Environmental National System (SINA) (Law 99 of 1993) as a complete set of orientations, norms,

[8] This refers to mining royalties, not to the hydrocarbons' royalties. Although the discount figures for this concept are also alarming.

[9] The first environmental regulation document produced by Colombian government: **National Code of Natural Resources** (Decree 2811) was published also in 1974.

activities, resources, programs and institutions ready to manage and coordinate environmental issues at national, regional and local levels (CINEP , 2012).

The SINA has suffered substantial modifications made by government initiatives since 2001; there are even information about financial and technical **collaboration of Canada in the elaboration of the regulatory official mining documents** in 1997 (Fierro Morales, 2012), which could explain the huge current participation of this country in the Colombian mining sector. Colombian presidents Andrés Pastrana and Alvaro Uribe[10] aimed to bring to the mining industry the "good business climate" (Hurtado Sabogal, 2011) changed the role of the State; now, it is not easy to see any motivation for public investment in mineral extraction; this task has increasingly been performed by transnational companies (CINEP , 2012).

The Code of Mines is one of the most amended normative tools. The first version was issued as the Decree 2655 of 1988 making clear that the Nation was the owner of all non-renewable natural resources from soil, regulating activities as prospection, exploration, exploitation and benefit, establishing different types of mining titles and affirming that the **State** was going to be the **entrepreneur** through the contribution system (Fierro Morales, 2012).

Nothing stopped the amendment of this Law and in 2001 the new Code of Mines (Law 685 of 2001) was passed. It meant a shift in the mining policies, where the State was aimed to **promote and supervise** the mining activities, but not to generate mining enterprises of public or mixed-capital. (Ibid) Some characteristics of this Code are:

1. The Code of Mines of 2001 established the ***royalties*** as a monetary compensation for the cost of the mineral resources. These taxes must be paid to the Colombian State by the private mining companies.
2. The Code simplifies and relaxes the rules in order to facilitate the private investment. As it has been presented in the section of this document about the *exploitation rights of mineral resources*.

[10] However, the necessity of increasing foreign investment in mining was clearly expressed by the two previous presidents: César Gavíria and Ernesto Samper P. though without any substantial actions.

3. It determines the principle of "the first one who requests the mining title", which refers to the obligation of granting the mining title to the person who requests it first.

President Santos clearly took over the tasks and based on this flexible mining legislation has led the National Development Plan "Prosperidad para Todos (2010-2014)", where the mining energetic sector represents one of his "growth locomotives" of progress among other 4: Agricultural sector, housing sector, transport Infrastructure sector and the innovation sector. (Santos, 2010-2014)

It is worth to mention that the described legal, administrative and economic panorama has been developed in the middle of a country with high levels of corruption[11], with lack of professionals and experts in mining and suffering from the ravages of the almost 60 years old internal armed conflict.

That is how the mining "boom" has taken shape in Colombia, often to the detriment of human rights and of the living conditions of the rural, indigenous and Afro-Colombian communities; aspect which will be further discussed below. Prior to that, the artisanal gold mining in Colombia will be exposed in order to clarify the context.

3.2.2 Types of (gold) mining

First of all, it is necessary to distinguish briefly Colombian mining under the Legal Order: [12]

Table 3 Types of gold mining in Colombia

Occasional mining: It refers to occasional or transitory open pit extraction of industrial minerals. The activity is made by landowners and it has to be in small quantities, shallow and by manual means. (Procuraduría General de la Nación, 2011)
Subsistence mining: It is developed by non-technical method of extraction and represents a very low income (Ibid).
Barequeo (gold panning): popular activity of the inhabitants of alluvial areas, where the sand is

[11] According to press articles, corruption scandals took place even in INGEOMINAS, where occurred a number of irregularities such as substitution of offices, selling of confidential information in the cafeteria of the institution and a "witch hunt" against the people who were not involved. (Revista Semana, 2011)
[12] This classification of mining is part of the constructed reality by the legal institution and may be not shared by the other social groups; as much as in the names as in their meanings.

washed and divided from the precious metals using manual methods. (Ministerio de Minas y Energía, 2012) Practitioners must be registered at the municipality and have authorization of the landowner, where the barequeo takes place.

Ancestral/traditional mining: It is mining which is practiced by individuals, groups or communities who exploit mines of the State without having mining title. Besides, they should comply two requirements: the mining works must have been developed for 5 consecutive years and the miners must have been working minimum since 10 years before the entry of the law 1382 of 2010, the Mining Code Reform (Ibid).

Artisanal mining: activities developed by small miners who are self- employees. They work as individuals, as families or associates (cooperatives, small and micro enterprises). In some cases artisanal mining is developed by Afro-Colombian or indigenous communities (Procuraduría General de la Nación, 2011).
The ancestral, traditional and artisanal mining are very much interlinked, not even the official documents make a clear distinction between them and are being dangerously equated with illegal mining.

Illegal mining: It refers to exploration or exploitation of minerals belonging to private or national property without the valid title or without the authorization of the landowner. (Ministerio de Minas y Energía, 2012) Besides, illegal miners don't pay any taxes or royalties.

Formal mining: It is composed by exploitation units of different sizes, where mining enterprises legally established operate.

Informal mining: small and medium units of individual property and with no accounting records.

Legal mining: It is protected by a mining title registered at the National Mining Registry. (Ibid)

Accordingly, other sources differentiate the types of mining depending on the technological level, the working capital and the security standards:

Since 2001, the new Code of Mines established that any mining exploitation, no matter how small it is; to get the authorization to operate, it has to meet the same requirements of the international companies. This, together with the mentioned considerations, has generated a considerable increase of large-scale mining and has contributed to make less profitable the traditional and artisanal mining. Besides, the latter are at disadvantage compared to large-scale enterprises; and very often at risk of being indicted as illegal activities, in the current mining policy (CINEP , 2012).

Source: (PBI - Peace Brigades, 2011)

Artisanal miner from Chocó, Colombia

Figure 5 Barequeo (gold panning), traditional and artisanal mining

Needless to say that the large-scale mining enterprises not only benefit from Colombian minerals, but also of the flexible and unclear mining legal framework of Colombia; This is why, social and environmental violations are still occurring along the country, without compensation or even an appropriate punishment, as can be seen in the following paragraphs.

3.2.3 Environmental impacts of gold mining

It is undeniable fact that mining operations generate a large number of consequences on the environment and the social conditions of the local people. This productive activity is "(…) accused of stripping terrain, creating unemployed populations upon departure, and exiting communities in the wake of increased pollution to community water, air or land resources" (Brown & Flynn, 2008). To illustrate the environmental impacts, a recent report about mining in Colombia made by the General Comptroller of the Republic, presents them according to their material footprint, the hydric footprint, the water quality and the chemical pollution due to blasting. Likewise, the following information includes three large-scale open pit gold mining projects in the country: Marmato of the enterprise Gran Colombia Gold, Angosturas of Greystar Resources (the

environmental license was denied to this operation) and La Colosa of Anglogold Ashanti (Garay Salamanca, 2013).

Material footprint

According to the data provided by Garay (2013), the three projects would produce circa 4300 Mt of rocky rubble and tailings during a period of less than 30 years. It means 50 to 140 Mt per year. Added to this is the release of chemicals, such as arsenic from the aresenopyrite, which is a characteristic of the gold mines. The figures are alarming when they are compared with the household waste produced by Bogotá, the capital and biggest city, which is around 2 Mt a year, similar to Buenos Aires or Rio de Janeiro. Thus, gold open pit mining wastes are 25 to 70 times bigger than the average household waste of Latin-American cities.

Besides, the mining projects located on the Andes have porphyry as main type of deposit with high concentration of sulphides, which cause acid reactions when exposed to the air of the waste tips.

Hydric footprint

A large-scale gold project requires 31.5 million m3 of water per year to process one ton of mineral. That is to say, to process one ton, it is necessary to use **1 m^3 of water per second**.

Similarly, if the deposit is of 0.86 grams of gold per mineralized rock; to get **one gram of gold,** we need **1160 L of water**. Now, if 60% of the water is re-circulated, proposed by many projects, the hydric footprint per gram of gold would be of 464L, which is also a high quantity.

The comparison of the hydric footprint of mining processes with the quantity of water used to the production of staple food products obligates to question on the main uses of gold; taking into account that most of this mineral become luxury good or value support, since gold is considered as quasi-equivalent to pattern currency. The discussion is more than relevant when the risk of low water availability due to the climate change scenarios is threatening this South American country. Especially the reduction of HME areas as a consequence of the temperature increase and the

decrease of pluvial precipitation in areas where human consumption is high: the Andes zone and the Caribbean coast. (Garay Salamanca, 2013)

Water Quality

There are two ways of polluting the water. The first one is produced by the high quantities of sulphides that are in the rocky rubble, since they generate acidity when are exposed to air; the second one is caused by the addition of chemical elements, such as cyanide, that produce alkaline residues. Both phenomena (extreme acidity and alkalinity) allow the dissolution of toxic chemical substances in the water streams. This has led to the pollution not only of underground water but also of the soil (Garay Salamanca, 2013).

For instance, the Environmental Impact Study (**EIA**) of mining gold in the Páramo de Santurbán submitted by Greystar Resources affirms that the cyanide leaching of mineralized rock causes the release of heavy metals (silver, arsenic, cadmium, chromium, mercury, lead, sulfur, uranium, zinc and sulfate) in greater quantities than the gold.

Thus, a mineralized rock has 40 times more arsenic, 10 times more chromium, 170 times more lead, 5 times more uranium y circa 50 times more zinc; elements that are potentially released to the environment through the weathering processes or through the chemical processes of leaching. This fact is highly relevant if we take into account that these mineralized rocks are located upstream of the drinking water intakes of Bucaramanga city and casts doubt on the mining activity inside the supply basins.

Chemical pollution due to blasting

The same EIA of mining gold in the PS holds that in order to produce 7.7 million ounces of gold in 15 years with a removal of circa 110 Mt of rock, an estimated quantity of 14.5 Mt of Ammonium nitrate fuel oil (ANFO) are needed; that is 398.000 ton per year.

Therefore, to get one gram of gold 910 kg of ANFO would be required; this being a potential chemical pollution due to blasting.

To sum up, the contaminating footprints related to gold mining can be seen in the table below:

Table 4 Estimated contaminating footprints related to the Angostura gold mining project, Colombia

Contaminating footprints	Per gram of gold
Chemical contaminants released by rocks (sulphides)*	7700 g
Chemical contaminants released by rocks (arsenic)*	30 g
Chemical contaminants released by rocks (lead)*	377 g
Chemical contaminants released by rocks (ANFO)	910 g
Use of water	500 – 1000 Lt
Rocky rubble and tailings	3 – 4 Ton

*These quantities correspond to the released contaminants only through leaching process. They don't include the release of chemicals in the dump areas. The data are based on the Angosturas mining project in PS.

Source: (Garay Salamanca, 2013)

It is worth to mention that the above data were based on large-scale mining projects, but it should not be overlooked the fact that the small-scale mining has contributed to make of Colombia the sadly **world´s most contaminated country with mercury**. (PBI - Peace Brigades, 2011) This might be because of the widespread idea that the only way to obtain gold is through amalgamation process with the subsequent disproportionate use of mercury. For further information about water contamination with mercury and cyanide in Colombia and its health impacts, one can check the case of Segovia municipality in Antioquia (concentration of mercury is 1000 times higher than the permitted) and La Mojana region. (Güiza Suárez, 2011)

The mentioned considerations of environmental pollution have also other number of consequences, for example on the public health and the food sovereignty particularly on the peasant and ethnic communities, who earn precarious income and depend on their own crops.

3.2.4 Social impacts of gold mining

On the basis of the above and taking into account that the socio environmental problems in Colombia are not a new issue; it attracts the attention the increase of the social unrest associated

with mining projects of coal, gold and hydrocarbons (civil strikes, marches, sit-ins, road blockades, hunger strikes and community riots):

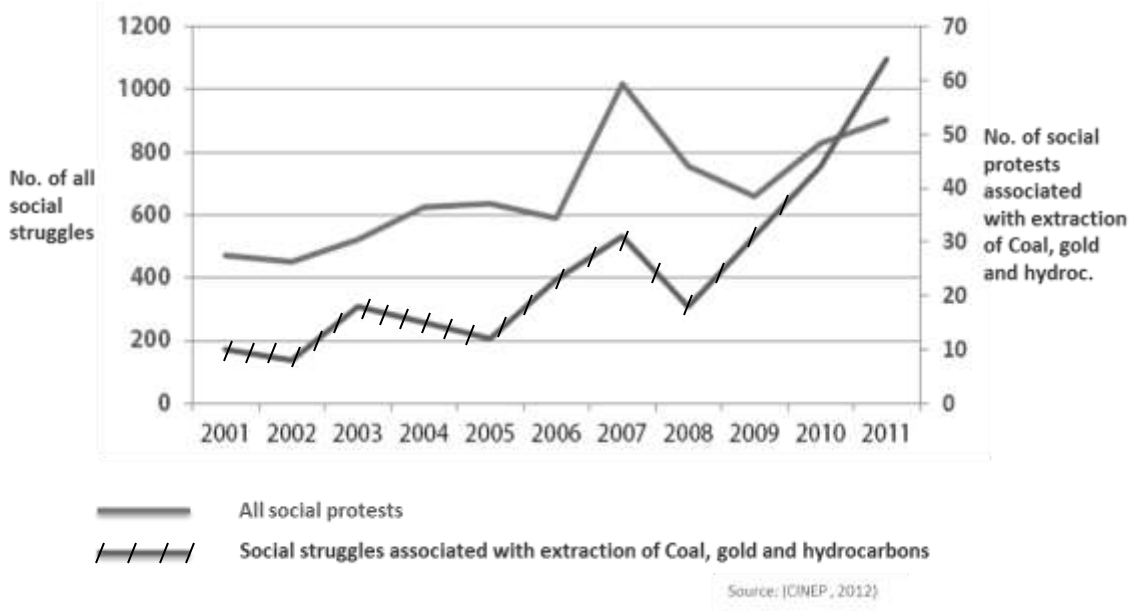


Figure 6 Social protests associated with extraction of coal, gold and hydrocarbons in Colombia. 2001-2011

During 2001 and 2011, 274 collective social actions were registered; 3.7% of the total of social struggles (Figure 6). Since 2008 took place a sustained growth. Within these actions, 19% were associated to gold mining, 57% to hydrocarbons, 18% to coal and 6% to mining in general. The main reasons of the social actions related to gold mining were (CINEP , 2012):

- Labor disputes:
  - Employees denounced violations of labor legislation in health, social security, industrial security and massive lay-offs while gold production was simultaneously increasing.
  - Artisanal miners claimed their right to work after they were displaced from their mines by the local administrations, which were following the willing of the mining companies. All this accompanied by the subsequent poverty, scarcity and very high costs of the mining explosives.

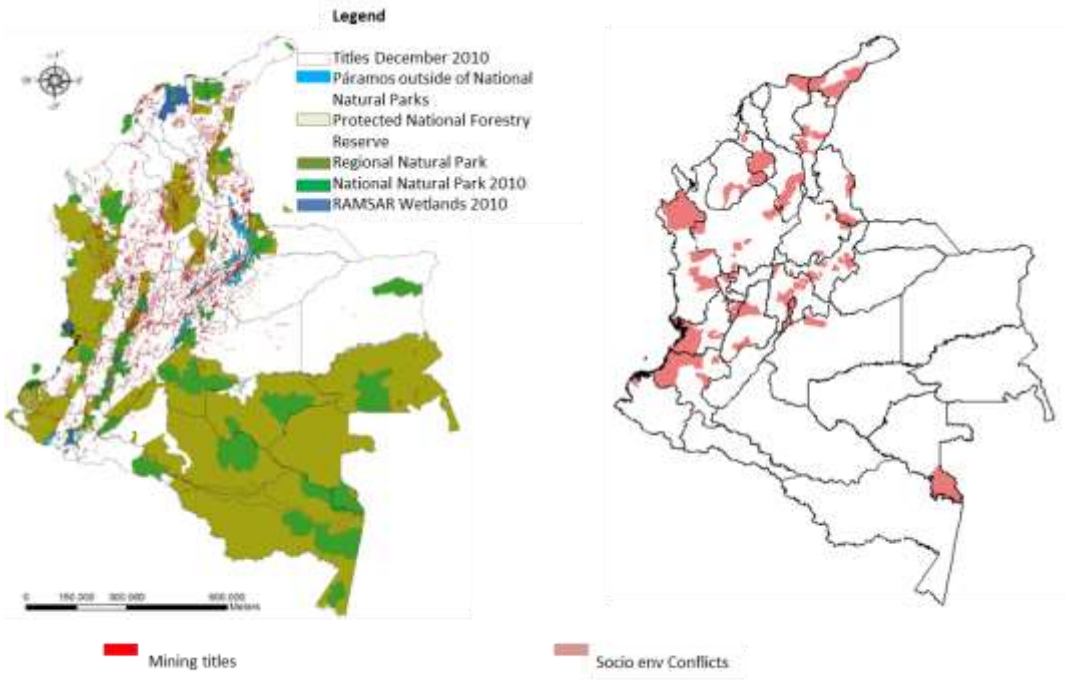
- The defense of right to life, integrity and freedom in regard to a return of the demobilized paramilitaries in Sogovia y Remedios region.

- The defense of the territory, community life, traditional production, cultural rights and autonomy; which are threatened by the presence of multinational enterprises; that did not make the prior mandatory consultation and did not accept the will of the local communities. For further information on disputes of peasants and Gran Colombia Gold, Embera indigenous and Muriel Mining Co. see (CINEP , 2012)

- The defense of the right to a healthy environment, of the water and against of gold exploitation in the mine La Colosa (Cajamarca, Tolima) by Anglogold Ashanti. This mining activity takes place in a very important watershed which provides water to 10 municipalities. The same situation occurs in El Nevado del Ruiz (Manizales, Caldas) by CoreValuesMining&Exploration Company in the mine Tolda Fría de Villamaría; that is located in a páramo at 3.000 Mt above the sea level. To these claims, add the case study of this thesis: the mining activity in PS (California, Santander) by the Canadian subsidiary Greystar, among other enterprises.

- The environmental deterioration and the insecurity in the mines in the riverbanks of the Cauca River (Suárez, Cauca), where a huge quantity of artisanal mines were closed due to the extreme proximity to the town center and the Salvajina dam, which provides water to Cali and Yumbo. This happened also in Nechí (Antioquia) with 47 miners, who were working in illegal mines. They have been claiming some areas to work in a legal way.

An illustration of the social conflicts and their relationship with mining activity can be seen in the Figure 7, where is also possible to see that most of the mining projects and the social conflicts are on the Colombian Andes Mountains:



Source: (Fierro Morales, 2012)

Figure 7 Mining titles and map of socio-environmental conflicts, Colombia. December 2010

Studies like that by Jorge Iván González (González, 2011) cited by the CINEP (2012), contend that despite the mining´s surplus, there is no improvement in the living conditions of the local people.

Similarly, an element that complicates socio-environmental conflicts is the low citizen participation, due to the little importance that many environmental experts and environmental administrations give to the social studies in mining projects; particularly when the EIA is submitted to obtain the exploitation permits. According to Garay (2013) it is possible to say that in Colombia the communities' participation in mining projects is limited only to the information level, which is the lowest one, wide under the consultation, initiative, inspection, conciliation, decision and administration levels (Garay Salamanca, 2013). This means that, the mining companies inform the local population about the projects and sometimes they try to include community´s feedback into the EIA. Unfortunately, at the end those social aspects are not taken into account.

Finally, it cannot be forgotten some widely known social impacts of mining such as drug addiction and prostitution.

CHAPTER 4 CASE STUDY

To start with the definition of the study area is necessary to make a brief reference to the exceptional features of the HME or *páramos*, followed by the description of the Páramo de Santurbán and their current situation related to mining.

4.1 Páramos or High Mountain Ecosystems (HME)

The *páramos* are unique ecosystems; terrestrial archipelagos (in a sea of forests) that exist only in five countries in the world and are all located in the American continent: Venezuela, Ecuador, Peru, Costa Rica and Colombia. Even those in Costa Rica and the Sierra Nevada de Santa Marta, Colombia are on the tops of the northern Andes (IAVH , 2007). Generally HME are between 3100 and 4000 m above the sea level and bordering the Ecuador Line, which is why they receive sunlight the whole year in irreplaceable quantity and quality.

Likewise, the latter characteristic enables them to develop their endemic vegetation, which makes them strategic ecosystems. This is because of the hydric regulation they provide as a result of their low temperatures[13], which reduce the evaporation and retain water through their flora (Güiza Suárez, 2011).

Some of the environmental services offered by the *páramo*s are: Endemic biodiversity, enormous ability to fix atmospheric carbon, and efficiency in the processes of storage and water regulation, in order to provide the primary resource for constitution of life, water (IAVH , 2007). It is not uncommon to recognize these ecosystems as "water factories" due to the fact that most of the rivers and streams of the country spring here.

Despite the difficulty in differentiating and delimiting the vegetation zones of a Páramo, since they depend on the particular conditions of each one of the three Cordilleras and on the

[13] Low temperatures lead to a very slow growth of the micro bacterial activity, the organic matter and therefore of the vegetation.

"*paramización*" phenomenon[14], we find the Sub-páramo or the lower páramo (approximately between 3.300 and 3.800 m in the Eastern Cordillera. It is lower in the other Cordilleras), the Medium Páramo, the Upper Páramo and the Nival zone.

Colombia has 34 páramos (1.7% of the national territory) and one of their major threats is the cropping, since year after year is taking more territory. Another important issue affecting páramos is related to the mining activities recently developed in their mountains, despite the legal conditions the government set out in the 1991 National Constitution, through which the conservation of these ecological important ecosystems is promoted. However, their protection faces a huge obstacle, since it has not been possible to delimit them in a properly and exact way because the lack of accurate, climatic and geographic criteria. Another official document which supports the necessity of a clear delimitation of the HME is the Code of Mines (CD). Further, it establishes the geographic delimitation based on technical, social and environmental studies in order to prohibit mining exploration and exploitation.

Therefore, there is a clear incompatibility in the Colombian legal system between the mining activity and the páramos. 108.972 ha, not having into account the areas outside the national parks, 391 ha are granted to mining titles (Güiza Suárez, 2011). Some documents speak about 130.000 ha of páramos with exploration concessions in year 2010 (PBI - Peace Brigades, 2011). More recent studies sustain the existence of 37 mining titles in Natural National Parks including 3 páramos: Roncesvalles, Suratá and Jurisdicciones-Santurbán (Marín & Londoño, 2013).

4.2 Páramo de Santurbán

4.2.1 Páramo de Santurbán Complex

The PS, denominated *Jurisdictions-Santurbán Complex*, is part of the Bucaramanga-Santa Marta geological fault in the core of the Eastern Cordillera of the Colombian Andean mountain system in the states of Santander and Norte de Santander (Figure 8). It occupies 82,664 ha between 3,000 and 4,290 meters and has wetlands of periglacial origins between 3,500 and 3,800 m as well as 457 identified plant species, 17 species of amphibians and 42 bird species, at least 24 different

[14] This refers to the destruction of the upper forest bordering the páramos by actions of the human beings and the extent of the vegetation with páramo species, replacing the native forest. (IAVH , 2007)

natural ecosystems (including Andean and High Andean biomes) and 57 lakes from which 22 are located in the state of Santander and 35 in Norte de Santander (IAVH , 2007).

35% of the total area of the PS has been intervened with crops and grazing fields; particularly in the municipalities of Tona (the urban area of this municipality is inside the limits of the complex), Mutiscua, Cácota and Silos. 53.800 ha (65%) from its 82,664 ha are natural ecosystems, from which the most significant is the *wet páramo in glacial mountain* (20% of the complex).

The climate of the PS may be cataloged as "cold of High Mountain" and slightly wet and very wet, classification EB according to W. Köppen. It has a bimodal precipitation, where the high periods are between the months of April and May, and September and November; having a multi-annual precipitation varying from 600 to 2.500 mm. The average temperature is 9 Celsius degree. The highest temperatures are in May and July, while the lowest are between October and November.

The geological composition of the PS is described based on the type of the material: Precambrian metamorphic rocks; sedimentary rocks from the Devonian, sedimentary rocks from the Carboniferous and Permian, igneous and sedimentary rocks from the Triassic-Jurassic, cretaceous rocks and quaternary deposits. Likewise, predominant flecks of gold and silver are located in the mining district of California-Vetas. They are related to the iron sulphides, lead, zinc, cooper and the not oxidized mineral of sulfur. The most common geomorphology is composed by two big landscapes: the Glacial-fluvial peaks over 3.500 m and the Fluvio-gravitational peaks. The soils are very superficial, limited by rock, moderately deep and of loamy to clay-loam texture. Besides, they are well drained, of acid reaction (pH 4.5 to 5.0) and low natural fertility. (IAVH , 2007)

The PS supplies water to an estimated population of 1.7 million people, distributed in 21 municipalities, including two large capital cities: Bucaramanga and Cucuta. The administrative jurisdiction of the PS is managed by two environmental offices: the Regional Autonomous Corporation of North Santander - CORPONOR (73.92%) and the Autonomous Regional Corporation for the Defense of the Bucaramanga Plateau (**CDMB**) (26.7%). (Ibid)

PS is considered a "fluvial star", since it is part of the hydrographic zones of Caribe, Magdalena-Cauca and Orinoco, the hydrographic zones of rivers Catatumbo, Medio Magdalena and Arauca

and into seven subzones (especially the rivers: Zulia, Lebrija and Chitagá), just as the Table 5 shows (Ibid):

Table 5 Hydrographic zoning of the Jurisdicciones-Santurbán Complex, Colombia

Hydrographic region	Hydrographic Basin	Hydrographic Sub-basin	Area (ha)	%
Caribe	Catatumbo	Pamplonita River	941	1.14
		Zulia River	30.515	36.92
		Sardinata River	6.078	7.35
		Tarra River	1.456	1.76
		Algodonal River	599	0.72
Magdalena-Cauca	Medio Magdalena	Lebrija River	26577	32.15
Orinoco	Arauca	Chítaga River	16.499	19.96

Source: (IAVH , 2007)

According to the last official bio-geographical study made by the CDMB in 2002, 77.000 people are the total population of the complex distributed in the municipalities of: Arboledas, Cucutilla, Mutiscua, Silos and Cáchira (in Norte de Santander); and Tona, Vetas, California, Suratá, Charta and El Playón (in Santander). However, the study points out that the exact quantity of people who live into the limits of the PS is unknown (IAVH , 2007).

The main productive activities are: agriculture, livestock-raising and mining. The main crops being farmed are onion (10 – 37 ton of production. 18 ton per ha average) and wheat (10 ton/ha per year). Farming (bovine and ovine) with a capacity of 2 beef cattle/ha and 8 ewes/ha take place there. The study also relates the gold and silver mining activity in the municipalities of Vetas and California in an approximated area of 50km^2. (Ibid)

Yet, as mentioned earlier, the specific features of the PS facilitate the deposits of gold and silver, among other minerals, which have motivated the mining activities in this area, particularly in the municipalities of California and Vetas, where pre-Hispanic mining activities took place.

4.2.2 Municipality of California, Santander State, Colombia

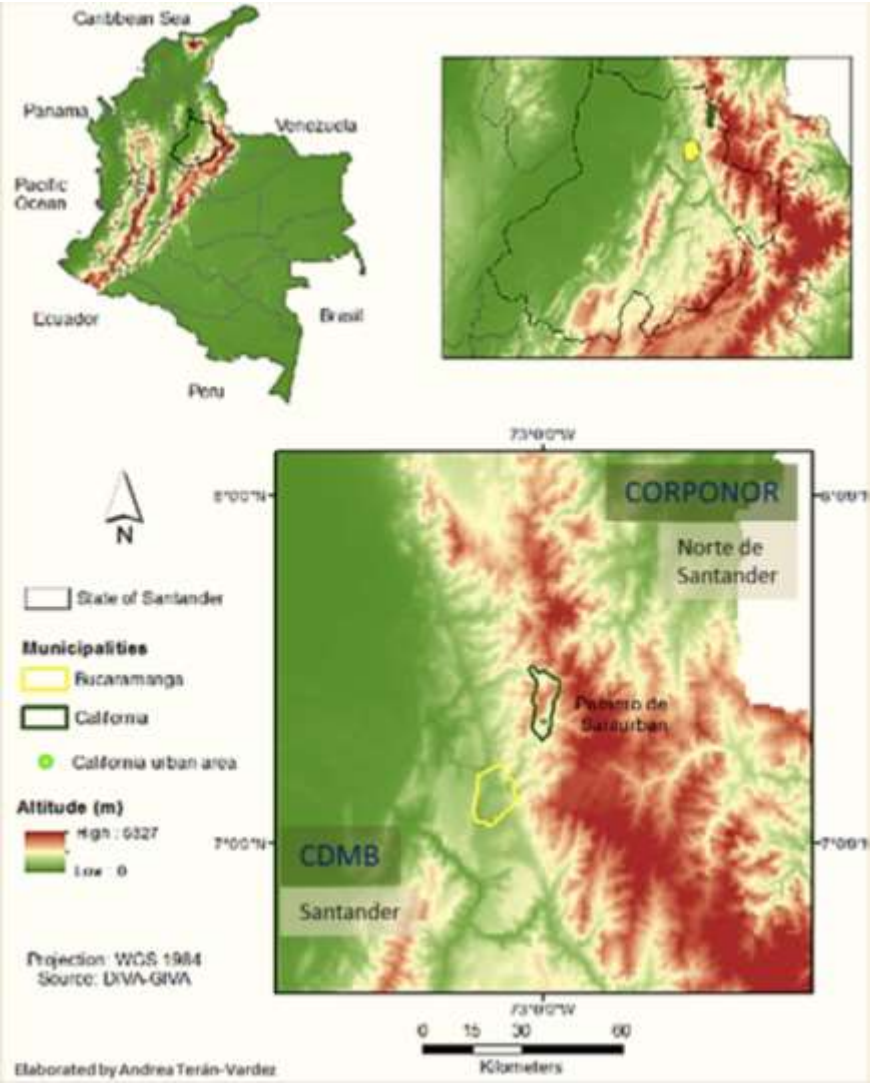


Figure 8 Municipality of California

This municipality is located at 7° 21´ latitude north and 72° 57´ west longitude in the province of Soto, to 51 Km northeast of the city of Bucaramanga. To arrive there is necessary to travel a semi-paved and bad conditioned road that crosses the municipalities of Matanza and Suratá. It has an extension of 5.260 ha (52.60 km^2). It borders to the North by the municipality of Suratá and the State of Norte de Santander, to the East by the municipality of Vetas and to the West and South by the municipality of Suratá. The urban area of California is located at an average height of 2.005 m, without forgetting that some part of the territory rises to 4.000 meters above the sea level. The

average temperature is of 17°C, varying between 13°C and 20°C. The rainy seasons, also bimodal, are from March to May and from October to November and its soils are of sandy loam texture, superficial and good to excessive drainage (Municipio de California , 2012).

The studied area presents a big range of soil varieties. On the highest parts of the municipalities of Vetas, Suratá, Charta and Tona the soil is very superficial and with thick textures; being this, the reason why it has very low fertility.

According to (Mendoza & Jaramillo, 1979), "the Vetas-California mining district is part of the Santander Massif, which consists of a complex of pre-Devonian metamorphic rocks and Mesozoic igneous rocks", further it is possible to find Precambrian metamorphic rocks that build the central gneiss belt of Bucaramanga and form a complex fault around the already mentioned major regional fault: Bucaramanga-Santa Marta.

About its hydrology, California is part of the Lebrija Superior Basin, the Suratá Sub-Basin (**SSB**), and the Vetas Micro-Basin, the latter two with 13.072 inhabitants (IAVH , 2007). Figure 9 shows how the SSB integrates the flow of water from the mining district of California and Vetas to the city of Bucaramanga.

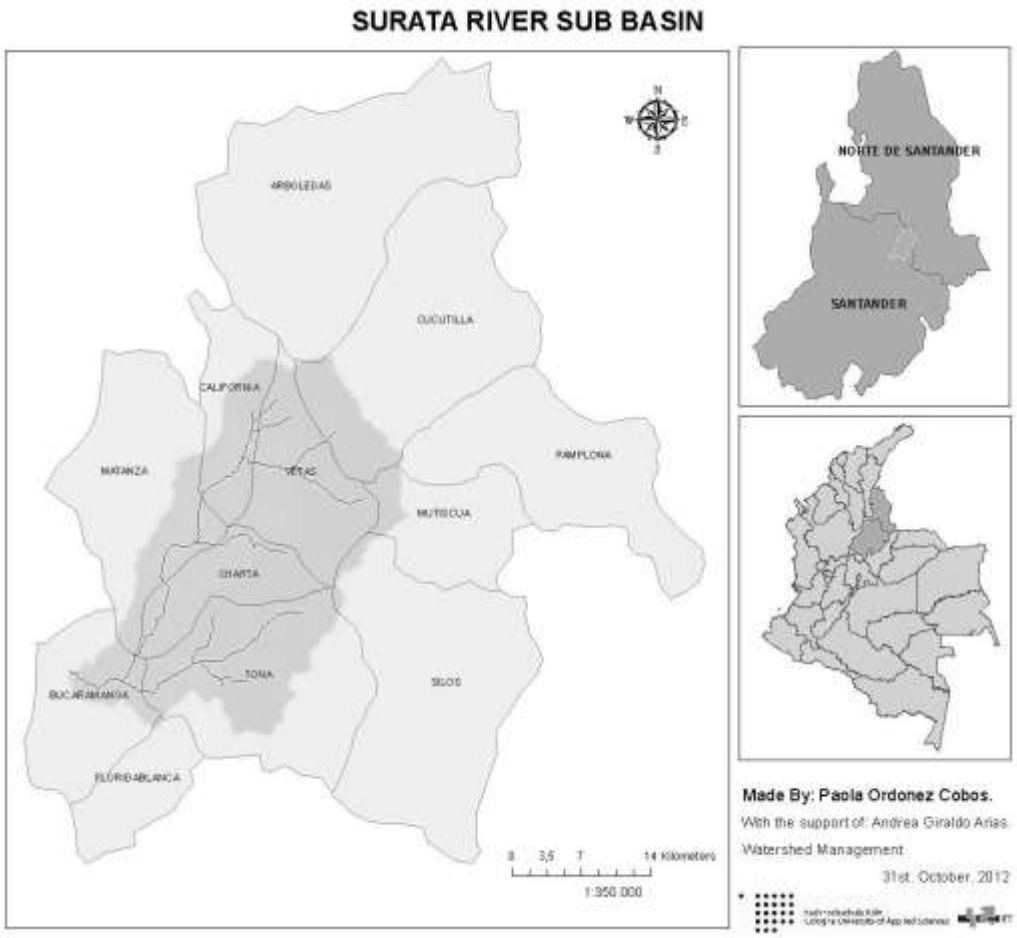


Figure 9 Suratá sub-Basin. Santander, Colombia

The main small river of California is La Baja, which in turn has other small tributaries: Angosturas, Páez, San Juan and Agua Limpia and in the Páramo zone is located the lagoon Páez (Municipio de California , 2012).

The Municipality of California has a politic-administrative division of villages besides the Urban Area of California, where the central administration is located, as well as the Local Court, the Local Registry, medical center, the church, the priest´s house and the central command of the national policy. The villages are: Pantanos, Santa Ursula, Cerrillos, Angosturas, la Baja, Centro and Tabacal.

According to Hurtado (2011), the total population of the Mining District is around 4.200. Hence, California has 1.700 inhabitants and Vetas 1.278 inhabitants. California has a dislocated economy, since **almost the whole municipality depends on mining industry**. 54.3% of the economically

active population is dedicated to mining exploitation (Árias Celis, 2012). This is an old tradition that can be seen in the social referents of the municipality such as the statue of a miner in the main square, the name of the church, the municipal shield, the Hymn, the traditional fest of the Miner´s Day, among other cultural elements.

The land tenure in California is represented by small landholdings, since 60% of the private properties have less than 10 ha, 15.42% have between 10 and 20 ha (familiar work and subsistence economy) and 17.42% are bigger than 20 ha; located in the villages of Santa Úrsula, Angosturas and La Baja (Árias Celis, 2012).

In the same vein, the California Development Plan (2012) mentions the marginality of the Californians as a consequence of the current large-mining situation and their unpreparedness associated with the multiple goods, services and workforce that the industry demands from the local community. They have developed an individualistic, short-term and paternalistic vision because they are considering themselves only as unskilled labor and are being dependents on the big multinationals. Likewise, the in-migration (50% population increase in the last 10 years) is not only affecting the local population and their traditional values and customs, but is also putting pressure on demand of the social services (education, medical services, recreation and alimentary security, housing, among other).

4.3 Mining in Páramo de Santurbán

4.3.1 Mining history of Páramo de Santurbán

After the arrival of the Spanish, who by the way settled this region due to the minerals and the goldsmith of the indigenous, mining was developed constantly; even though not always in the same proportions. This was fluctuating depending, most of the times, on security conditions of the country and therefore of the region.

Thus, the recent history of Mining in PS dates back to early **1995** when INGEOMINAS, not caring about the hydrological importance of the PS, granted a Gold mining title with an extension of 139 km^2 to **Greystar Resources Ltd**, a Canadian subsidiary, which opened the door to other mining companies that arrived years later to California. The **arrival of Greystar in California** was one of

the successes of the national security policies implemented by the ex-president Alvaro Uribe Vélez, who put forward new belligerent ideas about how to recover the territorial sovereignty. The main policies of Uribe (2002 -2010) were: Democratic Security, Investor Confidence and Social Cohesion; which meant the expansion of the military offensive in order to recover the territory, the offering of land to the investors (preferably foreign investors) and the improvement of the employment rates and poverty through such financial sources (Hurtado Sabogal, 2011).

It is worth to say that the 90 decade represented a structural advance of the guerrilla FARC[15], which between 1996 and 2002 reached 18.000 enlisted men[16]. In fact, 6 FARC fronts that were in California at that time, kidnaped the Canadian sub-contractor of the mining enterprise Ed Leonard for more than 100 days and raised the FARC flag in the middle of California´s main square in 1999. This armed group negotiated the mining terms with this big company, being this kind of situation a failure of the State according to Hurtado (2011), until the application of the mentioned security policies, which in turn had some other important consequences that will be reported in the next paragraphs.

4.3.2 Angostura Gold Project

Greystar Resources re started its mining activity in 2003. Since then the multinational continues in the **exploration** phase. In 2009 this enterprise submitted the Environmental Impact Study to obtain the permits of the biggest exploitation open-pit gold mining project in a páramo in Colombia. Whereby, the company was intended to modify the conditions of underground mining or tunnel to open pit, which could produce up to 11.5 million ounces of gold over a period of 15 years.

Angostura was a large-scale gold and silver mining project with an investment of U.S. $ 1,000 million and with 8 mining titles. (See Figure 10) It planned to intervene 1,104.19 ha from which 1.027.13 ha were in the municipalities of California and Vetas (IAVH, 2011).

[15] Revolutionary Armed Forces of Colombia

[16] Colombia saw also the appearance of paramilitary groups during this period. They extended their criminal actions to States of Antioquia and Córdoba, affecting many legal and illegal productive sectors.

Additionally, as the Technical Concept issued by the IAVH (2011) about the delimitation of PS affirms around 60% of the project influence area was within the limits of the páramo, which was also confirmed by Greystar itself when it defined the project´s operation in areas ranging from 2,600 to 3,900 meters, including HME´s landscapes that could have been undoubtedly impacted by the mining project.

It should be noted, however, that the official technical concept was not known until March 10th 2011 and that the uncertainty about how much of the páramo could be affected by the Angostura project, remained for over a year. That was certainly a trigger in the media boom that emerged on the public opinion from the beginning of 2010 until May 31 of 2011 when finally the **Environmental Ministry denied the Environmental License of Angostura mining project**.

However, and as it is going to be explained in the following section about social organizations, the large-scale mining intentions did not stop at that moment, since more enterprises are there and together with Greystar are planning to develop their gold mining projects in PS in the coming years.

4.4 Social Organization in the Páramo de Santurbán

As a consequence of the previous, the social demonstrations in the capital city of Santander, Bucaramanga and in other cities of Colombia did not wait. Throughout 2010 and part of 2011 big crowds, expressed their opposition to the Angosturas project in areas of the PS, without knowing (at that time) how much of the páramo itself could be affected. Their arguments were directed largely against the use of cyanide in the mineral leaching process and its concerns about the potential of water sources' contamination.

Similarly, the strong arguments of the social demonstrations have been based on the intrinsic and fundamental value of the water, threatened by the cyanide, as opposed to the market value of gold and its mainly trivial uses. These demonstrations have led to several public hearings (2 public hearings until May 2013) and influenced the voluntary recall of the project by Greystar and the subsequent decision that the Ministry, adopted in May 2011; by which the Environmental License

of the Angostura project was rejected, supported in turn by the technical concept of the Humboldt Institute about the delimitation of the PS.

Despite this, the notorious fact of a considerable amount of gold in PS keeps the interests of mining companies in this area. That is why Greystar Resources changed its name (August 16th 2011), continues in the area under the new brand of **ECO ORO** trying to formulate a new mining project, now as an **underground mining project instead of the controversial open-pit exploitation** and is only one of the mining enterprises located here, especially the Brazilian company AUX. Otherwise, the social organizations are getting bigger and stronger and have been integrated into the PS Citizen Movement (MCDPS)[17].

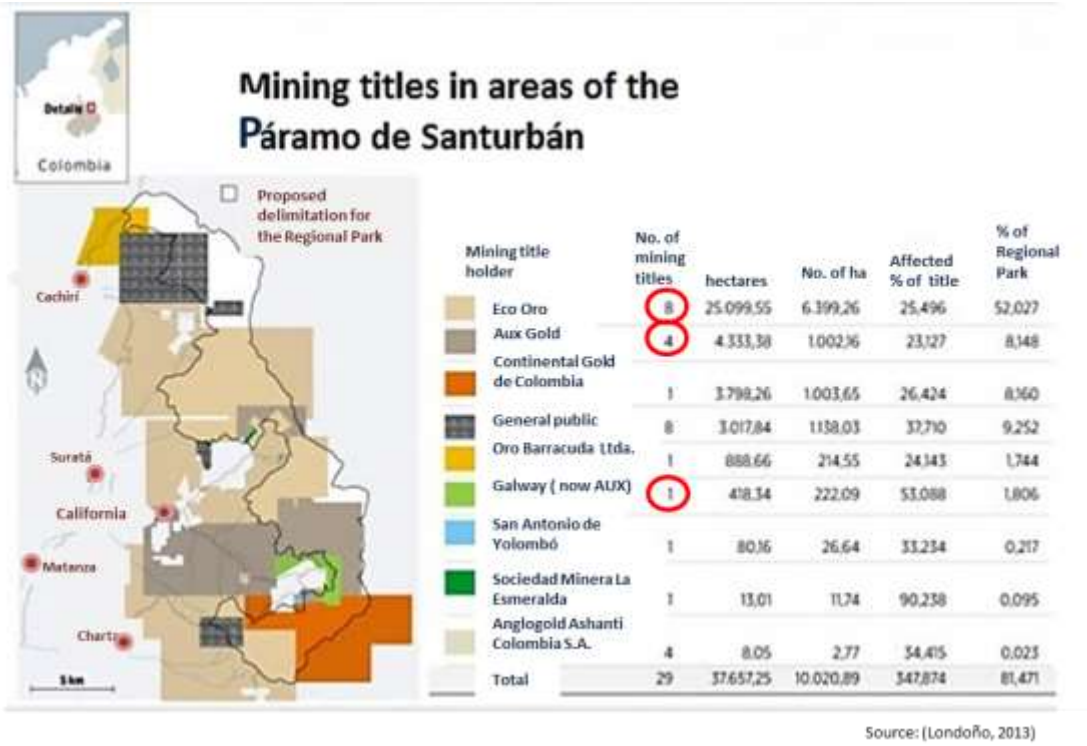
Recently, the social polarization of the studied area has increased due to the declaration of the Regional Natural Park PS in January 2013 by the Environmental Ministry and the Instituto Alexander von Humboldt; since it prohibits any productive activity in an extension of 11.700 hectáreas (Virviescas, 2013) and until now without proposing alternative livelihoods for the thousands inhabitants of California and Vetas municipalities.

Therefore, the current employment situation is an important point of conflict between community and mining enterprises, which are hiring only through cooperatives and not individually as it was before. Likewise, employment has been affected by the fact that two mining enterprises, Galway and Calvista, were bought by AUX in early 2013, which meant the dismissal of 300 workers of the latter company.

For now it is important to notice that the recent protected area had already 29 mining titles which cover approximately 81% of the Park. 8 mining titles belong to Eco Oro and 4 are property of AUX. (Londoño, 2013) (See Figure 10). Meanwhile none of the enterprises has an environmental license to start the exploitation phase, even when some of the projects have been located there since 1992, but it is somewhat disquieting that the delimitation of the park has left out the most

[17] This social organization integrates the following social sectors: Senator of commission V, Santander Assemble, Society of Public Improvements of Bucaramanga, Society of Engineers of Santander, FENALCO, Union of the Metropolitan Aqueduct of Bucaramanga, the CUT, Santo Tomás University, Defense of the PS Committee, and some NGOs.

important mining titles owned by the big companies. The environmental management plan must be issued 18 months after the declaration of the park, it means in the middle of 2014.



Mining title holder	No. of mining titles	hectares	No. of ha	Affected % of title	% of Regional Park
Eco Oro	8	25.099,55	6.399,26	25,496	52,027
Aux Gold	4	4.333,38	1.002,16	23,127	8,148
Continental Gold de Colombia	1	3.798,26	1.003,65	26,424	8,160
General public	8	3.017,84	1.138,03	37,710	9,252
Oro Barracuda Ltda.	1	888,66	214,55	24,143	1,744
Galway (now AUX)	1	418,34	222,09	53,088	1,806
San Antonio de Yolombó	1	80,16	26,64	33,234	0,217
Sociedad Minera La Esmeralda	1	13,01	11,74	90,238	0,095
Anglogold Ashanti Colombia S.A.	4	8,05	2,77	34,415	0,023
Total	29	37.657,25	10.020,89	347,874	81,471

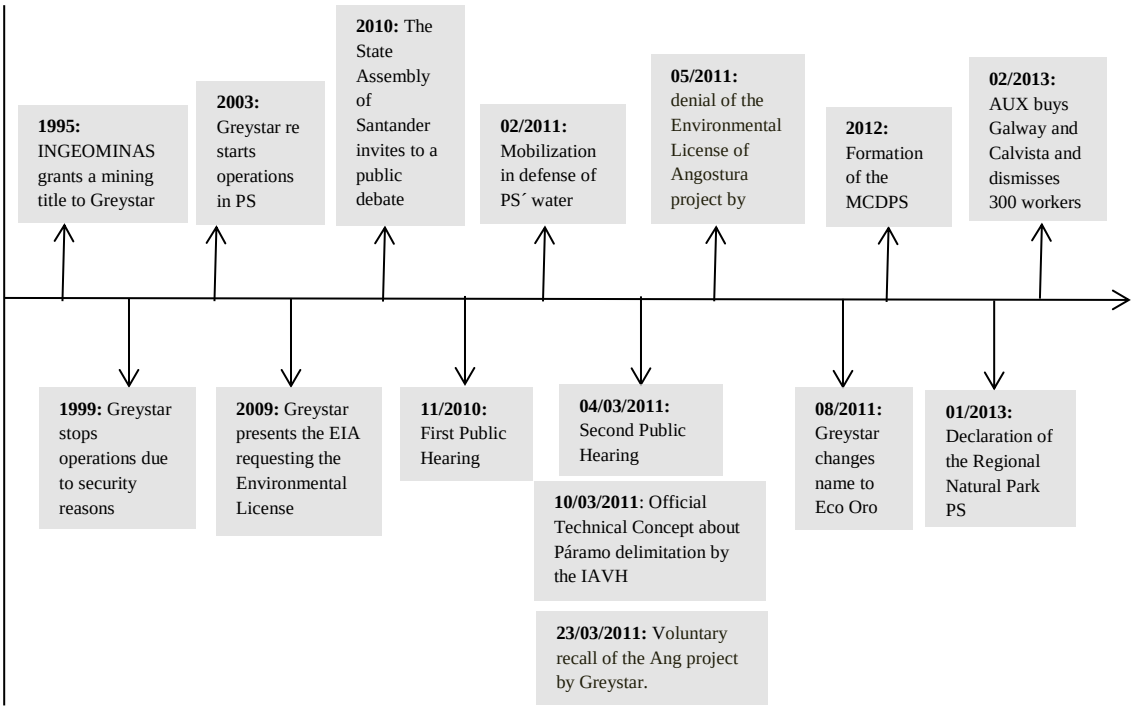
Figure 10 Mining titles in Páramo de Santurbán. Santander, Colombia, 2013

In the meantime, the debate continues[18] and, as we know, each debate has a variety of views making the situation more complex. Therefore, the theory of social representations may play a key role in the process of identifying and understanding these perspectives about mining activities and the project of Angostura in the PS.

The results of this controversy will define the sustainable development model of Colombia for the next years, particularly because this representative mining case implies the constant confrontation of the protection of a highly sensitive ecosystem with the supposed progress that mining brings to a specific region.

[18] The last big march was on 15th March 2013, where thousands of people attended expressing their dissent with the large-scale mining in PS.

Industrial mining activity in PS and the social controversy around this issue can be summed up chronologically in the Figure 11:



Source: Own adaptation based on (Hurtado Sabogal, 2011)

Figure 11 Timeline of mining history in Páramo de Santurbán. Santander, Colombia, 1995-2013

CHAPTER 5 RESULTS

"We cannot ignore a reality which is that the entire planet knows that there is gold in Santurbán and that this gold will be extracted in good or bad ways. So, the most convenient thing is for it to be extracted by the right way; generating employment, taking care of the environment, being formal (…) and increasing wealth and quality of life to the region."

Edwin Esteban

Traditional miner

The following results were obtained based on the descripted methodology in Chapter 2 and are presented basically in three parts. The first part concerns the identification of the stakeholders and its respective map; the second describes and explains the SRs about mining in PS; finally, the last part concretizes the multiplicity of the SRs in light of the conceptual framework and the interpretation.

5.1 Stakeholders of Mining in the Páramo de Santurbán

Reviewing of Secondary Information

More than 25 articles of the national newspapers *El Espectador, El Tiempo* and also *Semana* magazine, as well as of the regional newspapers *Vanguardia Liberal* and *El Frente* were collected. The secondary information included also the EIA of Greystar requesting for the Environmental License of Angosturas mining project, one special program of Caracol radio Network from January 2011 and 5 television specials of the prime-time evening newscast CM& and from the regional channel TRO, transmitted on March 2013; as well as a master thesis of 2011 about the political situation generated because of the Angosturas mining project. Annex 1 (Documentary Source of Stakeholders), provides a list of the actors and their respective sources.

Accordingly, the Figure 12 shows a stakeholders scenario composed by 16 actors who were organized in the horizontal axis according to the scales: National, State/Metropolitan and Municipal/local; and in the vertical axis according to the type: governmental, private sector, civil society and others, like the media. Additionally, the actors are assigned a graduation scale from 1 to 3 to illustrate the grade of direct or indirect affectation by mining in PS. They all exercise an

influence that goes beyond the territorial boundaries and they overlap very often, since they are parts of a whole. In the figure the stakeholders are disaggregated only for academic purposes.

It was not possible the involvement of all stakeholders due to the timeframes of field work and logistical, human and financial available resources. Nevertheless, the study involved the participation of four relevant stakeholders groups of mining activities in PS located into the metropolitan and municipal scale and highlighted with a different color in the Figure 12: Opinion leaders, large-mining companies, traditional miners and some members of California community, and Environmental and municipal authorities. The stakeholders´ choose was made with prior awareness of the researcher that a group can include more groups inside. Their roles as well as the relationships between them were identified through the analysis of the interviews.

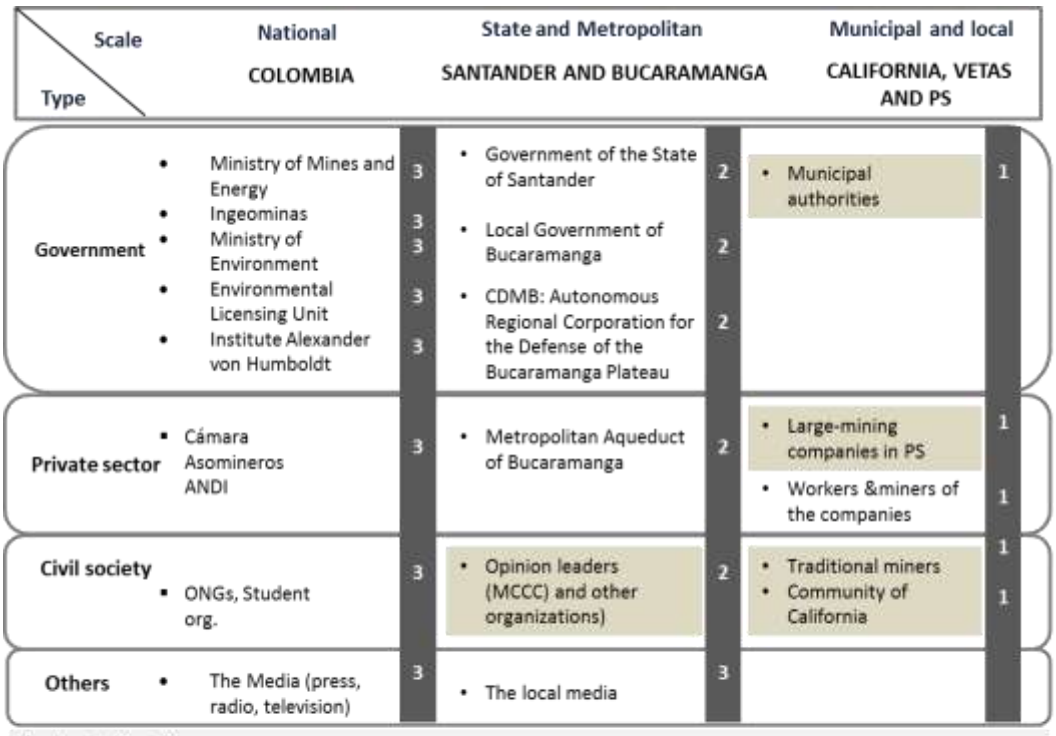


Figure 12 Stakeholders map of mining in Páramo de Santurbán. Santander, Colombia, 2013

The ***Judgment Sample*** was developed in July 2012 and April and March 2013. 7 key informants from the selected four stakeholders groups were identified: Erwing Rodríguez, Jairo Puente Bruges, José Celemín, Lina Osorio, Mauricio B., Alix Mancilla and Carlos Alberto S.

Through the ***Snowball sample*** 14 potential individuals recommended by the key informants were integrated to the study:

OPINION LEADERS

Social actor	Current occupation	Stakeholder	Evident interest
Erwing Rodríguez	Ex-director FENALCO-National Federation of Commerce Workers	Opinion leaders and Members of the MCDPS- PS Citizen Movement	Public disagreement with mining activity in PS
Alix Mancilla	Professor and environmental activist		
Gilberto Reyes	President of Society of Public Improvements of Bucaramanga		
Gonzalo Peña	Director SHYSA – Hydraulic and Sanitary Systems		
Jairo Puente Bruges	Dean of the Faculty of Environmental Chemistry. Santo Tomás University		
Rodrigo Hurtado	Political scientist, professor and Journalist by the magazine "Razón Pública"	Author of a master thesis on the political situation of Angosturas mining project in 2011	

LARGE-MINING COMPANIES

Social actor	Current occupation	Stakeholder	Evident Interest
Carlos Londoño	Sustainability Manager in AUX	Large-mining companies´ representatives	Starting the exploitation phase in PS
Hernán Linares	Local manager of Eco Oro		
Lina Osorio	Social resident of Eco Oro in California		

TRADITIONAL MINERS AND COMMUNITY MEMBERS OF CALIFORNIA

Social actor	Current occupation	Stakeholder	Evident Interest
Clara y Ramón	Traditional miners	Traditional miners and community of California	Promotion of traditional mining in PS
Edwin Esteban	Traditional miner		
Mauricio B.	Traditional miner		
Carmen Veslín	Teacher and small store and restaurant owner		
Mariam Cristina	President of Parents Meeting		
José Celemín	Principal of the municipal school		

ENVIRONMENTAL AND MUNICIPAL AUTHORITIES

Social actor	Current occupation	Stakeholder	Evident Interest
Cirio Alfonso Á	Municipal Ombudsman	Environmental and municipal authorities	Improvement of the social and environmental conditions of California
Deicy Toloza	Director of health and social management of California		
Victor Armando Árias	Mayor of California		
Juan Manuel Pinzón	Engineer and contractor by the CDMB		
Julio Mantilla	Expert professional by the CDMB		
Carlos Alberto S.	Sub-director of evaluation and environmental impact by the CDMB		

5.2 Content and Structure of the Social Representations of Mining in Páramo de Santurbán

This section presents the explanation of the content and the structure of the social representations. It is important to clarify that the core elements were identified based on the number of appearances in the interviews and taking into account that they were shared by most of the members of the respective group. A higher appreciation of the frequency codes in the

analyzed interviews can be observed in Annex 2 (Codes of the Stakeholders Analysis) elaborated using the qualitative software of *Atlas Ti* by which 81 codes were obtained from the recurring ideas and concepts in the interviews. The number of the quotations associated to each one of the codes can be seen in Annex 3 (Number of Quotations of Interviews associated to Codes)

Additionally, all the elements have been located also into the graphics, trying to keep distances and systemic hierarchy between them and the studied phenomenon.

This chapter may have extracts from interviews, which are in any case translated by the researcher.

5.2.1 Social Representation of opinion leaders about mining in Páramo de Santurbán

Opinion leaders are the stakeholders who have shown their disagreement towards large-scale mining activities in PS. Since 2010 they have been promoting the marches, integrating social organizations and issuing public considerations aimed to the civil society of Bucaramanga and to the national government; in order to generate discussion about the convenience of large-scale mining in the region. Their active participation on local and national media and the well-attended demonstrations they convene, are considered clear facts that they have influenced on the denial of the environmental license of Angosturas Project and on the submitting delay of the EIA of the remaining companies.

Thus, Figure 13 illustrates the entire SR of these stakeholders and its interlinked peripheral elements which are differentiated by their colors. It is the scheme of the cognitive system of the opinion leaders. Further, Figure 14 shows the core structure of this SR which is taken out from the general SR.

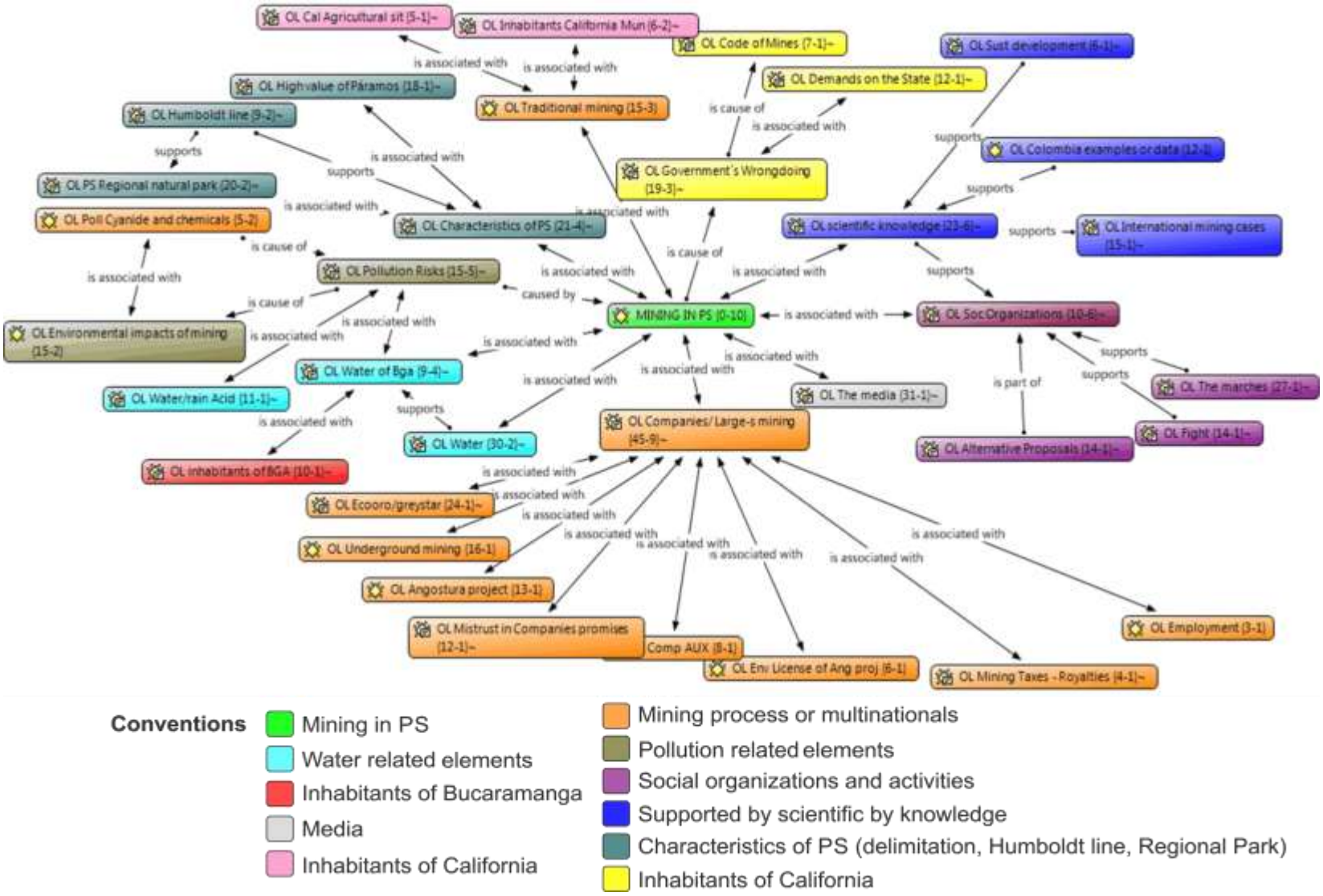


Figure 13 SR of the opinion leaders (peripheral and core elements), PS, Colombia, 2013

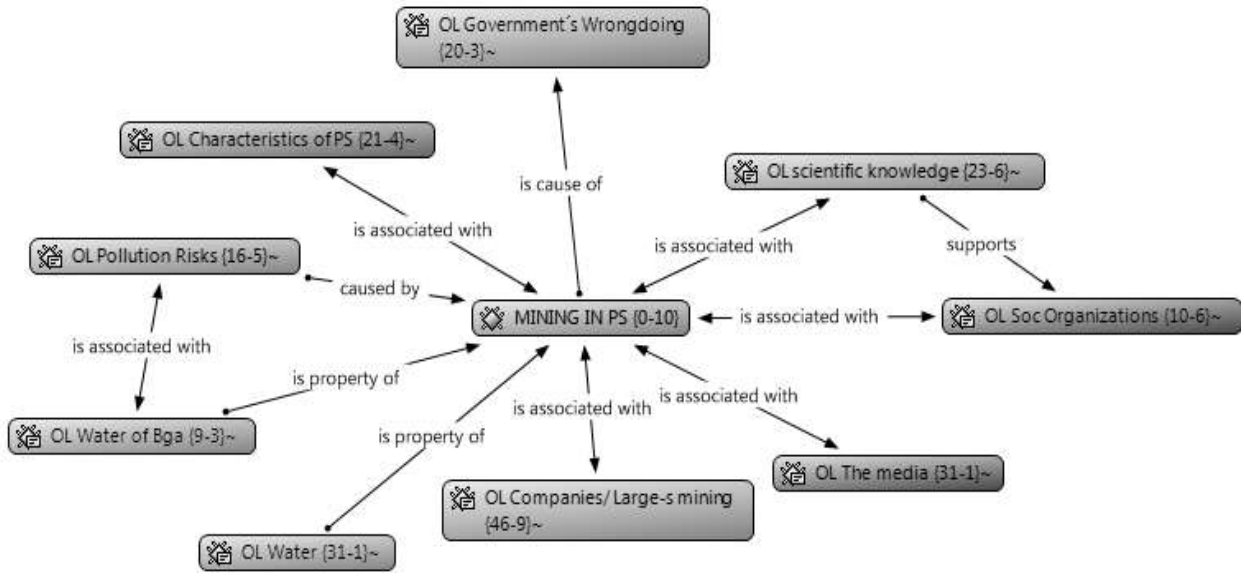


Figure 14 Core of SR Opinion leaders, PS, Colombia, 2013

As can be seen on the Figures 13 and 14, the core of this specific SR is composed by 9 elements: Government´s wrongdoing, scientific knowledge, social organizations, the media, companies/large-scale mining, water, water of Bucaramanga, pollution risks and the characteristics of PS. Similarly, those elements are the result of the shared conception by which their social order is being affected and threatened by mining.

Therefore, mining in PS is understood by the opinion leaders as a threat to their wellbeing and to their everyday life in Bucaramanga, to the extent that the drinking **water** of the city could be contaminated by the chemicals used by large-scale mining:

> *"Under no circumstances we want that our aqueduct become contaminated, it would be madness. It is like to say that in 15 or 20 years Bucaramanga would be completely uninhabited, with no possibility of drinking water since it would be completely contaminated"*
>
> Gilberto Reyes

The defense of water is based on its intrinsic value. Also, these social actors are completely aware of the **special features of the HME** of PS as the regulator of the hydric resource and support their arguments on the **scientific knowledge**, as well as on international and national mining cases. The

use of the scientific knowledge and the constant references to international mining cases made by the opinion leaders in order to justify and defend their opposition to large-scale mining, show that they complement the understanding and apprehension of their own reality with others. It occurs, since they lead to an integration of the specialized types of knowledge, which are being re-signified through *common sense* and made available to all interested inhabitants of Bucaramanga.

To this group, the dissemination of the scientific knowledge[19] related to mining, to their environmental and social impacts and especially to the high probabilities of water contamination and its consequences on the life in the city; has two clear objectives:

1. Generate and contribute to the debate from an "objective" view, which is the characteristic that science provides, since it is a set of objectified products created by the entire society[20]; trying to stay apart from a passionate position, which is normally based on emotional and subjective arguments. The possibility of holding dialogue with the mining companies in a horizontal way is also aimed by the dissemination of knowledge.

2. Motivate and integrate the average citizen into the current mining situation; insofar as he/she assumes an attitude based on scientific evidence. These stakeholders are planning to do this through, as said, the dissemination of scientific knowledge, which will offer a common social scenario with common codes for naming and classifying the, until now, strange and unknown world of mining.

The use of scientific knowledge and the integration of the citizens in the PS defense against mining can be understood under the words of Hannigan (Hannigan, 1995) as the "popularization" of the environmental claims. He also refers to the social construction of environmental problems in the center of the science due to the limitations of resources and expertise of ordinary people. So, the so called "environmentalist groups", are in charge of making the environmental issues a real concern to the public.

[19] According to (Berger & Luckmann, 2011), the distribution of knowledge is uneven and therefore there are different realities. What opinion leaders are doing is trying to incorporate another reality into theirs.
[20] In this matter is also convenient to review the definition of *scientific knowledge*, in the conceptual framework.

To achieve this purpose, the opinion leaders identify the important role of **the media**. They are aware of the huge influence and the privileged position of the media in order to change, modify and promote ideas. Likewise, the media´s importance in the SR of mining in PS was fully demonstrated in the marches of February 2011 and the generated pressure to summon the public hearings about the LA of the Angosturas project. These facts confirmed the necessity of going to the media and using them as a canal to integrate people of their external everyday life, to this mining issue.

In this order of ideas, the **social organizations** play a fundamental role, since they combine the social forces that already have a definitive position on the PS. They become a complete social context, where ideas, values, stereotypes and other can be shared; so that this group starts to have a collective consciousness and a common sense when referring to mining in PS. Today they are congregated into the Defense of the PS Committee.

The **companies and large-scale mining** are strongly anchored to the core of the SR. This type of mining is automatically linked to the region of PS, since for many of them, the debate and the conflict started when Eco Oro submitted the EIA to develop open pit mining. That is to say, they decided to be part of this *fight* until they felt affected through the risk of water pollution. The word *fight* is part of the peripheral elements of the RS, since it means the personal commitment they (social organizations) have assumed.

Finally, the last core element of this SR refers to government´s wrongdoing. To the opinion leaders this code means all the inefficiencies, the misguided decisions made by public institutions, the incoherencies of legal instruments and of some policies.

> *"This letter catches the attention of various media. The letter is of January 13th and El Espectador* [national newspaper] *takes a complete page of my appreciations and concepts on January 15th. After this, El Espectador dedicates a leading article to this: The challenge of the president Santos is to put his locomotives on the rail of the sustainable development (…) every media were important*"
>
> Erwing Rodríguez

The above quotation illustrates the relation that the opinion leaders are searching with the government and the importance of the media in this purpose. Apart from publicly expressing not being against mining, but against its development in strategic ecosystems, these stakeholders have legal support in order to identify the government´s responsibility in all this mining boom of the country. It leads to the enlargement of their knowledge and therefore to the definition of radical and critical positions; being this, the reason why they built a large number of alternative proposals that can be applied in this region instead of mining.

5.2.2 Social Representation of large-scale mining companies about mining in Páramo de Santurbán

The most important and recognized mining enterprises in this region are Eco Oro and Aux. The first of them was the owner of the Angostura project and was the one on which all the eyes turned to in 2010 and 2011. Alternatively, Aux corresponds to the biggest mining company located in California and is preparing the technical studies in an attempt to submit the EIA of an underground mining project in 2014.

Figure 15 illustrates the general SR of these stakeholders, including the peripheral and core elements that maintain the whole thinking structure (Figure 16):

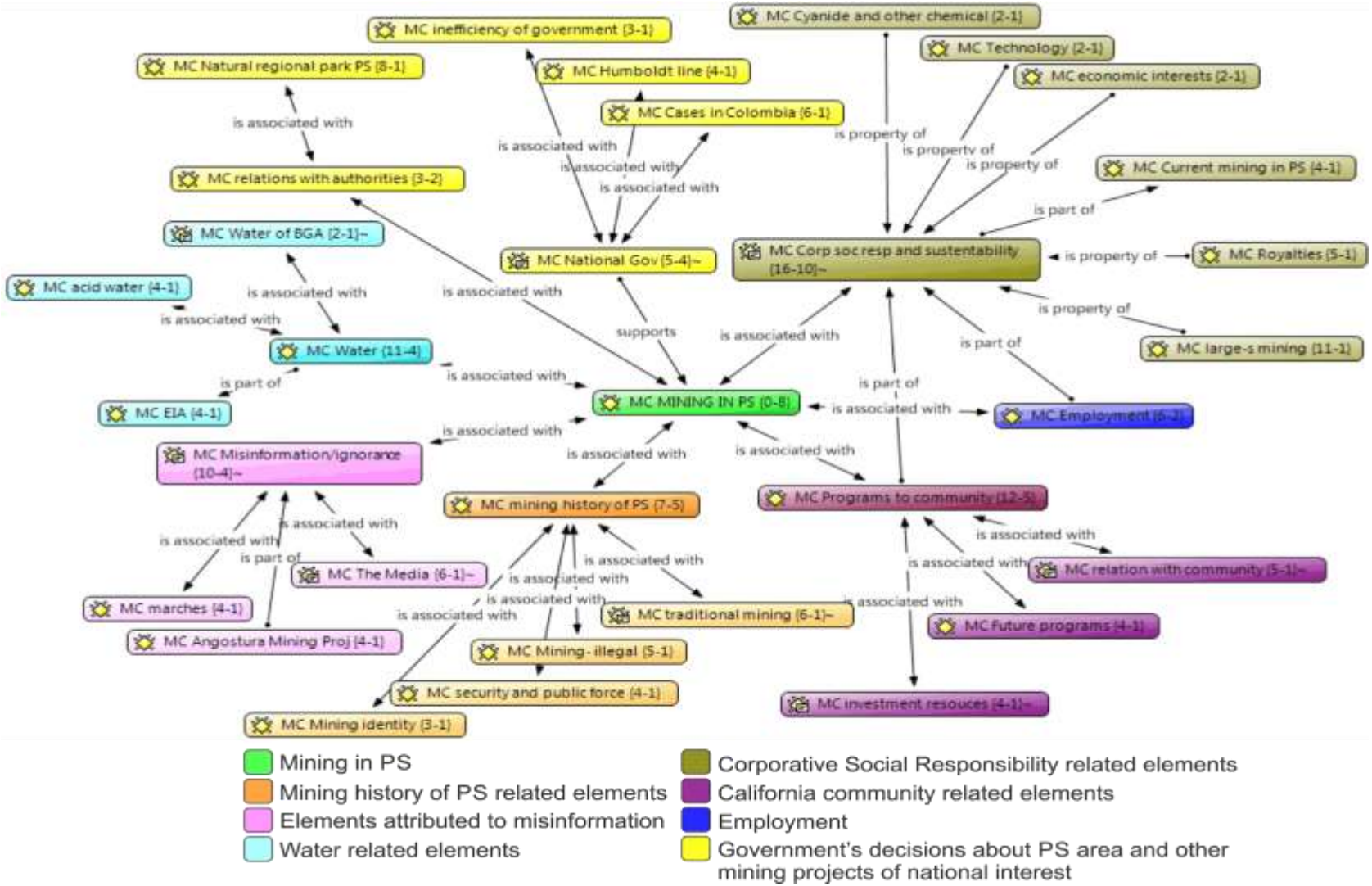


Figure 15 SR mining companies (peripheral and core elements). PS, Colombia, 2013

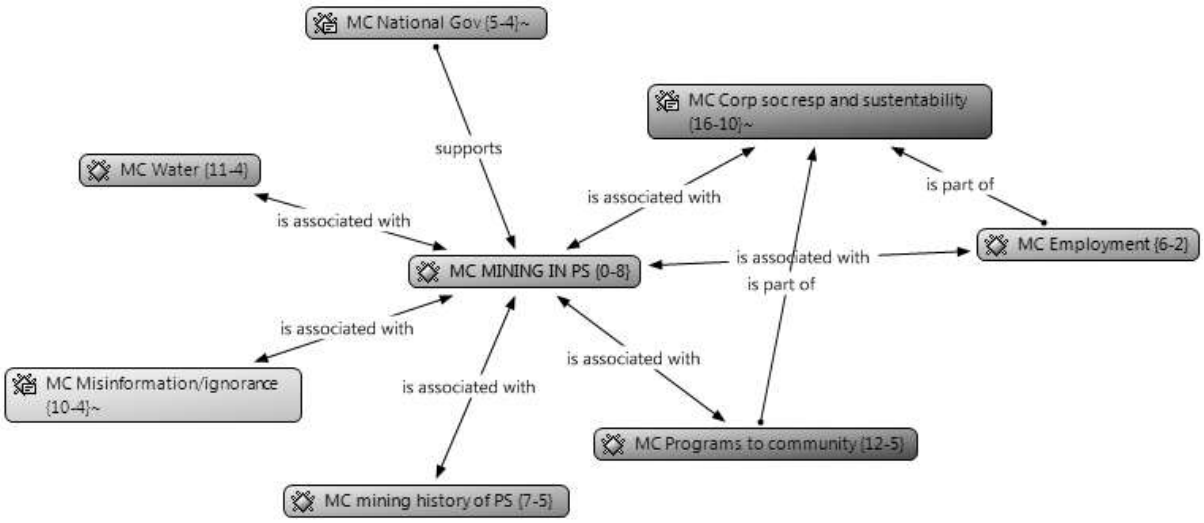


Figure 16 Core of SR Mining Companies, PS, Colombia, 2013

The SR of the representatives of the mining companies, which are going to be integrated under the name of *Mining Companies*, have seven concepts establishing the core, for instance: national government, Corporative Social responsibility and Sustainability, employment, programs to community, mining history of PS, misinformation/ignorance and water.

These social actors understand the mining situation in PS as a result of market forces and the evolution of human abilities related to the mineral´s extraction way. In fact, to this stakeholder, **mining history in PS** is evidence that proves their point inasmuch as this area has been established on the basis of mining activities. They consider large-scale mining as the last stage of the mining historic process until now; where traditional mining has been enhanced and has become obsolete and unnecessary in comparison with this modern, technological and responsible type of mining; but this is something that is addressed further. Mining history in PS covers the auto-definition of the inhabitants of PS as miners, which is understood by the mining companies as the people´s desire to promote large-scale mining in this area.

This also ties in with three of the elements present in the core of this SR such as the Corporative Social Responsibility and Sustainability, employment and the programs to community inasmuch as they recognize the importance of the opinion of the inhabitant of the direct influence area. Especially after the Angosturas project experience.

The term **Corporative Social Responsibility and Sustainability** is conceived of as a wider concept encompassing not only the mentioned elements in the previous paragraph, but also a strong justification about their mining work in the PS. For them, the sustainability in mining sector does not refer to the mineral´s conservation or to their efficient and rational administration in order to meet the current necessities without compromising the needs of the future generations; it is related to a couple of theoretical propositions about how mining sector understands sustainable development: *"First, mineral extraction and processing are processes of capital conversion, through which stocks of irreplaceable natural capital are converted into replaceable human capital; and second, wealth creation is central to the antipoverty agenda of sustainable development"* (Bridge, 2004). Thus, The SR of the mining companies is based on the idea of creating wealth and human capital through the conversion of natural capital; so that this compensates the depletion of the mineral asset.

In the same vein and to complement the above discussion, according to Dold, the only goal of sustainable approach in mining is *"to optimize the metal extraction from the ore, which by itself means to increase the financial benefits, in combination with the minimization of the environmental impact, and also minimizes remediation costs"* (Dold, 2008).

Therefore, **employment** as well as the **social and productive programs** targeting at the inhabitants of California, occupy a privileged place in this stakeholders' SR.

> *"… artisanal mining does not have the same security conditions that the industrialized mining has. There are not the same social security conditions for employed workers, do not generate the same dynamics of what we have defined as community of commitment to a society, social security contributions and the possibility of educating the children".*
>
> Hernán Linares

They are very aware of the transformation process generated by this activity and as the entire mining sector they are guided by the explained concept of sustainability. However, it does not mean that this purpose is fulfilled in the course of implementation.

Regarding the element of **national government** it is important to mention that it integrates the weak governance; which is in turn linked to the history of PS where the public force arrived to clear the area of armed belligerents years ago in order to facilitate the multinationals´ arrival. This fact shows the mining companies´ dependency on the authority and legitimacy of state power and contributes to the objectivity of their own reality insofar as it is endorsed by an institution: The State. Thus, the above provides the basis to the mining firms for explaining and justifying their mining sector, into the *legitimation* framework, which is conceived by Beger and Luckmann (2011) as an inevitable moment and a regular feature of the establishment of *institutions*.

In addition, the legal uncertainties, also connected to the concept above, refer especially to the definition of the line that delimits the páramo and the ambiguity of several legal instruments which regulate their operation activities. Likewise, the mining firms state that there is some inconsistency between the government´s official decision of becoming a mining country and the restricted and still undefined legislation to execute this decision.

Misinformation/ignorance is another of the core elements of this SR. It involves an area of knowledge which is unintelligible inside of the everyday life of common people such as the inhabitants of Bucaramanga or an average Colombian, who does not have anything to do with mining processes. The specialized knowledge of mining activity and the remoteness of its operations, and therefore of the everyday life of the Bumangueses are clear conditions of the misinformation and ignorance of the citizens about this topic. For the mining companies, this situation makes that the people do not associate the mining process with the elaboration of tools to perform their normal and everyday life. They also sustain that this is the reason for the call and attendance of the Bumangueses at the marches.

In this order of ideas, the topic of **water** represents for them the deepest confusion of the public and many of their actions are aimed to clarify their intentions of conserving the PS water in its best state.

5.2.3 Social Representation of traditional miners and community members of California about mining in Páramo de Santurbán

The traditional miners and the entire community of California can be understood as two different groups; but for academic purposes they have been integrated in one stakeholders group. Large-mining operations in this area have a direct affectation on this population even though their long history is tied to the extraction of minerals in these mountains. They have seen how mining situation has been modifying their everyday life, year after year and undoubtedly they have developed a complex SR based mostly on personal experiences, traditional and practical situations.

Several personal interests could be identified and are the basis of many conflicts inside the group. Figure 17 includes besides the core elements, the peripheral ones, while Figure 18 focuses only on the core of the SR. The connections between the peripheral and the core elements are represented by the arrows, which define the specific link that a single concept has to one that belongs to the central structure. Those links can be: is associated with, is part of, supports and is part of.

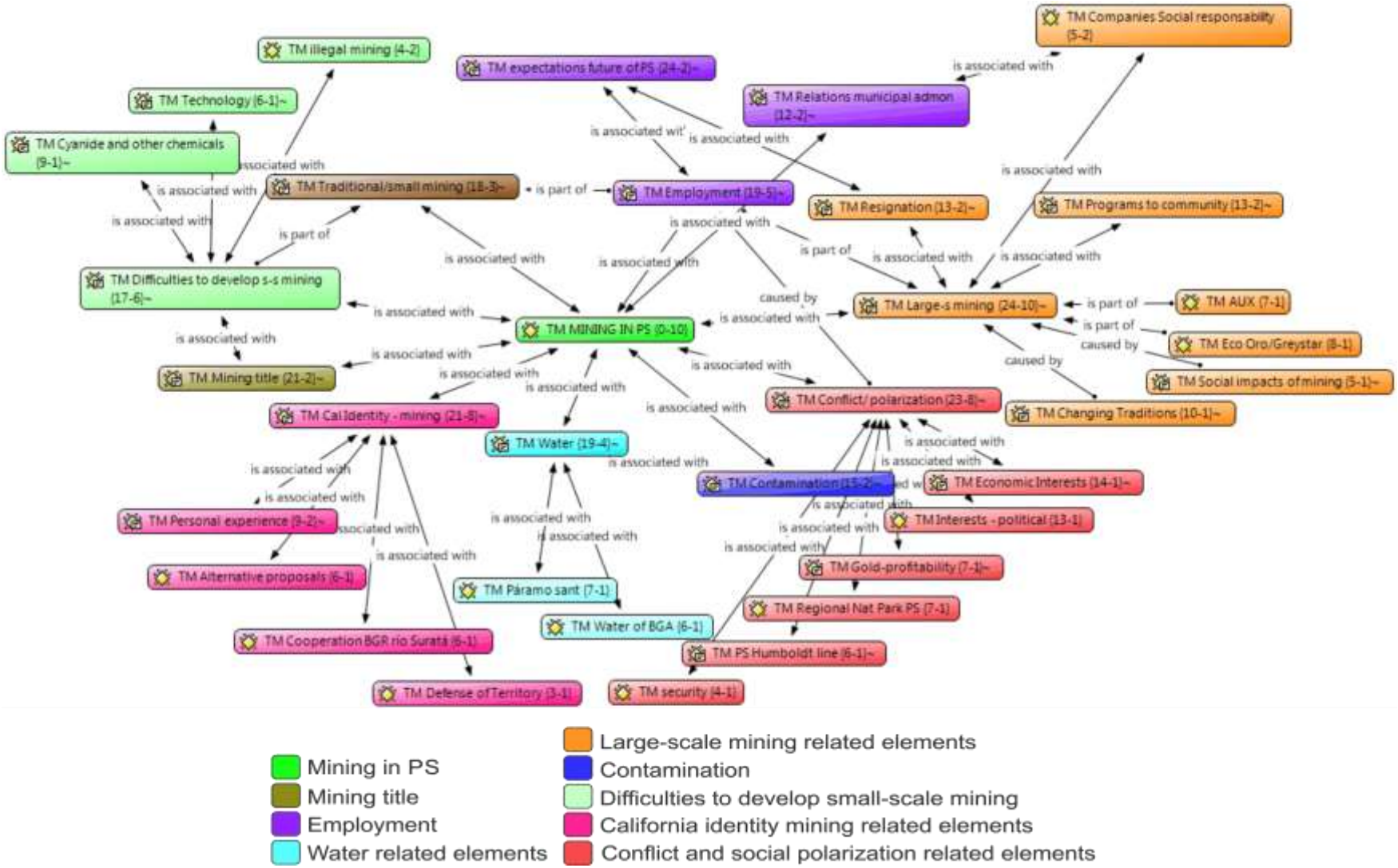


Figure 17 SR of traditional miners and community members (core and peripheral elements). PS, Colombia, 2013

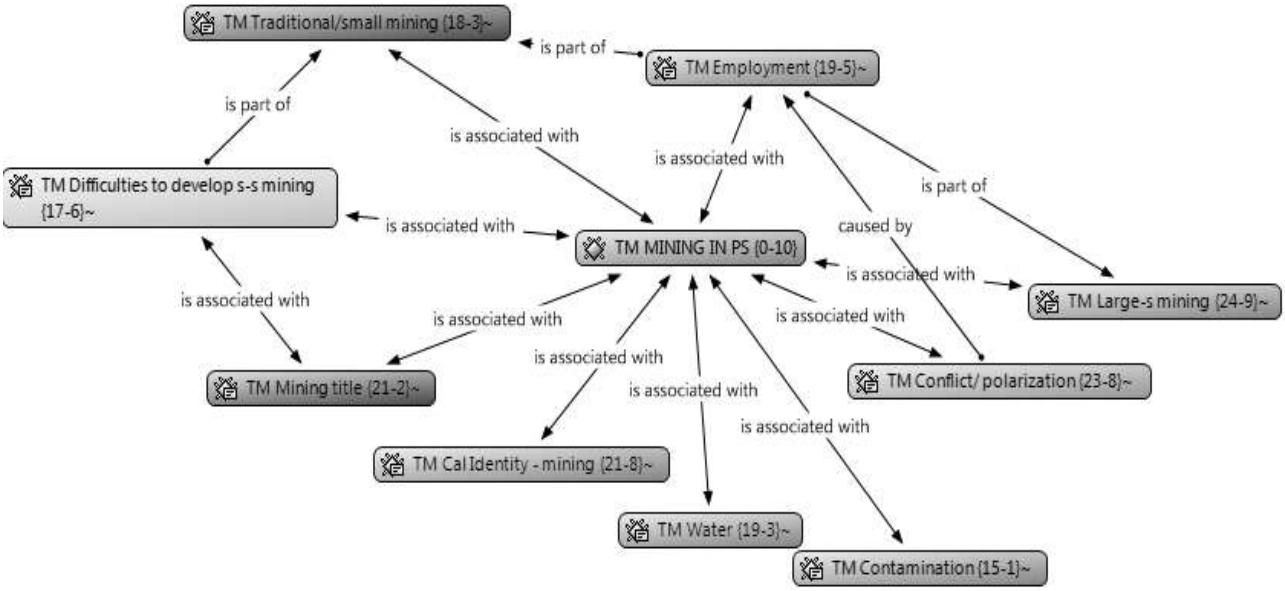


Figure 18 Core of SR traditional miners and community members. PS, Colombia, 2013

The following nine elements constitute the core of this SR, they also give shape and integrate the peripheral elements around them: Traditional and small-scale mining, employment, large-scale mining, conflict/polarization, contamination, water, mining identity, mining title and difficulties to develop small-scale mining.

In order to explain this SR, is necessary to look further back into the history of this region, since as it was mentioned in the chapter devoted to the study area, the basis upon which the Californian inhabitants developed a way of life here are the mineral deposits. This fact has led Californians to the construction of a reality where their own reason for being, their **identity** can be explained only through their mining activity. They not only perceive themselves as traditional miners, sons and daughters of miners and part of a closed miner society, but also as the privileged "owners" of the land where gold abounds and where many people are requesting for a place, including foreigners.

Hence, it is possible to affirm that the Californians´ mining identity is related to the socialization process and its respective *internalization* moment, which happened in the very early years of each one of the members of this municipality; where they apprehended their world as a meaningful social reality, around mining activities; being this their cultural template.

"Here has always been mining. Everyone had his/her mine. Mining was different before, but it has been since I remember"

Clara Pavón

According to Berger and Luckmann, *"the reality is objectively defined as location in to a determined world and can be subjectively assumed, only together with that world."*

The latter saying is linked to the **traditional or small-scale mining** inasmuch as it has been the type of extraction these people have developed in PS. Likewise they recognize themselves as small-scale miners who have been attacked and reduced by the mining policies issued by the government and that have influenced on sell or loss of their mining titles.

It is worth to mention that despite the legal channels that the multinationals have used to buy the **mining titles** in PS; some of the Californian miners affirm that the loss of their mining titles is only one of the difficulties of doing this activity imposed by the government. Those difficulties refer also to the restrictions on sales of powder and chemicals, much higher requirements in order to request for an environmental license and to the lack of investment and support targeted to this area of the mining sector, which is basically the type of mining that most of national gold mining firms develop. In addition, legal inaccuracies are contributing to the demonization of this activity, so that sometimes they are catalogued as **Illegal Miners** by the public opinion; which makes them feel upset and confused because, for them, illegal mining could be compared to illegal belligerent groups.

Their social order has been being threatened, since the independent activity from which they have been sustained and in which they grew up; is now seen by the others in a derogatory way. They are being seen indirectly obligated to sell (in some cases financial retribution is bigger than imagined), to find other livelihood in other places or to find a job by the companies.

That is how the feeling of **resignation** can be recognized in these stakeholders. This resignation feeling becomes accentuated by the fact that the developing of large-scale mining in PS and the gradually diminishing of traditional mining is becoming more and more real. Therefore, **employment** is defended from two scenarios, from the view of the few traditional miners who

claim the human right to work and from the remaining inhabitants of California who have found by the multinationals the opportunity to earn the means of living as employees.

These two perspectives of the concept employment are being incompatible and are leading to some **conflicts** into the social life of the municipality, since they divide the expectations, the wishes and the attitudes of the Californians. So, if there are intentions of doing a deeper social study about this phenomenon, is possible that more than two SR belonging to this group might be identified.

However, the **conflicts** not only involve the relations between members of the community, but also relations of traditional miners with the multinationals and with the municipal authority, as is going to be explained below.

On one hand, Californians claim their natural right to be hired by the mining enterprises since these are using their land and taking advantage of their historic activity. On the other hand, municipal authority, headed by mayor Victor Armando Árias, has taken the role as coordinator of assisting and supporting the social investment of the enterprises targeted at the California´s community in an attempt to generate long-term social productive projects. In any case, this official intention is conceived by some members of the community, as acts motivated by personal and economic interests.

The disagreement´s sphere includes also, what they consider to be is a wrong idea of the environmental organizations of Bucaramanga, related to **water contamination** made by the traditional mining in this area. At this point is necessary to clarify that, although the social demonstrations made in the city do not blame the traditional mining of any of these charges, the public defense of the HME´s conservation and eradication of large-scale mining certainly includes a tacit judgment about all types of mining in PS.

Finally, and in order to make clear this point, the observed shared knowledge based on the primary socialization process of Californians strongly guides their attitudes and is apparently very weak complemented by other secondary socialization processes; e.g. is was revealed the lack of national and international references that could usefully supplement the arguments behind the

discomfort or the expectations they are experiencing. In other words, the lack of other realities into their discourse makes them vulnerable to the willingness of political and administrative decision, since they do not argue and defend their positions in a united and *objective* way.

5.2.4 Social Representation of California municipal administration and environmental authorities of Bucaramanga about mining in Páramo de Santurbán

The last studied stakeholders are the authorities. This group is composed by the municipal administration of California represented by the mayor, the ombudsman and the director of health and social management; and the environmental authority of the CDMB in Bucaramanga. Their RS of mining in PS can be observed in the Figures 19 and 20. Nevertheless, it is important to mention that even though the differences between the regulatory approaches and the uneven relations they have with the other stakeholders (community members, opinion leaders and mining companies) were recognized from the beginning by the investigator; their integration into a SR was chosen in order to generate a wider view from the governmental side.

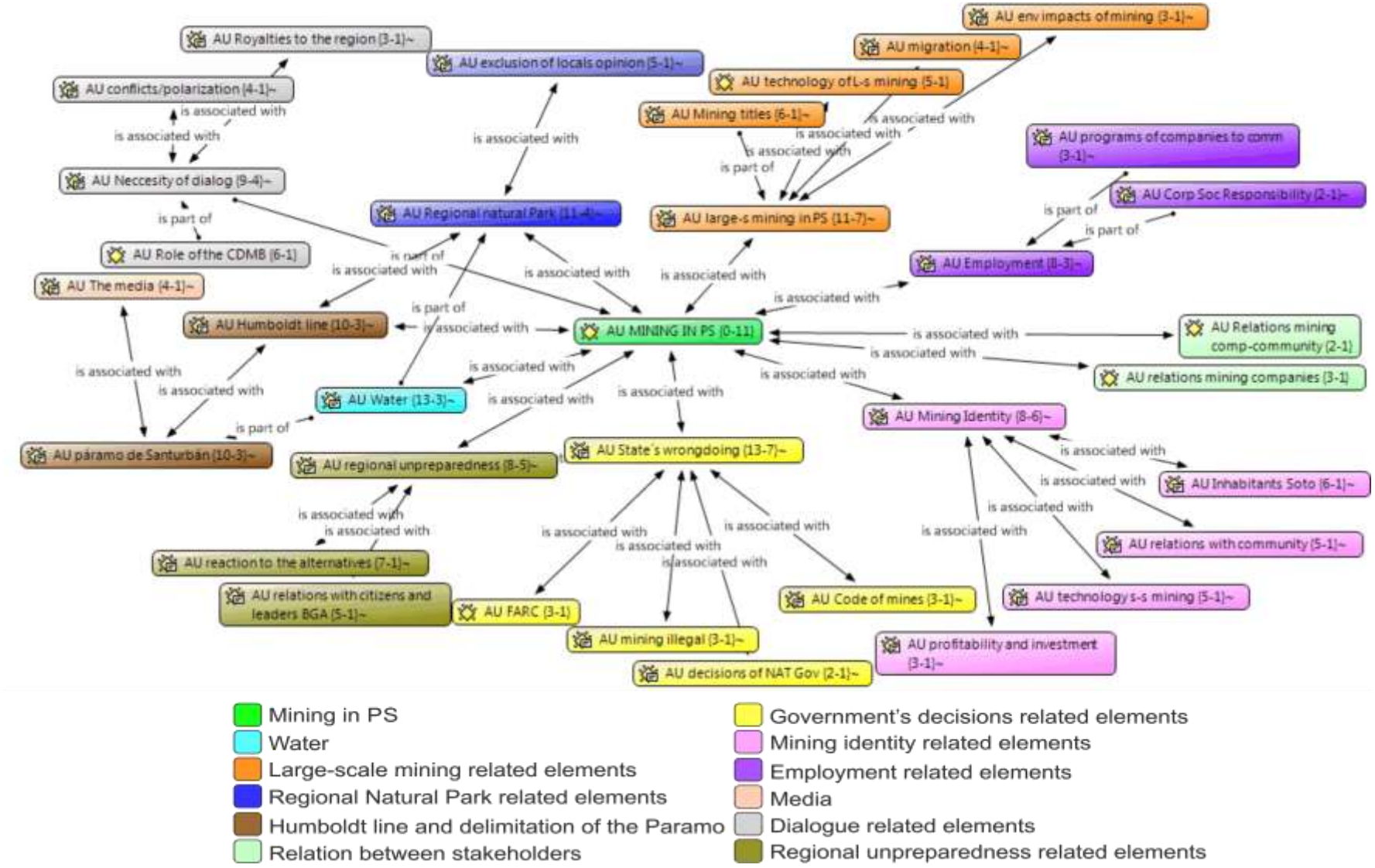


Figure 19 SR of municipal and environmental authorities (core and peripheral elements). PS, Colombia, 2013

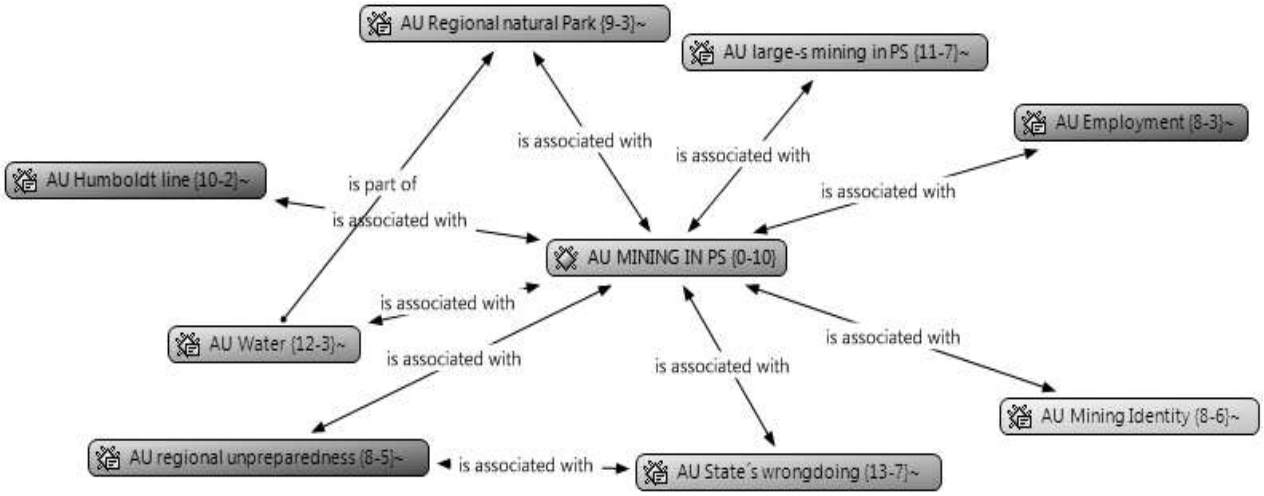


Figure 20 Core of the SR of Authorities. PS, Colombia, 2013

The overview of the SR allows the identification of the core and the perioheral elements that are linked to them. Eight core elements were identified: Regional Natural Park, large-scale mining, employment, mining identity, State´s wrongdoing, regional unpreparedness and Humboldt line.

Trying to define the social, economic and environmental terms for mining is a hard political work. The political sphere is in charge of determining the playing field for the mining operations, the social participation and the regulation of the relations between them. An example of this is contained in the concept of **Humboldt line**, which refers to the still very diffuse delimitation of the Páramo de Santurbán. Notwithstanding this delimitation is a task of the national government, more precisely of the Environmental Ministry and the Alexander von Humboldt Institute (IAVH), the social consequences of this technical problem fall on the CDMB and the Authorities of California.

The Humboldt line is a fundamental point in the debate and exercises a direct influence on the relations between the stakeholders, since it has many interpretations, according with the interest of each one of the actors. This variety of interpretations and interests is accentuated by the fact that the current delimitation of the páramo is the result of an illustrative and informative publication made by the IAVH, which is not binding and lacks technical and socioeconomic studies.

This latter is exactly what municipal authorities consider about the declaration of the **Natural Regional Park** and disagree with it; since, according to them, the CDMB did not take into account the observations and the livelihood activities of the inhabitants of California municipality, which now are seen affected by the prohibition of productive activities inside the protected area. On the contrary, for the CDMB representatives, the declaration of the park is definitive and was done seeking to reconcile the various points of view, especially the legal implications of letting inside the park the extraction mining titles of the most important enterprises[21]; so that the next step is the Environmental Management Plan, which is going to involve the community participation.

To make it clear, the national government still has to issue a definitive and binding delimitation of PS while the CDMB has to issue the Environmental Management Plan for the activities regulation in the Natural Regional Park. Both official documents are important to define the terms in PS.

Additionally, these stakeholders consider **large-scale mining** as a national decision on which they do not have any power of interference. As the rest of the studied groups, authorities share the feeling that transcendental decisions are out of their reach. Besides, they recognize the financial benefit that represents the mining projects for the region.

However, according to these actors, they are assuming an active and proactive attitude towards the current mining situation in PS, to the extent that the Corporative Social Responsibility programs and the environmental impacts can be controlled and regulated; the benefits in the region are going to be evident and are going to contribute to the regional development. They sustain this based in part on the mining royalties.

The following aspect could represent a meeting point between the municipal authorities and the opinion leaders. It is regarding to regional planning and research, although with different approaches. The first group refers to the necessity of identifying and delimiting areas rich in mineral that could remain outside of the protected zone, while the second group proposes a

[21] According to the interviewed authorities, the declaration of the natural regional park finally was of 11700 ha, even when they could have declared as park 20000 or 30000 ha. This is so, because they did not want that the protection was effective only on the paper, but in the páramo area; which could not be if they would have not taken into account the current mining titles and the licensed economic activities in that place (this includes the mining titles of the multinationals).

period of 10 years with no presence of large-scale mining to do technical, social and economic studies in PS; in order to define those areas, the ore quantities, the human capital of the region and generate a number of social development projects with participation of the community.

This is also linked with the core elements of **regional unpreparedness** and **State´s wrongdoing** inasmuch as many of the problems they perceive, such as the conflicts between community members and authorities, environmental organizations and traditional miners, multinationals and community and multinationals and opinion leaders; are a consequence of making decisions without having enough information, without dialogue and without preparing the whole region for the large-scale exploitation and change over the phase that they are now experiencing. For them, regional unpreparedness addresses too the malpractices of former municipal administrations, which were focused on short term actions and contributed to a worsening of many economic, social and infrastructure issues of California.

With this in mind, the State´s wrongdoing is also connected with the unpreparedness, since the local mentioned conditions are a reflection of the national policies:

> *"There are really many things, because the openness to mining topic was so fast, precisely with Law 685, that finally the environmental authorities and even the Ministry, could not develop the previous studies in order to determine the excludable zones from mining activities and through this, mitigate the impacts"*
>
> *Juan Manuel Pinzón*

Likewise, for authorities, **employment** offered by the multinationals in the municipality of California has to be an important and essential part of the social agreements. They are aware that the large-scale mining in this area is inevitable and expecting to construct the less traumatic and inequitable process for the communities and the environment of PS. So as it was mentioned in the SR of the stakeholders of miners and Californians.

Regarding to the **mining identity**, these stakeholders recognize the history of the region and despite they know the strong social and economic impact that the large-scale mining will bring to the traditional miners, they also know that the goal is a long term substitution of the economics.

Hence, they consider they can achieve this, by the intervention of the social investments of the multinationals and the organization of the direct royalties, which is the purpose of the mayor.

Thus, it can be seen that **the State** as an essential institution, with historicity and objectivity, with the coercion mechanisms and the cohesion characteristic that embodies all the institutions; it is perceived by the authorities, who are in turn the representatives and guardians of the institution´s social order, as an external objectivity, where they barely can have some influence and the only option they have is to propose solution for the problems that the State itself generated. Finally, they consider that the previous work has not been made; that is the respective analysis and studies that could help the high mountain ecosystem and Californians to be better prepared to cope with the large-scale mining.

> *"I think that the whole State is like this, the whole country; there are zones where there is really no governability of the State, even it is wished. Then one makes reflections at the end and says: well if the objective is to consolidate that figure of Natural Parks, then yes. Because, one sees to the mirror or the reality of other situations, for example the Farallones Park and it is full of illegal mining. So, one makes the balance about what generates bigger impacts whether legal mining or illegal mining. Legal mining at the end can be controlled and there are the regulation tools, but the illegal one… Behind that, there are many things"*
>
> *Juan Manuel Pinzón*

5.3 Multiplicity of the Social Representations

The discussion, interpretation and joint analysis of the studied SRs related to the mining activities in PS will be presented below.

When analyzing the SRs of the opinion leaders, the mining companies' representatives, the traditional miners, the California community and the authorities; all those different backgrounds play an important role. The history of each group´s specific social context exercises an influence on the stereotypes, opinions, beliefs, values, interests, norms and classificatory logics that regulate the attitudes and therefore the ways to relate socially and communicate with the other

stakeholders (Rodríguez Salazar, 2011). This cognitive heterogeneity leads to the presence of misunderstandings and false expectations, among other communication problems. To determine common elements of the stakeholders´ cognitive systems, the dimensions of the SRs are going to be addressed:

5.3.1 Information

This dimension refers the *type* and source of information inside of each stakeholders´ SR, as well as analyzes its *amount* and *quality*.

5.3.1.1 Type and source of information

The predominant type of information inside the representations comes from the **scientific knowledge** since three of the stakeholders refer to it to justify their positions (opinion leaders, mining companies and authorities). The SR of the traditional miners draws more on the personal experience and the primary knowledge.

Firstly, it must not be forgotten that among members of the opinion leaders group there are academics and experts in different areas and their backgrounds allow them to consult available, updated and pertinent information to confirm their suspicions about the risk of water pollution and consequently to enrich the arguments and explications about why large-scale mining is not convenient for this strategic ecosystem.

Secondly, while the information of the mining companies stems also from science, it clashes with the information that the previous group holds. It occurs due to the points of view from which they concentrate. This group pays little attention to studies or mining cases that have had negative impacts on natural resources and on social conditions of the locals. It does not mean that they ignore those impacts but that they emphasize the economic benefits from the operations based upon their interests. Their actions are oriented by information and examples from international mining operations, and they are very often cited in their discourses as a guarantee of success in the future if the Environmental License is approved.

Thirdly, it is clear that the source of the information that the authorities hold is technical and institutionalized and although they are not the authors of this type of knowledge, they are the guarantors of the mining operation standards in the PS. Explicit information about mining impacts is, as it occurs with the other groups, referred to water. However, their core elements focus more on the legal aspects that regulate the extractive activities.

The traditional miners/community of California has obtained the information, from which their SR is built, based on their **personal experience**. They have seen the contamination caused by mining through the years, e.g. the absence of fishes in the close rivers (La Baja) and applying their "by doing knowledge" they have learned to minimize it inasmuch as, aside from earning money from this activity, they have never suffered from lack of water. Apart from this, the insufficient data certainty was observed through the analysis of the interviews, which allows us to conclude that a high amount of the information they hold, has its roots on the perception and the observation of their natural, social and political changing world, as well as on the information of the media.

Nevertheless, the above does not mean that the SRs are made of scientific knowledge; they have re-signified, interpreted and integrated some of that information into common sense to build their cognitive system about mining in PS.

5.3.1.2 Amount of information

All cores of the SRs are loaded with a lot of information. As mentioned above the scientific and technical information is held by 3 groups while the traditional miners and the community of California based their elements of the SR mostly on personal experience and primary information.

Frequent organization of workshops, meetings and academic events that the opinion leaders make, leads them to share new information about gold mining and its social and environmental impacts, so that the previous knowledge is completed, reaffirmed and enhanced. Likewise, they have been issuing informative material in an attempt to spread up the exclusive knowledge with the bumangueses in order to ensure that the citizens are kept informed about the water they consume and the risks that large-scale mining represents.

Mining enterprises deal also with a high amount of information since it is necessary to the elaboration of the respective EIA. Besides, a lot of information about the PS and mining in general is required to respond to the criticism and interrogations from the civil society. Like the opinion leaders, representatives of the multinationals consider that the dissemination of the information is also important to reduce the confusion and fear that the average bumangueses have about the possible contamination of water, due to this economic activity.

In regard to the environmental and social impacts of large-mining activities in PS, the traditional miners answered ambiguously, and as it was said before, with little amount of conventional or institutionalized information. Despite this, they affirm that large-mining operations have greater damages on the ecosystem and on the production of acid water; than the small-scale extractions. Most of the information on which they base their SR is about the traditional mining process itself.

Authorities possess high amount of information mostly about the mining legal instruments. Likewise, they devote much time understanding and apprehending the regulatory decisions that the central government makes. Those decisions are also understood as an external issue for this group and their actions respond more to the remediation and control, than to the prevention and planning, since in front of large-scale mining, they recognize the passive role they play.

5.3.1.3 Quality of information

Closely linked to the previous two concepts is the quality of the information. Quality in this case has to do with the *stereotypes* and the basis of them inside of the SR. Thus, the stakeholders have stereotypes which are dependent of the source of the information and on the specific social contexts where they develop themselves.

Californian traditional miners have apprehended the mining processes and related topics, through the practical experience. This means that what they know about large-scale mining in PS is because, either they have experienced it or they have heard from it through their neighbors. Their short term vision, which is product of the difficult living conditions and the abandoning from the obligations of the State, leads to a lack of external references to evaluate and understand their own situation. Therefore the information of their representation is incomplete, in comparison to

the other stakeholders´ SRs. It is important to mention that some places of the representation without explicit information are completed by suspicions and emotional assumptions.

On the contrary, the opinion leaders, the mining companies and the authorities count on reliable information to sustain their SRs. Indeed, representatives of mining enterprises have also privileged information that can be used in their favor.

According to the explained dimension of the SRT information, it can be said that most of the core elements of the representations are intertwined within and by the scientific and theoretical knowledge, which is used to legitimize the group´s intensions. In this regard, the contributions of Berger and Luckmann (2011) may help; scientific knowledge is only a small part of the entire knowledge; however for the society it is also in some way, the most important. It is because it provides probable explanations to a larger number of realities. The media play also an important role in its distribution.

The above means that the information on which the SRs are based promotes the unequal **power relations** where the traditional miners group is at disadvantage in relation to the other groups.

To complete this part of the topic, differences in terminology that the stakeholders are using are relevant. The groups are gaining more cohesion since they are sharing not only knowledge but also terminology. However, outside the groups and because of the uneven distribution of knowledge, confusions can be generated, for instance the topic of acid water. For Authorities as well as for the mining companies, acid water is an environmental passive that is related to the especial features of soils of PS while for the opinion leaders this is caused by the ongoing large-mining operations. Both can be right because as presented in the Chapter 3, this water acidity is a result of the high quantities of sulphides in the rocky rubble while in contact to the air.

Based on the general analysis it can be highlighted the conceptual versatility immersed in all SRs, insofar as many elements are shared by the stakeholders but are understood by them in very particular and different ways.

5.3.2 Field of the Social Representations

As it was said before, the field of the representation refers to the organization of its **content** (Mora, 2002). Thus, the core elements of the four stakeholders can be hierarchically observed in Table 6, together with the number of quotations, where each concept is mentioned. The last column shows the shared concepts by all, by three or by two of the social actor groups and are highlighted with different colors to facilitate their visualization in the hierarchy levels. These latter are illustrated in the vertical axis of this table.

The organization of the concepts into the hierarchy levels was made taking into account not only their frequency of appearance in the discourses, but also the links established with the other elements of each SR. This is therefore responding to an interpretation process made by the researcher.

Firstly, the core element with more references in the discourse of the opinion leaders is the large-scale mining and the companies developing this activity (45 quotations), followed by the media (31), water (30), scientific knowledge (23), the characteristics of PS (21), Government´s wrongdoing (19), risk of pollution (15), social organizations (10) and water of Bucaramanga (9).

For the representatives of the mining companies, seven concepts are establishing their core: Corporative Social responsibility and Sustainability (16), programs to community (12), water (11), misinformation/ignorance (10), mining history of PS (7), employment (6) and national government (5).

In the case of the traditional miners, large-scale mining (24) takes the first place, after that is mentioned the conflict/polarization (23), mining identity (21), mining title (21), employment (19), water (19), Traditional and small-scale mining (18), difficulties to develop small-scale mining (17) and contamination (15).

In addition, the SR of the authorities has this hierarchy: State´s wrongdoing (13), water (13), Regional Natural Park (11), large-scale mining (11), employment (8), mining identity (8), regional unpreparedness (8) and Humboldt line (10).

An interesting aspect is the fact that the traditional miners recognize and have on the second level of hierarchy: the element *conflict and polarization*. This can be understood as the self-perception of being in the middle of the social and environmental conflict, where they do not have any kind of power or active participation in the decision making processes as it has be shown in the exclusion of their opinion and voices on the declaration of the park in early 2013.

Table 6 Field of the representations

Stakeh. / Levels of Hierarchy	Opinion leaders	Mining Companies	Traditional miners	Authorities		Common concepts
1	large-scale mining and companies (45)	Corporative Social responsibility and Sustainability (16)	large-scale mining (24)	State´s wrongdoing (13) -Humboldt line		water (73)
2	the media (31)	programs to community (12)	conflict/polarization (23)	water (13)		Large-scale mining (80)
3	Water (30)	Water (11)	mining identity (21)	Regional Natural Park (11)		
4	scientific knowledge (23)	misinformation/ignorance (10)	mining title (21)	large-scale mining (11)		Employment (33)
5	characteristics of PS (21)	mining history of PS (7)	Employment (19)	Employment (8)		
6	Government´s wrongdoing (19)	Employment (6)	Water (19)	mining identity (8)		Government (37)
7	risks of pollution (15)	National government (5)	Traditional and small-scale mining (18)	regional unpreparedness (8)		
8	social organizations (10)		difficulties to develop small-scale mining (18)			Mining identity/history (36)
9	water of Bucaramanga (9)		Contamination (15)			Pollution/contamination (30)

Source: Author, 2013

As it has been seen in Table 6 the following common concepts were found: water, large-scale mining, employment, Government decisions, mining identity/history and pollution/contamination. Since each one of the groups understands the elements from different points of view, due to the

facts mentioned along this complete chapter, the common items together with their particular meanings are illustrated in Table 7. This Table sums much of the complete chapter of results.

Table 7 Meanings of the SR´s common elements

Stakeholder / Common Elements	Opinion leaders	Mining companies	Traditional miners	Authorities	Shared by
Water	Life in Bucaramanga	Conflict with the other stakeholders	Livelihood	Protection	4 groups
Large mining	Greystar/Eco Oro Water contamination and scarcity	----------	Pressure Threat	Opportunity of economic progress of the region	3 groups
Employment	----------	Corporative Social Responsibility	Right to work	Obligation of companies	3 groups
Government	Contender Promotion of incoherent laws (protection vs. mining)	High institution with Low/inefficient capacity	----------	External laws, decrees and orders	3 groups
Mining identity/ history	----------	People´s desire to promote large-scale mining in this area.	Right to work	Necessity of economics' substitution	3 groups
Pollution/ contamination	Main consequence of large-scale mining in PS	----------	Caused by chemicals of large-scale mining	----------	2 groups

Source: Author, 2013

Elements in Table 7 are closely linked to the local and national context, since when opinion leaders refer to water, they defend its protection and conservation with the recognition of the strategic ecosystem of páramo by official and legal documents issued by former and current governments. It means that they are including the government official positions in the group´s intention of suspending the gold extraction in the PS.

The social representations of the studied stakeholders meet all at one concept: **water**

This essential element is the basis of the opinion leaders group, even though it is more focused on the water that the PS provides to the city of Bucaramanga and the risks of pollution due to the large-scale mining. Likewise, this is also a concern for the CDMB.

Otherwise, water is for the enterprises representatives the spanner in the works for any attempts of concluding agreements in mining field. This element is the reason why the social organizations in Bucaramanga attracted the attention of hundreds of Colombians across the country in 2011 and this is also the element that they sustain is being protected by them (this should be confirmed by the EIA that each company is preparing). Nevertheless, it has been observed that mining companies have assumed a defensive attitude when asked about water. They are deflecting the attention towards the water contamination produced by Colombian cities and are totally convinced that their industrial mining activity will not affect the hydrological cycle of the PS.

Finally, for traditional miners water represents one of the livelihoods, since is through their river flows, that they have been able to do the "barequeo" or gold panning for many years and generations. In the same vein, they affirm that the traditional mining is compatible with the protection of the hydric resource and that they should receive some kind of recognition for being the guardians of the rivers that supply the city of Bucaramanga. Furthermore, they are experiencing a feeling of discrimination as well as the sensation of being judged and reproached by the Bumangueses due to an activity that they are practicing since they remember. This latter, because, according to them, the citizens are concerned about their water supply, threatened by the large-scale mining.

In regards to large-scale mining, the subject is referenced most of the times with reasons that explain economic interests of this industry and the employment it generates.

5.3.3 Attitude

The overall analysis of the previous dimensions and the explanation of the content and structure of the SRs, together with the already known public expressions of the stakeholders; lead to the identification of some emotions and affective signs that exercise influence on each groups´ attitudes.

Firstly, in the case of the opinion leaders, such emotions expressing fear, mistrust and uncertainty are essential to the formation of their SR of mining in PS. For this group, a negative valuation of large-mining was developed before the other studied elements and was indeed the motivation to search for more information about it. The **fear** is an emotion that showed up repeatedly in the

discourses when they explained their participation in suspending the large mining due to the risk of contamination of the Bucaramanga´s drinking water. This is the only group expressing this feeling.

Furthermore, **mistrust** is shared by this group as well as by the traditional miners and is related to the mining companies´ promises and to the government decisions. This latter finds its roots in the history of Colombian mining policy descripted in Chapter 3, since many of official regulatory tools (e.g. Code of Mines) have demonstrated interest in benefiting the large mining industry in the country. Likewise, the mistrust of the opinion leaders towards the CDMB obeys also to the fact that only 11700 ha of the páramo were declared as Regional Natural Park and remains concern about the organization and distribution of that area which could be dependent of the interesting mining spots. In regards to this, traditional miners manifest this feeling when they refer to the mining legislation and the government's intentions aimed to support small-scale mining.

A third important feeling that orientates the attitudes of the stakeholders is the **uncertainty**, which is present in all groups and becomes clear when:

- Opinion leaders advocate *development demands* that could be applied in the PS (connected to the social organizations and graphically represented in their SR as *alternative proposals*).
- Mining companies (AUX) dismiss 300 employees until definitive legal regulations are issued.
- Traditional miners try to continue with their activities even without a mining title and wait with clear resignation, the future political decisions.
- The municipal/metropolitan authorities draft up an environmental management plan with the volatile national economic and political context, being aware of the fact that on that future plan enforcing the measures, control and regulations might result in being a constant inefficient method.

Moreover, the multinationals as well as traditional miners experience a **feeling of being attacked** by the society and the mining legislation, which orientates their attitudes to a defensive position.

That attitude assumed by the mining companies can be found in the last informative material (large-mining passbook distributed in Bucaramanga) issued by large-scale mining industry in Bucaramanga, where states the contamination of water is more likely caused by the city´s wastes than by the extraction activity. They consider people have been misinformed about large mining and this is the reason for their opposition to the activity.

In the case of the traditional miners, their attitude influenced by this feeling can be observed by their recent participation in marches where they claim their right to work and their disagreement with the national mining policy. According to them, this is generating a collective stigmatization by the rest of the national society and contributing to their negative connotation as “illegal” miners.

Lastly, the attitude assumed by the opinion leaders has a negative orientation and is product of the exposed reasons (fear of water contamination).

In the same vein, it is worth to highlight the dual orientation that the attitude of the SR of the traditional miners has. It is negative towards the large mining as a consequence of the increasing legal requirements to develop their productive activity and the general stigmatization suffered by the national media. Concurrently, their attitude to small-scale or traditional mining is positive since many cultural, historic and even familiar aspects justify the gold extraction.

Table 8 Dimensions of the social representations of mining. PS, Colombia, 2013

Dimension / Stakeholder	Information of the representation			Field of the representation	Attitude towards mining	Common aspects
	Type	**Amount**	**Quality**			
Opinion leaders	Scientific Knowledge Secondary inf.	High Most information: - Negative environmental and social imp of gold mining.	- Incomplete - Updated	Companies/large-mining (45) the media (31) **water** (30) scientific knowledge (23) characteristics of PS (21) Government´s wrongdoing (19) risk of pollution (15) social organizations (10) Water of Bucaramanga (9)	**NEGATIVE** Emotional reaction - Fear - Mistrust - uncertainty	Dissemination of the information to reduce confusions
Mining companies	Scientific Knowledge Secondary inf.	High Most information: - Mining processes	- Incomplete -Updated - Privileged	Corporative Social responsibility and Sustainability (16) programs to community (12) **water** (11) misinformation/ignorance (10) mining history of PS (7) employment (6) national government (5)	**POSITIVE** - Attacked by the society (contamination of water) - uncertainty	
Traditional miners	Personal Experience	Medium Most information: - Traditional mining processes	- Incomplete Empty spots of SR completed with emotional assumptions	Large-scale mining (24) conflict/polarization (23) mining identity (21) mining title (21) employment (19) **water** (19) Traditional and s-scale mining (18) difficulties to develop s-scale mining (17) contamination (15)	**NEGATIVE** to large mining **POSITIVE** to small-scale mining - Emotional reaction has motivated the seeking of info. - Uncertainty - Mistrust - Resignation - Attacked by mining policy and by general society	
Authorities	Scientific Knowledge Secondary inf.	High Most information: - Mining legal regulations	- Complete - Updated	State´s wrongdoing (13) .- Humboldt line **water** (13) Regional Natural Park (11) large-scale mining (11) employment (8) mining identity (8) regional unpreparedness (8)	**POSITIVE** - uncertainty	
Common	Legitimation of group´s intensions/ interests through scientific and theoretical knowledge.			**WATER**		

CHAPTER 6 DISCUSSION

The lack of researches which address the mining case studies with the approach of the Social Representations Theory has been a constant problem. However, one remarkable qualitative research in this area was focused on the analysis of the women´s RS about the causes of mining environmental contamination in Cajamarca, Peru (Arana Z., 2005). One of the similarities between the Cajamarca´s study and this research concerns the intention of contributing to the resolution of conflicts; in this case, through the visibility of the subjective social reality of the mining phenomenon.

With regard to the differences, Arana focused on the SR of a single group of the population; whilst in this research a comparison between several groups was done. In addition, the perception of mining impacts is different between groups. For instance, women in Cajamarca perceived mining as sorrow, due to two main reasons: “loss” of health and death of people or animals, and water scarcity. On the other hand, each group of stakeholders in PS perceives mining differently and shared only one common feeling of uncertainty. This feeling is due to the future decisions that the government has to make and that will undoubtedly affect their ongoing situation.

Another qualitative study of SR was carried on rural area of Bogotá, Colombia (León Acosta, Vallejo Ovalle, Parra Carrasquilla, & Obregoso Rodríguez, 2010). The purpose was analyzing the SR of teachers of two schools about the environment in order to amend the school curriculum. The methodology used by this research was the Multiple Classification of Items which determines the collected data according to the frequency of appearance. Like the present research, the study concluded with a comparison of the SRs between the two teacher groups; only two common elements were shared: environment as nature and environment as livelihood.

The above shows the strong link between a group and its SR. The diversity of the SRs as a product of the different realities composed in turn by different functional knowledge (common sense). Therefore, the analysis and interpretation process that determines the content and structure of the cognitive system leads to the identification of very few common aspects that have to be mentioned together with the particular meanings that they have inside of each group.

Moreover, one similarity with the cited academic works was the theoretical foundation to address the SRT and environmental issues. Moscovici´s contributions as well as a fairly clear and complete compilation about this theory (Araya Umaña, 2002), have been referenced by those studies very often.

Furthermore, the classification of the SRs made by Marcos Reigota, cited by (Calixto Flores, 2008), has proven to be very helpful when defining the resulting SRs; they can be: naturalistic, universalizing and anthropocentric. According to Reigota, a naturalistic SR of environment focuses on the physical and chemical aspects and the flora and fauna; a universalizing SR of environment addresses the interactions between socio-natural aspects; and it is anthropocentric when it is focused on the use of the natural resources to fulfill the necessities of human beings. In light of this classification, the SRs of, in this case, the high mountain ecosystem by each stakeholder group can be identified mainly as *anthropocentric*, due to the personal interests they have in the ecosystem services (water, gold) of the páramo.

In addition, a study of 2011 (Rodríguez Salazar, 2011) highlighted the importance of the context when analyzing the SRs. It pointed out that the change and variety of meanings that a single element has for the same group is dependent on its particular interaction contexts. In that regard, the change of meaning inside a stakeholder group was not analyzed by the present study, but it recognized the dynamic character of the SRs when the comparison between the four stakeholder groups has been established.

Thus, the ongoing mining boom has been experienced by the stakeholders through the mining policies and regulations. Legal considerations are obstructing and confronting the common sense and the social world of each specific group and at the same time modifying their everyday life, up to the extent that they are constructing opposite social realities and reactions to defend their own view e.g. the informal mining developed by people who due to the strict mining regulations are extracting in land they do not own.

This case study shows some problems that Colombian legislation faces to implement its relatively new extractive model. The new mining regulation is posing a problem of compliance because

enterprises as well as authorities are ignoring the positions, opinions and ways of doing and being of the people where the mining operations take place. Especially because the mining legislation does not include the voices of all the stakeholders; instead of that, mining policy seems to privilege the multinationals, as the general data, presented in the chapter of background and in the description of the case study, showed.

CONCLUSIONS

Through this study the stakeholders of mining in PS were identified and selected; depending on their affectation grades by this large productive activity and the distance from the operations. The national, state and municipal scale presented a scenario composed by 16 social actors from which four relevant groups were studied: the opinion leaders, large-mining companies, traditional miners and members of the community of California, and environmental and municipal authorities. The formulation of development plans in PS and the decision making processes regarding mining (large and small-scale) must involve at least these groups and their opinions; therefore, the results of the present research are pertinent.

Besides, through this research the conceptual foundation of the social conflict and polarization has been made visible, showing that despite of some core elements are shared by the stakeholders´ representations, the meanings of these semantic constructions are completely different depending on the group and its particular context. Since the same concept has different meaning for each group, this implies an obligatory definition of concepts before any kind of decisions in this area involving the mining activity.

In regard to the above, the SRs of the four stakeholders are characterized by:

- They have a high amount of re-signified knowledge derived from a number of sources: the academy, the gold industry (related to the scientific knowledge) and personal experience.
- The representations of the stakeholders share some feelings that influence their attitudes´ orientation towards mining in PS, such as fear, mistrust, uncertainty and resignation. A negative

orientation of the attitude is motivated by the SRs of the opinion leaders and the Traditional Miners; while the attitude of the Multinationals and the Authorities has a positive orientation.
- This latter confirms that the analyzed representations are all immersed in an action framework and they act as guide to practice which in turn arises from the understanding and articulation of its particular social reality.

However, it is worth to clarify that the research was never intended to combine or integrate the SRs of mining in PS into a single SR. Instead of that, the study has produced links between the different dimensions and elements involved by mining activity in the PS. Undoubtedly, a deeper analysis of the SR and this socio-environmental phenomenon should include the remaining stakeholders. Future researches can be aimed to determine the updated environmental impacts of gold mining in PS, especially on water, and the SR of the local population about them. Likewise, a likely study about the SR of the HME-PS could also provide further inputs to the formulation of regional plans or environmental education strategies.

As a recommendation aimed to contribute to the reduction of the tense social situation, it can be highlighted the importance of recognizing the variety of understandings and contested discourses and therefore the necessity of valuing them in the same level. Respect, tolerance and equality should be *sine qua non* conditions for a reflexive interaction and a dialogical process to overcome the technicalities and the profitability and neoclassical utilitarian considerations of gold extraction in PS. This is related to the essence of the SRs inasmuch as they are ways to understand themselves and at the same time, are ways to understand the culture and the individual and group identity.

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Contact: paola.ordonez@gmail.com

ANNEXES

ANNEX 1. Documentary Source of Stakeholders

a) Stakeholders and their sources

	Actor	Source*
1	CDMB: Autonomous Regional Corporation for the Defense of the Bucaramanga Plateau	2, 3, 7, 14, 16, 18, 19, 31, 33, 32, 36, 37
2	Community of California & Traditional miners	3, 4, 6, 7, 14, 21, 28, 32, 36, 37
3	Environmental Licensing Unit	1, 5, 15, 24, 37
4	Government of the Department of Santander	2, 14, 37
5	Ingeominas	5, 7, 14, 15, 26, 30
6	Institute Alexander von Humboldt	1, 5, 6, 14
7	Large-mining companies	2, 3, 10,11, 13, 14 15, 24, 36, 37
8	Local Government of Bucaramanga	5, 14, 15, 20
9	Metropolitan Aqueduct of Bucaramanga	15, 19
10	Ministry of Environment	1, 2, 5, 8, 9, 14, 17, 31
11	Ministry of Mines and Energy	1, 5, 12, 9, 14, 24, 27
12	Municipal authorities	14, 32
13	Opinion leaders (MCDPS - PS Citizen Movement)	4, 14, 29, 36, 37
14	Local media	all sources
15	The Media (press, radio, television)	all sources
16	Workers and miners of the companies	4, 14, 28
	* The numbers refer to the list below	

b) List of documentary sources of all stakeholders of mining in PS

1	Bejarano, R. (2013). No hay que olvidar que después de la tempestad llega la calma. La esperanza de un país. *Revista Semana*. Retrieved from http://www.semana.com/cartas/articulo/cartas/335191-3
2	Bucaramanga. (2013a). Eco Oro afirma que seguirá con proyecto de explotación en Santurbán. *El Tiempo*. Colombia. Retrieved from http://www.eltiempo.com/archivo/documento/CMS-12527549
3	Bucaramanga. (2013b). El Parque Nacional Regional Páramo de Santurbán tiene imagen propia. *El Tiempo*. Colombia. Retrieved from http://www.eltiempo.com/archivo/documento/CMS-12724048
4	Bucaramanga. (2013c). Marchas a favor y en contra de la minería en el páramo de Santurbán. *El Tiempo*. Colombia. Retrieved from http://www.eltiempo.com/archivo/documento/CMS-12689005
5	Castellanos, C. M. (2011). El concepto ténico del MDVDT evidencia la insustentabilidad del proyecto Angostura. Equipo Nizkor, Derechos Human Rights. Retrieved from http://www.derechos.org/nizkor/colombia/doc/ccalcp7.html
6	Castrillón, G. (2011). Santurbán un paraíso que vale oro. *Instituto de Investigación de Recursos Biológicos, Alexander von Humboldt, Colombia*. Retrieved from http://www.humboldt.org.co/iavh/component/k2/item/275-santurbán-un-para%C3%ADso-que-vale-oro
7	Celedón, N. (2012). En 2013, AUX solicitará licencia ambiental para explotación de oro. *Revista Vanguardia*. Retrieved from http://www.vanguardia.com/economia/local/186676-en-2013-aux-solicitara-licencia-ambiental-para-explotacion-de-oro
8	Chacón González, J. (2013). El desafío minero. *El Espectador*. Colombia. Retrieved from http://www.elespectador.com/noticias/economia/articulo-397680-el-desafio-minero
9	Codechoco. (2013). Oro y crimen: minería ilegal. *Revista Semana*. Retrieved from http://www.semana.com/nacion/articulo/oro-crimen-mineria-ilegal/338107-3
10	ElEspectador.com. (2013a). Boquete jurídico beneficiaría a multinacionales mineras en Colombia. *El Espectador*. Colombia.
11	ElEspectador.com. (2013b). Así está el mapa minero del país. *El Espectador*. Colombia. Retrieved from http://www.elespectador.com/noticias/infografia/articulo-414719-asi-esta-el-mapa-minero-del-pais
12	ElEspectador.com. (2013c). Se lucha contra minería criminal y no contra mineros artesanales: Santos. *El Espectador*. Colombia. Retrieved from http://www.elespectador.com/noticias/nacional/articulo-414302-se-lucha-contra-mineria-criminal-y-no-contra-mineros-artesanales
13	Greystar Resources Ltd, 2009. *"Términos de Referencia para el Estudio de Impacto Ambiental para Explotación a Cielo Abierto de Minerales Auroargentíferos - Consesión Minera para la Explotación de Minerales Auroargentíferos en los Municipios de Californnia (Santander)*. Bogotá: Greystar Resources Ltd.
14	Hurtado Sabogal, R. (2011). *La Contienda Política Alrededor de la Licencia Ambiental para el Proyecto Minero Angosturas en el Páramo de Santurbán.* Bogotá: Pontificia Universidad Javeriana.
15	Insuasty Rodríguez, A. (2011). Páramo de Santurbán y el Proyecto Angosturas. Retrieved from http://www.usbmed.edu.co/Noticias/Lists/Entradas%20de%20blog/Post.aspx?ID=1163

16	Londoño Calle, V. (2013a). El enredo de los títulos de Santurbán. *El Espectador*. Colombia. Retrieved from http://www.elespectador.com/noticias/cultura/vivir/articulo-397447-el-enredo-de-los-titulos-de-santurban
17	Londoño Calle, V. (2013b). Parques naturales, un dilema entre la protección y la minería.
18	Londoño Calle, V. (2013c). Santurbán, un parque rodeado de minas. *El Espectador*. Colombia. Retrieved from http://www.elespectador.com/noticias/actualidad/vivir/articulo-396991-santurban-un-parque-rodeado-de-minas
19	Maya, G. (2013). Santurbán: a merced de la gran minería. *El Tiempo*. Colombia. Retrieved from http://www.eltiempo.com/archivo/documento/CMS-12554734
20	Municipio de Santander. (2012). California "Por California la Unidad." *Sitio oficial de California en Santander, Colombia*. Retrieved from http://www.california-santander.gov.co/nuestromunicipio.shtml?apc=mfxx1-&m=f
21	Paternina, L. (2011a). El proyecto de oro Angostura, Colombia. Retrieved from http://www.lingoro.info/tag/colombia/
22	Paternina, L. (2011b). Oro en Colombia: minas de la Colosa y Marmato. Retrieved from http://www.lingoro.info/tag/colombia/
23	Paternina, L. (2011c). Oro verde: una inversión por la paz y la biodiversidad en Colombia. Retrieved from http://www.lingoro.info/tag/colombia/
24	Reuters. (2013). Empresas con licencia, únicas con permiso para explotar en Santurbán. *El Tiempo*. Colombia. Retrieved from http://www.eltiempo.com/archivo/documento/CMS-12527045
25	Revista Semana. (2011a). Fiebre de oro. *Revista Semana*. Retrieved from http://www.semana.com/nacion/articulo/la-olla-podrida-ingeominas/240874-3
26	Revista Semana. (2011b). La olla podrida de ingeominas. *Revista Semana*. Retrieved from http://www.semana.com/nacion/articulo/la-olla-podrida-ingeominas/240874-3
27	Revista Semana. (2013a). Código minero va en reversa. *Revista Semana*. Retrieved from http://www.semana.com/nacion/articulo/codigo-minero-va-reversa/333595-3
28	Revista Semana. (2013b). La insólita protesta de los mineros de Santurbán. *Revista Semana*. Retrieved from http://www.semana.com/nacion/articulo/la-insolita-protesta-mineros-santurban/331256-3
29	Rodriguez-Salah, E. (2013). Y todos salimos a marchar por el agua y por la dignidad. El Frente. Retrieved from http://www.elfrente.com.co/index.php/opiniones/columnistas/item/16695-¡y-todos-salimos-a-marchar-por-el-agua-y-por-la-dignidad
30	Vélez, M. E. (2011). Feria de títulos mineros. *Poder 360*. Retrieved from http://www.poder360.com/article_detail.php?id_article=5482
31	Virviescas Gómez, P. (2011). Milagro: nació el Parque Santurbán. *CROMOS*. Retrieved from http://www.cromos.com.co/personajes/actualidad/articulo-140805-santurban-un-paraiso-vale-oro
32	Virviescas Gómez, P. (2013). El alcalde que le tumbó una reja a una multinacional minera. *El Espectador*. Colombia. http://www.elespectador.com/noticias/medio-ambiente/articulo-396993-el-alcalde-le-tumbo-una-reja-una-multinacional-minera
33	Zuluaga, C. (2013a). Locomotora minera está mal concebida. *El Espectador*. Colombia. Retrieved from http://www.elespectador.com/noticias/nacional/articulo-396605-locomotora-minera-esta-mal-concebida
34	Zuluaga, C. (2013b). No se puede establecer cuánto se explota. *El Espectador*. Colombia. http://www.elespectador.com/noticias/economia/articulo-416338-no-se-puede-establecer-cuanto-se-explota

	TELEVISION SPECIALS
35	National Television Channel RCN, 2013. *Historia de la Violencia en Soto Norte,* Bogotá: http://www.youtube.com/watch?v=WvCNzOiJ1Yo.
36	Newscast CM&, 2013. *Crónicas de Mauricio Gómez. Santurbán ¿Se salva o no?,* Bogotá: Bejarano, R. (2013). No hay que olvidar que después de la tempestad llega la calma. La esperanza de un país. Revista Semana. Retrieved from http://www.semana.com/cartas/articulo/cartas/335191-3.
37	Regional Television Channel TRO, 2013. *Debate de Minería en Santander,* Bucaramanga: http://www.youtube.com/watch?v=fTRO2liINt0&feature=youtu.be.
38	Regional Television Channel TRO, 2013. *Historia de la Minería en Soto Norte,* Bucaramanga: http://www.youtube.com/watch?v=E-HeNCeKSLk.

ANNEX 2. Codes of the Stakeholders Analysis

CODES RESULTING FROM THE ANALYSIS			
OPINION LEADERS	**MINING COMPANIES**	**TRADITIONAL MINERS**	**AUTHORITIES**
OL Alternative Proposals	MC acid water	TM Alternative prop - Reactions	AU Necessity of dialog
OL Angostura project	MC agricultural sit	TM Alternative proposals	AU Angosturas project
OL Cal Agricultural sit	MC Alternative proposals	TM Angostura Mining Proj	AU Changing of traditions
OL Cal Identity mining	MC Angostura Mining Proj	TM AUX	AU Code of mines
OL Characteristics of PS	MC Cal identity mining	TM Cal deficient social services	AU conflicts/polarization
OL Code of Mines	MC Cases in Colombia	TM Cal familiar changes	AU cooperation project Suratá
OL Colombia examples or data	MC Comp Study of Env	TM Cal Higher prices	river
OL Comp AUX	Impact	TM Cal Identity - mining	AU Corp Soc Responsibility
OL Companies/ Large-s mining	MC conflicts with	TM Cal Land tenure	AU decisions of NAT Gov
OL Conflict/polarization	community	TM Cal Migration	AU Dependency on mining
OL Demands on the State	MC Corp soc resp and	TM Changing Traditions	AU Difficulties of s-s mining
OL Ecooro/greystar	sustainability	TM Code of mines	AU Employment
OL Employment	MC Cyanide and other	TM Companies Social	AU env impacts of mining
OL Env License of Ang proj	chemical	responsibility	AU exclusion of locals opinion
OL Environmental impacts of	MC economic interests	TM Conflict/ polarization	AU FARC
mining	MC Employment	TM Contamination	AU floating population
OL Fight	MC Humboldt line	TM Cooperation BGR río Suratá	AU Greystar Ecooro
OL Government´s Wrongdoing	MC inefficiency of	TM Corruption	AU Health problems by mining
OL health problems by mining	government	TM Cyanide and other chemicals	AU Humboldt line
OL High value of Páramos	MC investment resources	TM Defense of Territory	AU Inhabitants Soto
OL Humboldt line	MC large-s mining	TM deforestation	AU Regional unpreparedness
OL In- Security and public force	MC marches	TM Difficulties to develop s-s	AU large-s mining in PS
OL Inhabitants California and	MC Mining- illegal	mining	AU migration
Vetas	MC mining history of PS	TM Eco Oro/Greystar	AU Mining history
OL International mining cases	MC Mining Laws	TM Economic Interests	AU Mining Identity
OL Marketing concept	MC	TM Education	AU mining illegal
OL Miners pro large scale	Misinformation/ignorance	TM Employment	AU Mining titles
mining	MC Natural regional park	TM Gold-profitability	AU mining titles sold to
OL Mining in PS history	PS	TM Guerrilla	Companies
OL Mining Taxes - Royalties	MC Páramo Santurbán	TM illegal mining	AU páramo de Santurbán
OL Mistrust in Companies	MC Programs to	TM inefficiency of government	AU political interests
promises	community	TM Interests - political	AU profitability and investment
OL inhabitants of BGA	MC relation with	TM Large-s mining	AU programs of companies to
OL Poll Cyanide and chemicals	community	TM Mining title	community
OL Pollution Risks	MC Relations National Gov	TM Misinformation/ignorance	AU reaction to the alternatives
OL PS Regional natural park	MC relations with	TM Páramo sant	AU Regional natural Park
OL relation BGA env.	authorities	TM Personal experience	AU relations CDMB with local
authorities	MC relations with soc org	TM personal interests	authorities
OL Relations Nat Government	BGA	TM Personal opinion	AU Relations mining comp-
OL scientific knowledge	MC Royalties	TM Programs to community	community
OL Social Licence	MC security and public	TM PS Humboldt line	AU relations mining companies
OL Committee PS	force	TM Regional Nat Park PS	AU relations with comm BGA
OL Soc Organizations	MC Technology	TM relations CDMB	AU relations with community
OL Sust development	MC The Media	TM Relations municipal admon	AU Role of the academy
OL The marches	MC traditional mining	TM relations with social org BGA	AU Role of the CDMB
OL The media	MC Water	TM Resignation	AU Royalties to the region
OL Traditional mining	MC Water of BGA	TM Royalties	AU State´s wrongdoing
OL Underground mining		TM security	AU technology of L-s mining
OL Water		TM Social impacts of mining	AU technology s-s mining
OL Water of Bga		TM Social organizations	AU The media
OL Water/rain Acid		TM Technology	AU Water
		TM The Media	
		TM Traditional/small mining	
		TM Water	
		TM Water of BGA	
46 Codes	**35 Codes**	**53 Codes**	**46 Codes**

Total: 180 Codes

ANNEX 3. Number of Quotations of Interviews associated to Codes

CODES-PRIMARY-DOCUMENTS-TABLE (CELL=Q-FREQ)

Report created by Super - 12/07/2013 12:43:35 a.m.

"HU: [C:\Users\user\Documents\MAESTRIA\ENREM Köln mexi...\SOCIAL REPRESENTATIONS MINING PS.hpr6]"

Code-Filter: All [188]

PD-Filter: All [22]

Quotation-Filter: All [1121]

	PRIMARY DOCS - Analyzed interviews																						
CODES	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**Totals**
AU Angosturas projec	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
AU Changing of tradi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
AU Code of mines	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3
AU conflicts/polariz	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0	4
AU cooperation proje	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
AU Corp Soc Responsi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	2
AU decisions of NAT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	2
AU Dependency on min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
AU Difficulties of s	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	4
AU Employment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	2	1	0	8
AU env impacts of mi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	3
AU exclusion of loca	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	5
AU FARC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3
AU floating populati	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2
AU Greystar Ecooro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	3
AU Health problems b	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	3
AU Humboldt line	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5	0	10
AU Inhabitants Soto	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	4	0	0	6
AU large-s mining in	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	0	0	3	0	11
AU migration	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	0	0	0	4
AU Mining history	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	1	0	1	5
AU Mining Identity	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	0	0	8
AU mining illegal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3
AU MINING IN PS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AU Mining titles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	4	0	0	6
AU mining titles sol	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2
AU Neccesity of dial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	1	3	0	9
AU páramo de Santurb	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	7	1	10
AU political interes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2
AU profitability and	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	0	0	3
AU programs of compa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3
AU reaction to the a	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	4	0	0	7
AU Regional natural	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0	3	2	2	11
AU regional unprepar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	6	1	0	8
AU relations CDMB wi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2
AU Relations mining	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
AU relations mining	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	3
AU relations with co	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	2	0	5

AU relations with co	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0	0	0	5
AU Role of the acade	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
AU Role of the CDMB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	1	6
AU Royalties to the	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	0	3
AU State´s wrongdoin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	7	3	0	13
AU technology of L-s	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	5
AU technology s-s mi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	2	0	5
AU The media	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	1	0	4
AU Water	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	0	7	1	13
Authorities	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MC acid water	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	0	0	0	4
MC agricultural sit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
MC Angostura Mining	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	0	0	0	0	4
MC Cases in Colombia	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	0	0	6
MC conflicts with co	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
MC Corp soc resp and	0	0	0	0	0	0	0	0	0	0	0	0	0	3	13	0	0	0	0	0	0	0	16
MC Current mining in	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	4
MC Cyanide and other	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2
MC economic interest	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
MC EIA	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	0	0	0	4
MC Employment	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2	1	0	0	0	0	0	0	6
MC Future programs	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	4
MC Humboldt line	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0	0	0	0	0	0	0	4
MC inefficiency of g	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	3
MC investment resouc	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	4
MC large-s mining	0	0	0	0	0	0	0	0	0	0	0	0	0	2	9	0	0	0	0	0	0	0	11
MC marches	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	4
MC Mining- illegal	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	5
MC mining history of	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	2	0	0	0	0	0	0	7
MC Mining identity	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	3
MC MINING IN PS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MC Mining Laws	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
MC Misinformation/ig	0	0	0	0	0	0	0	0	0	0	0	0	0	3	7	0	0	0	0	0	0	0	10
MC National Gov	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2	0	0	0	0	0	0	0	5
MC Natural regional	0	0	0	0	0	0	0	0	0	0	0	0	0	3	5	0	0	0	0	0	0	0	8
MC Programs to commu	0	0	0	0	0	0	0	0	0	0	0	0	0	5	4	3	0	0	0	0	0	0	12
MC relation with com	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	1	0	0	0	0	0	0	5
MC relations with au	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	3
MC relations with so	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
MC Royalties	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	0	0	0	0	0	0	0	5
MC security and publ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	4
MC Technology	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	2
MC The Media	0	0	0	0	0	0	0	0	0	0	0	0	0	2	4	0	0	0	0	0	0	0	6
MC traditional minin	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	0	0	6
MC Water	0	0	0	0	0	0	0	0	0	0	0	0	0	2	9	0	0	0	0	0	0	0	11
MC Water of BGA	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2
Mining Companies	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MINING IN PS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OL Alternative Propo	0	0	0	0	6	2	4	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	14
OL Angostura project	11	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13
OL Cal Agricultural	0	0	2	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
OL Cal Identity mini	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
OL Characteristics o	7	2	1	3	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21
OL Code of Mines	0	0	3	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7

OL Colombia examples	0	0	0	1	4	1	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12
OL Committee PS	2	1	0	0	0	3	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
OL Comp AUX	0	0	2	1	3	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
OL Companies/ Large-	6	6	7	7	5	9	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45
OL Conflict/polariza	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
OL Demands on the St	0	4	0	0	2	0	5	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12
OL Ecooro/greystar	7	1	1	3	2	2	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
OL Employment	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
OL Env License of An	0	4	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
OL Environmental imp	0	0	2	4	3	1	4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
OL Fight	9	3	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14
OL Government´s Wron	0	0	5	3	2	6	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19
OL health problems b	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
OL High value of Pár	0	7	3	0	4	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18
OL Humboldt line	0	1	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
OL In- Security and	0	0	1	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
OL inhabitants of BG	0	1	4	1	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
OL Inhabitants Soto	0	0	1	1	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
OL International min	0	0	1	1	6	3	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
OL Marketing concept	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
OL Miners pro large	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
OL Mining in PS hist	0	0	0	1	2	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
OL Mining Taxes - Ro	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
OL Mistrust in Compa	0	0	0	1	1	3	6	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12
OL Poll Cyanide and	0	0	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
OL Pollution Risks	1	3	3	5	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
OL PS Regional natur	0	3	2	5	2	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20
OL relation BGA env	1	0	0	1	0	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
OL Relations Nat Gov	10	1	0	4	3	2	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40
OL scientific knowle	0	2	5	2	6	4	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23
OL Soc Organizations	2	1	1	1	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
OL Social Licence	0	1	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
OL Sust development	2	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
OL The marches	11	6	3	0	5	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27
OL The media	16	9	2	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31
OL Traditional minin	2	1	4	3	3	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
OL Underground minin	0	0	0	0	7	3	2	1	1	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	16
OL Water	4	3	8	5	6	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30
OL Water of Bga	1	0	2	1	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
OL Water/rain Acid	0	0	0	1	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
Opinion Leaders	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TM Alternative prop	0	0	0	0	0	0	0	0	1	3	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	7
TM Alternative propo	0	0	0	0	0	0	0	0	0	2	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	6
TM Angostura Mining	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
TM AUX	0	0	0	0	0	0	0	0	2	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	7
TM Cal defficient so	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	3
TM Cal familiar chan	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
TM Cal Higher prices	0	0	0	0	0	0	0	0	1	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	5
TM Cal Identity - mi	0	0	0	0	0	0	0	0	5	5	5	2	4	0	0	0	0	0	0	0	0	0	0	0	0	21
TM Cal Land tenure	0	0	0	0	0	0	0	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	4
TM Cal Migration	0	0	0	0	0	0	0	2	2	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	7
TM Changing Traditio	0	0	0	0	0	0	0	3	1	0	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	10
TM Code of mines	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
TM Companies Social	0	0	0	0	0	0	0	0	0	0	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	5

TM Conflict/ polariz	0	0	0	0	0	0	0	0	6	5	1	11	0	0	0	0	0	0	0	0	0	0	23
TM Contamination	0	0	0	0	0	0	0	4	6	0	2	3	0	0	0	0	0	0	0	0	0	0	15
TM Cooperation BGR r	0	0	0	0	0	0	0	0	0	5	0	0	0	1	0	0	0	0	0	0	0	0	6
TM Corruption	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4
TM Cyanide and other	0	0	0	0	0	0	0	0	4	2	1	0	2	0	0	0	0	0	0	0	0	0	9
TM Defense of Territ	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
TM deforestation	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
TM Difficulties to d	0	0	0	0	0	0	0	0	2	9	0	2	4	0	0	0	0	0	0	0	0	0	17
TM Eco Oro/Greystar	0	0	0	0	0	0	0	0	3	0	1	4	0	0	0	0	0	0	0	0	0	0	8
TM Economic Interest	0	0	0	0	0	0	0	0	0	0	4	4	6	0	0	0	0	0	0	0	0	0	14
TM Education	0	0	0	0	0	0	0	1	0	0	4	2	0	1	0	0	0	0	0	0	0	0	8
TM Employment	0	0	0	0	0	0	0	0	4	2	1	11	1	0	0	0	0	0	0	0	0	0	19
TM expectations futu	0	0	0	0	0	0	0	0	2	6	4	5	3	1	3	0	0	0	0	0	0	0	24
TM Gold-profitabilit	0	0	0	0	0	0	0	0	3	0	0	0	4	0	0	0	0	0	0	0	0	0	7
TM Guerrilla	0	0	0	0	0	0	0	0	2	1	0	0	0	1	0	0	0	0	0	0	0	0	4
TM illegal mining	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	4
TM inefficiency og g	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	3
TM Interests - polit	0	0	0	0	0	0	0	0	0	5	4	1	0	1	2	0	0	0	0	0	0	0	13
TM Large-s mining	0	0	0	0	0	0	0	3	4	0	5	3	9	0	0	0	0	0	0	0	0	0	24
TM MINING IN PS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TM Mining title	0	0	0	0	0	0	0	0	5	5	0	5	3	1	0	2	0	0	0	0	0	0	21
TM Minsinformation/i	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	5
TM Páramo sant	0	0	0	0	0	0	0	2	1	1	1	0	2	0	0	0	0	0	0	0	0	0	7
TM Personal experien	0	0	0	0	0	0	0	0	2	1	2	1	3	0	0	0	0	0	0	0	0	0	9
TM personal interest	0	0	0	0	0	0	0	1	0	0	3	3	0	0	0	0	0	0	0	0	0	0	7
TM Programs to commu	0	0	0	0	0	0	0	0	0	0	9	4	0	0	0	0	0	0	0	0	0	0	13
TM PS Humboldt line	0	0	0	0	0	0	0	0	0	5	0	1	0	0	0	0	0	0	0	0	0	0	6
TM Regional Nat Park	0	0	0	0	0	0	0	0	0	4	0	2	1	0	0	0	0	0	0	0	0	0	7
TM relations CDMB	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2
TM Relations municip	0	0	0	0	0	0	0	0	1	0	3	7	1	0	0	0	0	0	0	0	0	0	12
TM relations with so	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
TM Resignation	0	0	0	0	0	0	0	1	0	0	0	5	7	0	0	0	0	0	0	0	0	0	13
TM Royalties	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	3
TM security	0	0	0	0	0	0	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	4
TM Social impacts of	0	0	0	0	0	0	0	2	0	0	1	2	0	0	0	0	0	0	0	0	0	0	5
TM Social organizati	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
TM Technology	0	0	0	0	0	0	0	0	1	2	0	0	3	0	0	0	0	0	0	0	0	0	6
TM The Media	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	3
TM Traditional/small	0	0	0	0	0	0	0	1	5	4	3	2	3	0	0	0	0	0	0	0	0	0	18
TM Water	0	0	0	0	0	0	0	1	5	3	2	7	1	0	0	0	0	0	0	0	0	0	19
TM Water of BGA	0	0	0	0	0	0	0	0	0	0	0	4	2	0	0	0	0	0	0	0	0	0	6
Traditional miners	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	95	65	65	68	105	72	116	23	82	100	67	109	71	78	98	15	36	39	17	70	53	7	**1451**