



A Foretold Environmental Catastrophe

The case of small-scale and artisanal mining in Madre de Dios

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Acknowledgment

Well, here's your box. Nearly everything I have is in it, and it is not full. Pain and excitement are in it, and feeling good or bad and evil thoughts and good thoughts- the pleasure of design and some despair and the indescribable joy of creation.

And on top of these are all the gratitude and love I have for you.

And still the box is not full.

- John Steinbeck

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List of Acronyms

ACCA	Asociación para la Conservación de la Cuenca Amazónica (Association for the Conservation of the Amazon Basin)
CRS	Catholic Relief Service
FADEMAD	Federación Agraria Departmental de Madre de Dios (Departmental Agrarian Federation of Madre de Dios)
FEDEMIN	Federación Minera de Madre de Dios (Mining Federation of Madre de Dios)
FTA	Free Trade Agreement
GDP	Gross Domestic Product
GOREMAD	Gobierno Regional de Madre de Dios (Regional Government of Madre de Dios)
ILO	International Labor Organization
INEI	Instituto Nacional de Estadística e Informática (National Institute of Statistics and Informatics)
MINAM	Ministerio del Ambiente (Ministry of Environment)
OEFA	Organismo de Evaluación y Fiscalización Ambiental (Agency for Assessment and Environmental Control)
PNAS	Proceedings of the National Academy of Sciences of the United States of America
REDD+	Reducing emissions from deforestation and forest degradation
SPDA	Sociedad Peruana de Derecho Ambiental (Peruvian Society for Environmental Law)

Abstract

This paper problematizes the role of informal mining in the environmental depletion of Madre de Dios through the analysis of the institutional dynamics that shape the miners actions. It answers the question of how the State's behaviour influences the causal relationship between small-scale and artisanal mining and environmental depletion. By using an analytical framework built from the theoretical debates about the structural approach of informal economy and natural resource-led development, three concepts such as institutional change, informalization and conflicts are identified to interpret the dynamics that led to the deforestation and loss of biodiversity in the region. Under these analytical considerations, qualitative research techniques were employed in order to find the connectivity among the three concepts within the public sector's actions. Thereby, the findings of the research conclude that there is a historical causal relationship between the role of the State and the harmful behaviour of small-scale and artisanal gold miners regarding the environment. In this sense, regulations have sought to ensure the sustainability of a natural resource-led development model under the competitive dynamics of the market economy.

Relevance to Development Studies

The research sought to capture the interdisciplinary perspective of development studies to analyse a complex scenario in a holistic manner. Being focused on thoughtful analysis of the different social, economic and political dimensions of environmental phenomena, the focus was to problematize and mutually enrich both theoretical debates and methodological approaches. This convergence of approaches allowed to avoid a biased argumentative perspective and helped to conduct the research under a working framework that took into account the historical, cultural and social complexity of the phenomenon analysed. Thereby, the findings presented in the paper are relevant at both theoretical and empirical levels.

At the theoretical level, the research added valuable insights to the debates about the natural resource-led developmental path, mainly followed by developing countries. Through the analysis of the interrelation between State, informal mining and emergence of environmental conflicts, the paper delves into an area of study that demands dynamic academic research. Meanwhile, at the empirical level the comprehensive perspective employed to analyse the research problem is a contribution to the understanding of environmental problems for the development of policy alternatives. Thus, the research highlights the importance of the academic research in development studies.

Keywords

Environmental depletion, informal economy, mining, natural resource-led development, market economy, State.

Chapter 1

When the blessing becomes a curse

1.1. Introduction

Peru is a beggar, sitting on a bench of gold.

- Antonio Raimondi

Peru has been characterized throughout its history as one of the countries with the highest gold mineral reserves in the world (Contreras and Cueto 2007). Since colonial times, according to Spanish historian Gonzalo Fernandez de Oviedo, the Peruvian territory was considered the home of 'El Dorado', a lost city in South America where gold abounded (Becco 2003). That myth emerged among the Spanish conquerors and would be one of the biggest drivers behind their expansion into the American continent. This belief was strong enough that the conquerors believed that by going from the Pacific coast across the Andes, hidden in the Peruvian Amazon would be a secret city built entirely of gold (Becco 2003). What the conquerors did not take into account was that the coordinates mentioned in several versions of the story match the location of Madre de Dios, which is currently known as the region of Peru that counts with the largest population of small-scale and artisanal gold miners.

This paper questions the causal relationship between small-scale and artisanal gold mining and environmental depletion established by the State to address environmental conflicts in Madre de Dios. By contrasting the historical behaviour of the State regarding the promotion of extractive activities with the main theoretical debates about informal economies and development and mining, the research provides a new perspective for understanding the causes of environmental problems. In this sense, the analysis of the primary and secondary data employs three concepts such as institutional change, informalization and conflicts to interpret the dynamics that led to the deforestation and loss of biodiversity in the region. Thereby, the findings of the research indicate that the environmental depletion caused by small-scale and artisanal gold mining was promoted for decades by the Peruvian State through regulations that sought to ensure the sustainability of a natural resource-led development model under the competitive dynamics of the market economy.

Chapter 1 of the research paper develops an overview of the environmental setting in Madre de Dios. Here, the main question, research problem as well as the methodology are presented. Emphasis is placed on the development of an analytical framework from two theoretical approaches. The latter is constructed in Chapter 2 through the analysis of the structuralist theory of the informal economy and the debates surrounding the relationship between mining and development, which also leads to the construction of research's sub-questions. Furthermore, Chapters 3 and 4 focus on the analysis of the data collected in the revision of secondary documents and in the fieldwork. Finally in Chapter 5 and the Conclusions both the secondary and primary data are contrasted in order to provide a holistic answer to the main research question.

1.2. Gold Mining and Madre de Dios

Peru's economic growth has always gone hand in hand with the development of extractive industries. Among them, mining is the activity that has gained greater prominence not only for its representativeness in the national GDP, but also because it is an economic activity that has been present in the country throughout its history. Since the beginning of the 1970s, a gold rush has attracted thousands of miners to the Peruvian Amazon causing negative impacts on one of the most complex and biodiverse ecosystems in the world. It is currently estimated that there are about 300 000 to 400 000 miners along the Amazon basin, of which over 30,000 are working in Madre de Dios (Deza Arroyo 1996). The latter, known as the most biodiverse region of the country, has a huge variety of animal and vegetal species that live in the approximately 85,183 square kilometres of tropical forest that represent the 6.6% of the national territory (Álvarez et al. 2011). It is these characteristics that led UNESCO to declare the Manu National Park (one of the three protected areas in the region along with Bahuaja -Sonene and Tambopata National Reserve) a world natural heritage site in 1987 (Levi et al. 2009). Moreover, the Peruvian State recognized the importance of the biodiversity of the region in 1994 when declaring Madre de Dios the 'capital of biodiversity of Peru' (Congreso de la República, República del Perú 1994).

However, in spite the strategic importance of the region for the country, its history has been tied to contradictory scenarios that threaten the conservation of its flora and fauna. Since the late nineteenth and throughout the twentieth century Madre de Dios has been synonymous to extractive economic activities such as rubber, gold, chestnuts and logging (Mosquera C. et al. 2009). The development of such activities not only led to environmental depletion, but also dramatically impacted in the livelihoods of indigenous communities in the region (Pachas 2010). Nonetheless, even though a high percentage of miners in Madre de Dios are migrants from other regions of the country, mainly from the Andes, in recent years there are also indigenous communities involved in the activity (Pachas 2010). Hence, since the middle of the last century the economic activity that contributes most significantly to regional GDP is gold mining. According to figures from the National Institute of Statistics and Informatics (INEI) over the past two decades, the economic contribution of mining to the development of the region has increased considerably to the point of exceeding half of the region's GDP in recent years (Vuohelainen et al. 2012). This is due largely to increases in gold demand and the consequent impact in its pricing (Álvarez et al. 2011).

Given the importance of gold mining for the development of Madre de Dios, this economic activity has become the primary cause of economic growth and environmental degradation in the region. According to the Proceedings of the National Academy of Sciences of the United States of America (PNAS) between 1999 and 2012 the geographical extent of gold mining in Madre de Dios has increased by 400% (Asner et al. 2013). Even more, it is considered that because of the increase in gold prices since 2008 the average annual deforestation in the region has tripled (Asner et al. 2013). This environmental damage has been occasioned by small-scale and artisanal miners, mainly because of the use of heavy and sophisticated machinery to increase the amount of mineral extracted. The inexistence of large and medium-scale

mining operations in the area reaffirms that the environmental problems come from small-scale extractive activities (Álvarez et al. 2011). In this sense, taking into account that the negative impacts of gold mining over the biodiversity of the region are growing rapidly, the State has changed its priorities regarding the development of the Madre de Dios region. Thus, in 2010 the public sector enacted a regulatory framework with the purpose of addressing the environmental problems through policies which required the formalization of small-scale and artisanal mining (Poder Ejecutivo, República del Perú 2010). These policies were mainly focused on controlling the issuance of mining concessions, the protection of natural reserves and the reduction of mercury pollution.

Under the regulatory parameters established in 2010, 99% of mining operations in the region are considered informal, not only due to its role in the destruction of more than 50 000 hectares of forest, but also for the contamination of rivers with mercury and other chemicals (Álvarez et al. 2011). Recent studies (Webb et al. 2004) reported that in the last 20 years more than 3000 tons of mercury and other chemicals have been dumped into the Amazonian rivers, polluting the water, aquatic organisms and human populations that depend on water resources. This is owing to the large amount of gold that is removed in Madre de Dios, which approximately goes from 16 000 to 18 000 kg of gold per year, an alarming situation considering that for every kg of gold extracted about 2.8 kg of mercury is needed (Álvarez et al. 2011). In this sense, mining in Madre de Dios represents around 9% of the gold production from the country. Consequently, this may lead us to consider that the negative effects of gold mining are not only local, but spread across several geographical areas of Peruvian Amazon since the contaminants are washed away and the contaminated animals migrate along watercourses.

In general, according to the Ministry of Environment (Álvarez et al. 2011) the ravages of gold mining in Madre de Dios have spread along the environmental, economic, social and political spheres of the region. At the environmental level, poisoning by heavy metals, especially mercury, and deforestation have caused not only the loss of important nature reserves, but have also altered the stability of the forest ecosystems. From an economic and social perspective, tax evasion and the high rate of migration, complemented by an inefficient provision of public services, have led to an increase in the number of human settlements in protected areas as well as labour exploitation and disease proliferation. Also, at the political level, public institutions have lost legitimacy, thus completing a vicious cycle that hampers the success of public policies developed to monitor mining activities in the region. Therefore, environmental degradation in Madre de Dios has become the tip of the iceberg in a series of problems that go beyond the loss of biodiversity to a situation that brings into question the role the State has played in the area throughout the history.

1.3. Research Problem and Methodology

By deepening in the analysis of the current environmental scenario of Madre de Dios, the need to understand the causes that led to the harmful behaviour of small-scale and artisanal miners regarding the environment arises. In this sense, throughout the evolution of gold mining in the region there has been a long absence of the State to regulate the environmental impacts of such

extractive activity. To this end, the research problem is the influence of the State's behaviour in the causal relationship between small-scale and artisanal mining and environmental depletion in Madre de Dios. This problem will be analysed from a holistic perspective through the following research question:

- How does the State's behavior influence the causal relationship between small-scale and artisanal mining and environmental depletion in Madre de Dios?

Moreover, given the complexity and the spatial dimension of the case of mining in Madre de Dios, the research is conducted under a case study approach. Specifically, the methodological design of the research can be considered a single holistic case study with a single unit of analysis (Yin 2009). This methodological tool not only allowed the problem to be addressed from different data collection techniques but also helped to keep the focus of the research in answering the 'how' and 'why' of the problem, through the use of multiple sources and data (Yin 2009). Furthermore, the case study approach provided the opportunity of developing an intense and comprehensive analysis of the research problem based in the observation, which gave access to a wealth of detailed data that may not necessarily have been gathered through the other methods (Gerring 2004).

Under these methodological considerations, techniques for collecting qualitative data were used such as semi-structured interviews, direct observation, and review of secondary documents. The latter consisted on the gathering of the existing literature related to the topic, as well as the analysis of the regulatory framework of small-scale and artisanal mining enacted by the Peruvian State; while the interviews and observations were conducted as part of the fieldwork (Kvale and Brinkmann 2008). Even though the use of the mentioned qualitative techniques was prone to suffer from risks and ethical challenges, these were mitigated through the selection of official spokespersons for each target group to be interviewed. Thus, the semi-structured interviews were conducted with the base of a stakeholder analysis of mining that helped to identify key actors in the public and private sector as well as from the civil society. In this regard, the selection of stakeholders was made using the information collected from the secondary data analysis as a reference. Thereby, the utilization of different research techniques was supported by a stakeholder mapping in order to ensure the reliability of the research outcomes.

Furthermore, as part of the methodological strategy a literature review of the main theoretical trends related to the informal economy and the relationship between development and mining was carried out with the aim of developing an appropriate analytical framework. In this way, key concepts were identified not only to build sub-questions that helped answer the main research question, but also to guide the data collection techniques from a comprehensive perspective. In turn, this led to reinforce the fact that given the complexity of the case study, the use of qualitative techniques was necessary. Overall, on one hand the literature reviewed made it clear that it was not possible to perform an analysis of the causal relationship between small-scale and artisanal mining and environmental depletion from a perspective that isolates the economic, political and social dimensions of it. While on the other, it helped to frame the analysis of the State's role by providing information about the exogenous nature of its behaviour to the historical context in which develops.

Therefore, the methodological framework was designed in order to focus the attention of the analysis in the influence of the dynamic behaviour of the State.

The following chapters delve into each of the mentioned methodological tools. Both the analytical framework and the qualitative techniques employed will take shape to provide an accurate approach to the research problem. In this regard, special emphasis is placed on the analysis of the Peruvian legislation concerning the extractive industries, due to its usefulness to determine the historical evolution of the relationship between mining and State. Thereby, throughout the research the information gathered from the review of secondary data will be contrasted with the empirical data collected during the field-work under an analytical framework that explores the political, economic and social dimensions of the environmental conflicts in Madre de Dios.

Chapter 2

Conceptual and analytical framework

This chapter will develop theoretical approaches from political economy related to the informal economy and mining and development. Given the complexity of the small-scale and artisanal mining, it was necessary to build an analytical framework capable of providing a comprehensive analysis of the case study. In this way, the analysis of the research will be developed by taking into account key concepts from both of the mentioned perspectives, a fact that is explained in the section 2.3 of the Chapter.

2.1. Informal economy

The debates that revolve around the informal behaviour of certain economic actors have been historically influenced by the complexity of the political, economic, social and environmental scenarios where they thrive. Much of this results from informality going hand in hand with the evolution process of the market economy. Thus, whether at the small, medium or large scale, the informal economy has become the livelihood for many people around the world, mainly in developing countries. Over the last decades several international agencies have reported, that the informal economy seems to generate more than half of the non-agricultural employment in developing countries (Development Assistance Committee 2009). Nonetheless, one can argue that informality is not an isolated economic behaviour of developing countries, considering that the borders between informality and formality are intertwined in most of the North-South market transactions (Guha-Khasnobi et al. 2007).

The inception of the informal economy debate was set by Keith Hart in the 1970s, as part of a study related to the labour market in Accra, Ghana. For him, the employment dynamics in developed countries differ from most of the ones followed by the African economies, considering that the latter are characterized by a clear distinction between wage employment and self-employment (Hart 1973). It was with the purpose of conceptualizing the behaviour of self-employed actors, which develop economic activities outside the State regulations, that the term ‘informal’ was coined. Moreover, the research carried out by Hart propelled the discussions about the relation between informality and formality, taking into account that the existence of different sources of employment implies a rethinking of economic dynamics for development. Under these considerations, in the following years several theoretical perspectives were constructed to interpret the nature of the informal economy. According to Martha Chen these approaches can be condensed into four schools of thought: dualist, structuralist, legalist and voluntarist (Chen 2012).

As a consequence of the research carried out by Hart, the ILO published a report on employment and incomes in Kenya which emphasized the key role the informal sector played in the economic growth of developing countries (International Labour Office (Geneva) 1972). This perspective established the beginning of what would become the dualistic school, characterized by the development of an approach that links informality with poverty. Thereby, the

informal economy was primarily an urban phenomenon, characterized by small-scale market operations and the use of inefficient production methods developed under the umbrella of an unregulated and competitive market (Sethuraman and International Labour Office 1981). This definition was reinforced in further publications of the ILO, where the informal economy was related to the marginalized economic actors that did not have a chance to be part of the dynamics of the modern economy (Tokman 1985, Klein and Tokman 1988).

Furthermore, unlike the dualistic interpretation of informality, the structuralist school focuses its analysis in the effects of the relationships of production of the State-regulated market economy (Portes and Schauffler 1994). In itself, the structuralist approach is characterized by developing a perspective that sees the informal economy as 'all income generating activities not regulated by the State in social environments where other similar activities are regulated' (Portes and Castells 1989: 12). In this regard, special emphasis is put on the causal relation between market structures and informality, i.e., the expansion of capitalism leads to an increase in informality. Therefore, in this scenario the State becomes a key player of the market economy, which institutionalized capitalism through formal regulatory mechanisms.

In the case of the legalistic school, the conceptualization of informal economy is treated as a hostile relation between the market forces and the regulatory framework of the State (Chen 2012). For Hernando De Soto the emergence of informality is directly related to inadequate regulations promulgated by the State (De Soto 2002). In this regard, the State through different regulatory frameworks intervenes in the market by establishing legal parameters that limit the growth of emerging economies. This position stems from a questioning of the role being played by the State to promote economic growth in developing countries. In general, the legalistic school locates the informal economy between formality and illegality, under considerations of ends and means (Ghersi 1997). That is, the purpose of informal activities are not illegal as they pursue the same objectives of the formal ones, however the means are illegal because of the requirements established by the State regulations. Thus, an activity is informal when the social structures are not damaged if the State regulatory framework is disobeyed (Ghersi 1991).

Like the legalist school, the voluntarist perspective considers that informal activities are developed by economic actors that operate outside the State regulatory framework. However, this school does not emphasize in the causal relationships between formal and informal, as well as State and informal to explain the origins of informality. According to William Maloney the informal sector should be treated 'as an unregulated micro-entrepreneurial sector and not as a disadvantaged residual sector resulting from segmented labour markets' (Maloney 2004: 1). Thus, it is considered that informality is a chosen behaviour by certain micro-entrepreneurs that find it more profitable to engage in economic activities outside the law. This situation has a direct impact on the dynamics of the market economy, considering that the reduction of transaction costs of legality by the informal sector generates a competitive advantage over formal firms.

In general, each of the mentioned schools of thought provides important insights to understand the nature of the informal economy. As the analysis developed it was possible to identify a historical evolution of the debates about

informality; either from a comprehensive approach or from a biased perspective these conceptualizations have shown to be heterogeneous. This leads to the consideration that the different characteristics attributed to informality are related to the context in which it develops. Taking this into account, for the purposes of developing an adequate analysis of the research problem, the structuralist approach will be applied for the case of small-scale and artisanal gold mining in Madre de Dios. In the sections 2.1.1 and 2.3. of this chapter a review of this approach is going to be developed in order to highlight the key aspects of the structuralist analysis about informality and its usefulness for the case study of the research.

2.1.1. Structuralist approach

According to Alejandro Portes the informal economy must be understood as a dynamic process that is influenced by the scenario in which it develops (Portes 1985). In this sense, the definition of informality demands a review of the main political, economic, social and environmental dimensions that occur in a particular geographical area. Taking this into account, it is possible to notice that the characteristics of the informal economy vary from country to country and directly depend on the historical context where it is located. Moreover, these considerations seem to establish a differentiation between informal and formal economy, but at the same time show an implicit dependence among each other. Thus, this relationship is constantly changing and is influenced by the actions of the State regarding the regulation of the market economy. In this way, what in a specific context can be called informal and be banned by the State, in another may be legally regulated and accepted.

Thus, informal economies are characterized for being linked to the formal economy, have a differentiated labour scheme and the existence of a clear State position on unregulated economic activities (Portes and Castells 1989). On one hand, the comparative analysis of different country realities has shown that informality is not an isolated economic behaviour in commercial relationships, but part of the integral structure of the market economy (Peattie 1982, Standing 1986). In this regard, the transition from formality to informality and vice versa varies and depends largely on the competitive nature of the market in which they operate. On the other hand, the labour market in the informal economy ‘evolves along the borders of social struggles, incorporating those too weak to defend themselves, rejecting those who become too conflictive, and propelling those with stamina and resources into surrogate entrepreneurship’ (Portes and Castells 1989: 27). Therefore, it is considered that the majority of informal workers originally come from marginal sectors composed of migrants, a situation that does not necessarily imply a liaison with poverty. In this scenario of informal labour, the State plays an important role in stimulating informal economic activities as a means of economic development, particularly in marginal areas where there is a historical deficiency of State policies (Castells 1980). By doing this the public sector is legitimizing a process known as ‘informalization’ (Portes and Castells 1989), an effective tool to reduce unemployment and propitiate economic growth in contexts of economic instability.

Even though it was mentioned that informalization emerges under the support of State actions, there are certain specific causes that need to be con-

sidered due to their influence in reinforcing this process. The first cause is given by the need of formal firms to increase their competitiveness through the subcontracting of employees, thus diminishing the power of labour unions (Morales and Mines 1985). This action is grounded in the fact that the formal labor market implies a higher cost of production for companies legally recognized by the state, which directly affects its profit margin. Another cause of informality is the one that arises in response to the regulatory framework established by the State with respect to the market economy (Portes and Castells 1989). Mainly, what is sought is to evade the payment of taxes and social benefits to workers, i.e., reduce the costs of formality. Furthermore, a third case has arisen as a result of globalization, where international markets have led many developing countries' firms to move from the formal to the informal sector in order to reduce production costs (Waldinger 1996). The fourth cause of informality comes hand in hand with the process of industrialization in developing countries. As a mechanism to gain comparative advantage with products sold by developed countries, developing economies use informal production processes to access to international markets (Wong 1987). Finally, the fifth cause relates the emergence of informality with the global economic crisis, particularly that of the 1970s where vulnerable populations around the world found in the informal economy a solution to ensure the livelihood of their families (Barreiros et al. 1986).

Depending on the causes, the consequences of developing informality in a market economy are subjected to different effects. At the economic level is possible to identify that informality has favoured the emergence of commercial networks characterized by having close links with the formal sector. Thus, the existence of a relationship between small informal businesses and large corporations is more plausible at the global market, a situation that has accompanied the evolutionary process of market dynamics (Granovetter 1984). Furthermore, this expansion of informal economies has meant that labour costs have reduced significantly, which has a direct positive impact on the profitability of capital (Portes and Benton 1984). In this respect, informality has a dual function, to reduce unemployment and promote rent seeking in competitive markets, a situation that does not necessarily have positive effects at the social level.

In the social sphere the informal economy has led to the collapse of labour unions, undermining the capability of workers to have institutions that allow them to ensure their job security. Moreover, due to the lack of State regulations regarding labour relations in the informal economy enhanced by the changing nature of the same, the interactions between formal and informal sector promote an unfavorable scenario characterized by the absence of labour rights (Portes and Sassen-Koob 1987). It is so, that the impact of the social effects of informality is reinforced by the regulatory framework of the State that seeks to promote economic growth through capitalist regimes. As being self-regulated by the market, informality favours the increase of gaps between the economic strata of society. 'Thus, the more the informal economy expands, the more the class structure of each society becomes blurred, with horizontal fluid networks of activities substituting for vertical stable relationships of production' (Portes and Castells 1989: 31). In this regard, the mercantilist behaviour of the informal economy favours the diversification of the classes, where informal workers may not be equated to formal ones. Thereby, the bulk of the

informal labour force is going to be mostly composed of the social sectors historically marginalized, such as migrants and the indigenous, among others (Portes 1985, Roberts 1989).

Moreover, as it was mentioned, the State plays an important role in determining the political structure that will support market interactions, setting the scenario for the emergence of informal economies. In this regard, the political effects of the informality are related to the supervisory capacity of the State to ensure the compliance of its legal system. Thus the latter depends directly on the level of legitimacy of public institutions in societies where it is applied, since the acceptance of public actions is subject to the benefits they provide. On one hand, it is unlikely that in social settings where labour structures go hand in hand with the proper functioning of formal institutions the emergence of informal economies is allowed, as this would break the economic stability to which they are accustomed (Roberts 1989). While on the other, informality is likely to be conceived in self-sustained societies, characterized by subsistence activities and where the absence of State regulations is plausible (Lacey 2002). This situation usually occurs in social contexts where public institutions are virtually non-existent, which by default encourages and institutionalizes a parallel regulatory regime opposed to the legal framework of the public sector. According to Vittorio Capecchi, these kinds of societies are a thorn in the side for the State that seeks to expand and strengthen the formal sector through different regulatory mechanisms (Capecchi 1989).

At a more comprehensive approach of the effects of informality, it is also possible to notice that it has an impact at the environmental level. In this regard, the effects are related to the development of economic activities involving the use of natural resources and to the settlement of vulnerable natural areas. Thus, in the case of the natural resource management, informality can produce environmental depletion, in the sense that market dynamics are above the care of the biodiversity of ecosystems. That is, such activities are carried out in areas where the formal market does not have a particular interest (Clichevsky 2000). This situation is radicalized when the purpose of the informal activity is extractive, having as the central axis of its operation a rent-seeking behaviour at the expense of the accumulation of raw materials or minerals. In turn, the demand for labour for this type of informal activities implies that natural areas become populated centres and later in urban areas, thus increasing the population density in environmentally vulnerable areas (Clichevsky 2000).

In general, the economic, political and social effects of informality are not static phenomena, but are subject to the historical context in which the informal sector operates. For Portes and Castells (1989) the informalization depends on several factors which can be summarized in the relationship among formal, informal and public sectors. Even though, there are certain situations that naturally favour the emergence of informality, in most of the cases each of the stakeholders plays a key role in promoting and reinforcing the informalization (Kanbur 2009). In this sense, the scenario in which this process arises is influenced by the competitive dynamics of the market economy. This leads to the consideration that under this scheme the economic behaviour of the stakeholders implicitly supports the maintenance of a parallel unregulated sector. Thereby, both the State regulatory framework and the commercial relations of the formal economy in a capitalist regime propitiate the maintenance of the economic behaviour of informal actors. Thus, 'the processes and profile of

informal economy are historically specific, depending upon the relationship between the State, capital and labour in each country' (Portes and Castells 1989: 306).

In sum, the complexity of the relationship between formal and informal sectors and the State make it impossible to analyse the phenomenon of informality from a single perspective. Throughout the analysis developed about the structuralist school it became clear that the effects of the informal economy should be interpreted as situations that are giving shape to a particular social reality. This implies that the role of each stakeholder is dynamic and it is not possible to determine a unique pattern of behaviour, especially when the latter is subject to the requirements of an economic model that is in constant change. Therefore, the analytical approach to study these activities is conditional on the characteristics of the setting in which it develops.

2.2. Mining and development: natural resource curse or natural resource-led development?

Much of the theoretical approaches regarding the relationship between mining and development have revolved around the discussions of the natural resource curse (Bebbington et al. 2009). These debates arise from the analysis of the economic performance of countries that follow a developmental scheme based on the extraction of natural resources. In the absence of a common pattern of behaviour among these countries, the questioning of how to understand this association between development and extractive industries emerges from different perspectives. In this sense, Humphreys et al. argues that to understand this paradox it is necessary to note that the accumulation of wealth through the extraction of natural resources is dependent on the economic and political contexts in which it takes place (Humphreys et al. 2007). Thus, 'natural resource abundance generates a series of economic and political distortions which ultimately undermine the contributions of extractive industry to development' (Bebbington et al. 2008: 890).

According to Khodeli, the economic argument most discussed in the last decades about the resource curse is the 'Dutch disease' (Khodeli 2009). Mainly, proponents of this perspective use the disease analogy to interpret the negative economic impact of the sudden growth in foreign exchange earnings associated with the exploitation of natural resources (Krugman 1987). Thus, the resource curse takes shape through economic imbalances caused by overexploitation of natural resources. The problem is embodied in that the extractive activity ends up having higher productivity compared to other domestic economic activities, which favours the unproductiveness of other national industries. In relation to mining, economic imbalance is also related to the vulnerability of mineral prices in the international market, which directly affects countries that rely on exports (Sachs and Warner 1995). Furthermore, the market dynamics of commercialization of minerals is associated to 'enclave economies' that are linked to foreign markets, which impacts the real growth of the national economy (Bebbington et al. 2008). Although at numerical and empirical levels this hypothesis is testable, there are several implicit dimensions that affect the economic performance of a country.

Alongside the purely economic perspective, the institutional and political economy interpretation of the natural resource curse comes from the observation that not all resource-rich countries have problems of economic instability. This perspective is related to the degree of legitimacy of public institutions in those countries. Thus, the positive or negative effects of the extraction of natural resources for the development of a country depend directly on the quality of State institutions. In countries with strong institutions that promote transparency and participation of stakeholders in policy making, the economic benefits of revenues from resource extraction will be feasible (Boschini et al. 2007, Torvik and Robinson 2006). Meanwhile, in countries with weak institutions the distribution of wealth is inequitable, which feeds corruption and clientelism (Auty 2001, Rodrik et al. 2004, Ross 2009). Thereby, the effects of mining in the developmental path of a country are related to the quality and consequent legitimacy of public institutions in certain social contexts.

So far the interpretations of the relationship between mining and development have included economic and political issues that have social and environmental impacts. This implies that the extraction of natural resources has been seen as a means of development doomed to maintain a sustained economic growth while reducing the poverty rate. Thus making a comprehensive analysis of the above discussions, it is possible to talk about a natural resource-led development influenced by the historical context in which it develops. In this sense, a developmental model related to mining goes beyond a natural resource curse, considering that the governance dynamics of a country determines its path of development (Bebbington et al. 2009). By using the concept of 'realpolitik', Bebbington (2008) approaches to an interpretation of the relationship between mining and development that focuses on the complexity of the interactions between State, society and economy. This perspective is particularly important to understand the role of extractive industries in developing countries.

Under the mentioned considerations, in complex institutional scenarios such as the ones in many Latin American countries, a natural resource-led developmental model may lead to social and environmental conflicts (Bebbington 2012). In this regard, the interactions among stakeholders play an important role in the definition of the nature of the conflicts. On the one hand, social problems may arise as a response to inadequate distribution of wealth; while on the other are related to struggles for command and control over natural resources (Arellano-Yanguas 2012). Implicitly in both cases, there is a situation that undermines the environmental stability of the ecosystems where mining activities are taking place. According to Bebbington 'the effects of extraction in any territory and the ways in which it is negotiated depend very much on the prior political economic history of that territory' (Bebbington 2012: 5). Therefore, to understand the developmental path followed by a resource-rich country it is necessary to analyse the evolution of the relationships between stakeholders and extractive industries.

Given that interactions between actors involved in the extraction of natural resources can lead to trigger conflicts, the institutional dynamics are conditioned to evolve in response to this situation. In this regard, among all stakeholders, the public sector will play a key role in the regulation of extractive industries to avoid social and environmental conflicts (Orihuela and Thorp 2012). Through the design and implementation of legal mechanisms, public

institutions seek to shape the behaviour of the extractive industries regarding natural resources, i.e. the State response could be interpreted as a causal relationship of action-reaction. Likewise, despite a concrete public response to conflicting scenarios, not necessarily those actors involved are going to reach an agreement about the nature of the conflict (Arellano-Yanguas 2012). This is due not only to the gradual process of adaptation to a new regulatory framework, but also to the complex relationship between environment and society, where a solution cannot be achieved regardless of the background that led to the emergence of conflict. So that, the negative effects of a natural resource-led developmental model are not limited to a specific historical moment, but comes from an evolutionary process of the interplay among the State, society and extractive industries (Bebbington 2012).

As it can be noticed, the State becomes the key actor whose analysis can help to understand the underlying social and environmental dynamics of conflicts. In this way, 'the state is implicated in the creation of governable spaces in which extraction can continue even while surrounded by other spaces characterized by conflict, insurgency and/or absence of state-provided services' (Bebbington 2012: 220). Thus, the State actions regarding extractive complex scenarios will materialize in institutional changes that seek to maintain the pattern of development while policy mechanisms are incorporated in order to face conflicts. In this sense, the dilemmas and challenges faced by the State during the policy making process are related to the determination of its political, economic, social and environmental priorities under a natural resource-led development scheme.

2.3. Analytical framework: Mining, informal economy and development

This research paper analyses the influence of the State's behaviour in the causal relationship between small-scale and artisanal mining and environmental depletion in Madre de Dios from a qualitative perspective. In order to cover the different aspects that may arise from the complexity of the case study, the analysis needs to allow identifying and understanding the effects of the interplay dynamics between State and mining. Thus, taking into account that artisanal and small-scale mining are considered informal economic activities by the Peruvian State and that mining itself has historically been the main driver of the development of the country, a literature review of the main theoretical approaches was performed. It is so that both debates about the informal economy and the relationship between mining and development were analysed to identify key concepts that are going to be employed throughout the research.

In this sense the theoretical approaches from the informal economy provide insights about the institutional dynamics that shape the informal behaviour of economic actors (Portes and Castells 1989). Therefore, the analysis of the relationship between the formal and informal sectors and the role of the State in the process of informalization, developed by the structuralist perspective, allow recognizing dimensions and behavioural patterns of stakeholders involved in mining (Kanbur 2009). On one hand, there are economic and social dimensions that respond to policies aimed at promoting mining activities. While on the other, there are political dimensions that respond to social de-

mands for greater economic stability. Although the urban informality was the base of the analysis of the informal economy theorists, the rural nature of the dynamics of informal mining in Peru can be interpreted from the same perspective. In this sense, there is a relationship between the emergence of the informal sector and the pursuit of the national economic development (Portes and Schauffler 1994). It is in this latter aspect that the theoretical debates about mining and development presented by Bebbington (2012) are key for the analysis of the case of Madre de Dios. In this sense, by developing a historical review of the role of mining in the country development, it is possible to notice that the emergence of such extractive activity is intrinsically linked to policies focused to economic growth through natural resource extraction (Bebbington et al. 2009).

Furthermore, the theoretical approach about mining and development added valuable concepts to the analysis of the research problem by putting special emphasis in the emergence of social and environmental conflicts as a consequence of a natural resource-led development model (Bebbington 2012). In this regard there are two aspects that must be taken into account from this theory; the first one goes hand in hand with the social and environmental effects of natural resource extraction as well as the institutionalization of an economic dependence path that materializes in the struggle over the command and control of resources (Orihuela and Thorp 2012). Meanwhile the second is linked to the first, in the sense that the reaction to conflict drives to the institutional change (Bebbington 2012). In both cases, it is possible to notice that the role of the State influences the economic, political and social dimensions of environmental conflicts.

Thus, both theoretical debates about informal economy and natural resource-led development provide key concepts to develop a comprehensive analysis of the research problem. In this sense, the causes of the environmental depletion in Madre de Dios will be approached through the identification of three concepts such as informalization, institutional change and conflict at the political, economic, social and environmental dimensions of mining. That is, what is sought is to develop an interpretation of the impact of small-scale and artisanal mining in the four dimensions with the utilization of the three concepts taken from the theories reviewed. This analysis will allow approaching the influence of the behavior of the public sector in relation to mining from a holistic manner, considering that the functional role of the State covers the mentioned dimensions. From this, three research sub-questions arise:

- How and why did the State establish a natural resource-led development model?
- How did the informalization process of the small-scale and artisanal mining occur?
- How did environmental conflicts emerge?

Moreover, by delving in the literature reviewed it was also possible to identify the political, social, economic and environmental implications of informal economies and natural resource-led development. These were analysed in the theoretical debates to explain complex processes such as informalization, institutional change and conflicts. Taking this into account, the qualitative research techniques in this paper will employ relevant topics per dimensions, taken from the theory, to analyse the data gathered (see Figure 2.1):

- Political: Legitimacy and role of public institutions, general legal framework and sector-specific legislation, corruption.
- Economic: Public budget, distribution of GDP, tax exemptions.
- Social: Demographic change, public services provision, labor rights.
- Environmental: Natural resource endowments, deforestation, loss of biodiversity.

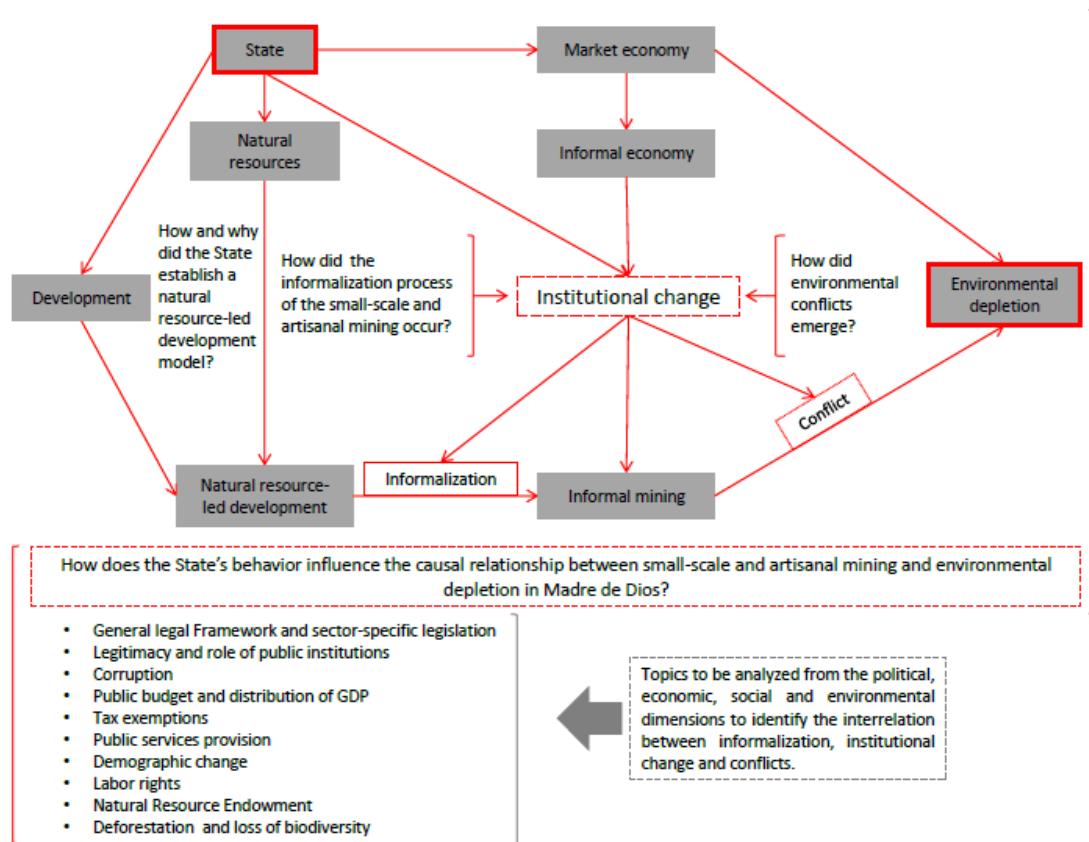


Figure 2.1 Structure of the analytical framework

(Source: Author own elaboration)

Chapter 3

Institutionalizing economic dependence on gold-mining

The evolution of the modus operandi of small-scale and artisanal mining in Peru has been strongly influenced by the agrarian rationality of a peasant economy, particularly from the Andes of the country (Pachas 2010). This situation is reflected in the interactions between all the actors involved in gold mining, becoming a key issue to understand the economic developmental dynamics of the region (Alvarez and Naughton-Treves 2003). As a whole, the economic system of peasants has been characterized by a complex geographical scenario for land allocation, as well as a networking system that promotes the involvement of the family members in the agricultural production processes (Alvarez and Naughton-Treves 2003). From a social and economic perspective this behaviour has helped the peasants to improve their adaptive capability through the construction of strong family ties that derive in a labour network with common economic interests.

Under the market economy premises, this peasant rationality responded to what some authors have called ‘informal economy’ (Portes and Castells 1989). A historical review of the behaviour of the Peruvian State since the beginnings of the last century shows how at different stages that the public sector promoted the inception of informal economies in the mining sector through regulation. This process was sustained through decades under the umbrella of the promotion of extractive industries for economic development. Nonetheless the scenario changed when environmental and social conflicts arose. Thus, this chapter seeks to answer the first two research's sub-questions through the analysis of the mining regulatory framework. Thereby, the answers about the how and why a natural resource-led development was established by the State as well as the way about how the informalization of miners occurred will set the path to understand the emergence of environmental conflicts.

3.1. Institutionalizing a natural resource-led development model

Since the early twentieth century the legal framework for mining in Peru prioritized the extraction of gold through the use of unskilled labour and rudimentary technologies, in order to establish a mining system that encourages foreign investment (De Echave 2001). Being an heir country of a colonial economic tradition and to unify all the regulations related to extractive activities, the first Mining Act was enacted in 1901, with the name of the Mining Code (Lira and Aristondo 2007). The particularity of this Act was that the land owner also owned the mineral resources contained therein. This implied that there was no distinction between land ownership and subsoil for purposes of utilization of mineral resources. Subsequently, it was not until 1950 that with the military government of the General Manuel Odría a reformulated Mining Code was enacted, establishing a distinction between land ownership and subsoil (Sama-

mé Boggio et al. 1979). Moreover, this Code defined mining as an activity of national interest, providing advantages and tax exemptions for miners.

At this stage, the State expressed its willingness to achieve an economic growth through a natural resource-led development model. Thus, the public sector replicated the colonial background of the country, where the main economic activities were always related to the raw material and mineral extraction and commercialization (Lira and Aristondo 2007). Although the State intention seemed to be legalist (De Soto 2002, Ghersi 1991), the first two Mining Codes did not establish a differentiated status between small-scale, artisanal, medium and large mining corporations. This situation leads to assume that the only concern of the Mining Codes until that time was the maintenance of the economic sustainability of the country, as well as ensuring a constant flow of private investment.

Furthermore, due to the increase of mining concessions and with the purpose of institutionalizing the regulation and supervision of mineral extraction, the Ministry of Energy and Mines was created in 1968 (Poder Ejecutivo, República del Perú 1968). However, in October of the same year, the political and economic context of the country changed radically, because of the coup carried out by General Juan Velasco against the government of President Fernando Belaunde (Contreras and Cueto 2007). Thus the country went from a democracy to a military dictatorship, which led to the nationalization and creation of public enterprises declaring the State ownership of mineral deposits as inalienable and imprescriptible (Lira and Aristondo 2007). This meant a milestone in the state's policy regarding mining. On the one hand the Mining Bank of Peru and the Mining Investment Fund were created (Poder Ejecutivo, República del Perú 1969), and on the other there was a clear interest of the government to support the economic development of rural areas. Thus, the creation of these public institutions marked both, the beginning of the policy of promotion and encouragement of domestic mining industry, with emphasis in small-scale miners and public enterprises, as well as the beginning of the informalization process.

The big step towards a new mining regulatory framework was given in 1971 with the enactment of the General Mining Law (Poder Ejecutivo, República del Perú 1971). With this legislation the public sector expressly stated that the mining industry's main function was to contribute to the social and economic development of the country. Many complementary parameters were incorporated for the commercialization of minerals and certain tributary benefits were given to mining producers. Additionally the Law determined the stratification of mining activities, establishing a distinction between large, medium and small mining activities. Until this stage the artisanal mining activities were not considered due to its precarious nature that at that time did not represent any economic interest for the State. Most of this type of mining was practiced by peasants that lived near mining locations and who had agriculture as their main economic activity for subsistence (Pachas 2010). In the following years the state had the need to incorporate complementary legal provisions to the General Mining Law, with the purpose of regulating aspects related to the geographical diversity of the country. Thus, in 1978 was set the differentiation parameters for the exploitation of gold mining locations on the coast, highland and jungle (Poder Ejecutivo, República del Perú 1978). For the regions of the highland and coast tax benefits related to the importation of equipment were

established, while for the jungle the mining activities were exempted from all kinds of taxes and even income tax (Pachas 2010).

In the early 1980s the return to a democratic institutional system had an impact in the public position about mining. With the fall of the military dictatorship, the democracy in the country was established with the second government of Fernando Belaunde Terry. Emulating the actions of the military government, one of the first political moves of the government was the enactment of a new General Mining Law in 1981 (Poder Ejecutivo, República del Perú 1981). The main objective of this Law was the return to the liberal scheme of the government, with the purpose to attract foreign investment under the premise of reactivating the mining sector that was stagnated by the statist policies of the previous government. With this, the importance of mining is reaffirmed as a key part of generating income for the country, consolidated itself as a matter of policy that transcended ideological differences between governments.

Political transitions, the internal armed conflict and the international economic crisis of the 80's caused economic instability in the country, impacting on the public policy of attracting foreign investment for mining (Contreras and Cueto 2007). As a result, Peru entered a period of economic stagflation that eventually paved the way for the adoption of Washington Consensus policies in the 1990s (Lira and Aristondo 2007). Thereby, in the early 1990s, during the first government of Alberto Fujimori, the beginning of a process of deregulation of private investment started, putting special emphasis on the capture of foreign capitals which materialized in the Law for the Promotion of Foreign Investment and the Framework Law for Private Investment Growth (De Echave 2001). Parallel to this process of economic liberalization, in 1991 the Law on Investment Promotion in the Mining Sector was enacted and complemented in 1992 with the Unified Text of the General Mining Law (Ministerio de Energía y Minas, República del Perú 1992) and with the signature of several bilateral and multilateral agreements to provide greater assurance and security to foreign investors. Among the most important aspects of this Law are the maintenance of State ownership over minerals and the liberalization of the market, allowing to any person, not just the State, its commercialization.

In general, the evolution of the mining regulatory framework in Peru have shown that there is a State policy that transcend governments, providing insights to argue that the country has been following a natural resource-led development model that respond to the market economy dynamics. Until the present time there have been three amendments to the General Mining Law in 1971, 1981 and 1992. Currently the 1992 Law is the one that is still being applied by the government in the present and the one that serves as a base for the regulation of the small-scale and artisanal gold mining. Moreover, as it may be noticed, even in this last regulatory stage that seeks to modernize the mining activities, the primacy of the economic factor continues embodied in the State discourse. In the following years this perspective is going to be supported by the representativeness of the mining income in the national GDP. During the period between 1995 and 2004 mining was an important driver of the economic development achieved by the country. In this period, the increase of the GDP coming from mining occurred rapidly in relation to the exports of the extractive sector, rising from USD 2.615 million to USD 6.953 million in 9 years, that is, an increase of 166% (Glave and Kuramoto 2007). Thereby,

throughout the analysis of the evolution of the mining regulatory framework it is possible to identify how the institutional change of the State was responding to a developmental model that seeks to achieve economic growth through the extraction of natural resources (Bebbington et al. 2008).

3.2. Informalization process and emergence of environmental and social conflicts in Madre de Dios

The bulk of the mining regulation in Peru has been committed to promoting medium and large mining in order to ensure the sustainability of long-term mineral extraction operations. However, during the early 1970s the State considered necessary the incorporation of small-scale and artisanal mining in the general legislation, due primarily to the economic importance that this activity represented for the rural population of the country (Pachas 2010). With the creation of the classification of the mining strata, as well as the Mining Bank and the Mining Investment Fund, the public sector laid the foundation for expanding the economic developmental potential of small-scale and artisanal mining operations. This decision was benefited from the rising price of gold, reached more than USD 800 per ounce during those years, which increased the number of small and artisanal miners (Glave and Kuramoto 2007). Consequently, what initially were sporadic mining operations carried out by unskilled workers, mostly peasants, was becoming in a truly profitable business supported by formal regulations.

In this regard, the growth of the demographic rate and cultural diversity in the region show that the population increases have been linked to the development of extractive industries. The Table 3.1 provides a more specific overview of the sustained population growth in Madre de Dios:

Demographic growth 1940 - 2013

Year	1940	1972	1981	1993	2007	2013
Population	25,212	25,154	35,788	69,854	112,814	130,876

Source: Author own compilation, data retrieved from INEI (INEI. 2014).

In a period of approximately 70 years, the population grew more than 600%, with the highest peak between 1993 and 2013. At the same time, this demographic increase has been going hand in hand with public policies that promote small-scale and artisanal mining. In fact, the latest data of population dispersion provided by the INEI show that population growth in Madre de Dios has been emphasized in the districts where gold mining is the main economic activity (INEI 2008). It is not a coincidence, taking into account that approximately 90% of districts in Madre de Dios were born as mining settlements (Pachas 2010). That is, the region has been developing under the shadows of extractive activities, primarily gold mining.

Under this scenario, the Law of formalization and promotion of small scale and artisanal mining was enacted in 2002. This Law expressly recognized that 'small-scale and artisanal mining are activities based on intensive use of

labour that make them a great source of employment generation and productive co-benefits in the areas of influence of its operations, which generally are the most remote and depressed of the country, becoming centres of development' (Congreso de la República, República del Perú 2002: Article 2). Contrary to look for the mitigation of the environmental impacts of mining, the Law sought to keep promoting the activity. In this regard, the only environmental compromise to start mining was the submission of a Declaration or Environmental Impact Study. Even more, it is important to note that in this Law a miner was considered small if he/she had a concession that granted a possession of up to 2,000 hectares of land in order to extract a maximum of 350 metric tons of mineral matter per day. While artisanal miner was the one who had a concession that granted a possession of up to 1,000 hectares of land in order to extract a maximum of 25 metric tons of mineral matter per day.

Considering both spatial and extractive dimensions of mining established in the Law, it is not possible to avoid questioning, how many miners are needed to move from 25 to 350 metric tons of mineral matter per day? Is not necessary to have heavy machinery to perform this type of work? As a consequence not only the number of mining concession holders increased, but also began to develop several mining related economic activities. Thereby, some actors that historically were not devoted to extractive activities started doing mining, such as indigenous communities and farmers (Pachas 2010). Mining became the economic engine of Madre de Dios, as it was planned by the State in the 2002 regulatory framework.

In 2008 the formalization Law was amended with the purpose of fulfilling the compromises acquired in the Free Trade Agreement between Peru and United States of America (Poder Ejecutivo, República del Perú 2008). One of this was the promotion of private investment, employment and micro and small enterprises, in order to increase and diversify exports and greater efficiency in the allocation of production outputs (Pachas 2010). For this reason and because the small-scale and artisanal mining had become one of the most productive activities of the country, it was found convenient to take steps to ensure the productivity and efficiency of this sector. There were no major changes in relation to environmental protection parameters regarding the original Law, but salient modifications were made in relation to the role of Regional Governments. It is so that under the umbrella of the process of decentralization and with the argument of the assignment of competences to Regional Governments, all the previous compromises acquired by the central government were transferred.

Up to this point, environmental degradation in Madre de Dios was not an important topic of the public agenda. However, another of the State's commitments with the signing of the FTA was the improvement of the command and control over environmental goods through the promotion of the sustainable use of natural resources and the mitigation of the process of environmental degradation. This was materialized in 2008 with the creation of the Ministry of Environment a public institution empowered to design and implements the environmental policy in the country (Poder Ejecutivo, República del Perú 2008). This situation changed the entire panorama of the formalization and promotion of small-scale and artisanal mining in the country. One of the first actions of the Ministry was its influence in the enactment in 2010 of a legislation that prioritize the need to formalize small-scale and artisanal mining in

Madre de Dios as a way to address the environmental problems in the region (Poder Ejecutivo, República del Perú 2010).

Thus, the breaking point for the institutional change of the State regarding environmental degradation in Madre de Dios emerges during this period. It is in the subsequent regulations developed where the term informal was institutionalized (Poder Ejecutivo, República del Perú 2012). In the following years the differentiation between informality and illegality in the Law was going to become the main issue of social conflicts, since the illegality leaves a significant interpretative gap that goes hand by hand with the marginalization and criminalization. By default the public sector started to make reference to informal and illegal mining as the main cause of environmental problems in Madre de Dios (Alvarez et al. 2011). In this sense, the public discourse radically changed and henceforth the strategy of the State was focused in the design and implementation of several regulatory instruments to formalize small-scale and artisanal miners.

Chapter 4

Getting closer to reality – Fieldwork

The analysis of the mining regulatory framework has shown that since 2010 the State's behaviour regarding the promotion of small-scale and artisanal mining has changed. This was mainly due to the emergence of environmental conflicts in mining areas. In this scenario, the behaviour of the State combined with the one of the miners has led not only the increasing of deforestation but also the emergence of social conflicts in the region. In this regard, after more than four years of promoting the formalization of miners as a mean to reduce environmental depletion, the scenario is becoming more complex. Considering that this is an ongoing phenomenon, the Chapter analyses the data collected from the fieldwork to answer the third research sub-question about how the environmental conflicts emerge in Madre de Dios. More specifically, this implied to look into the causal relationship between the role of the State, mining sector and civil society and environmental depletion through the analysis of political, economic, social and environmental dimensions. In this sense, a preliminary stakeholder analysis was developed to identify the actors involved in mining in the region. Thus, fifteen actors were interviewed and in order to improve the quality of the research and balance the inputs from the data collected, the interviews were equitable divided in five actors per each sector (see Appendix 1).

4.1. The context of fieldwork

The public atmosphere in Madre de Dios was influenced by different events that enhanced the quality of the data collected. On the one hand, my status as an independent researcher allowed me to access to privileged information from the mining sector as there is a clear apathy from them towards the researchers coming from NGOs as well as from international cooperation agencies and journalist. On the other hand, at the political level, the period of elections of local representatives was one of the main issues of the public agenda to the point that the ex-president of the mining federation is leading the surveys for becoming the next Regional President.

Also, the former commissioner in charge of leading the public interventions against informal miners was announced as the new Minister of the Interior (in charge of ensuring the internal security of the country). This State decision was bad seen by the mining sector, classifying it as a 'provocation from the State and a prize to the person that attacked miners under a regulatory umbrella'¹. Additionally, during the first half of 2014 the State announced the appointment of the economist Hernando de Soto (legalist school of informal economy) as adviser for the restructuration of the regulatory framework for the formalization, considering that until the date there is no formalized miner in the region (RPP. 2014).

¹ Personal interview with miner, Madre de Dios, 16 August 2014.

Meanwhile, the economic recession began to wreak havoc in the livelihood of the population of Madre de Dios, which favoured the emergence of public protests. The latter increased when it was announced the start of operations of the company Hunt Oil in the so-called Lot 76 of Madre de Dios. For the bulk of the miners interviewed, this concession granted in 2005 by the Peruvian State (Ministerio de Energía y Minas, República del Perú 2005) represents one of the largest cadastral and environmental regulatory inconsistencies of the public sector, considering that there are about 1600 mining rights to which the Lot 76 is being overlapped (Arriarán. 2014). This reinforces the fact that the State continues prioritizing a resource-led development based in the economic growth, taking into account that Hunt Oil expects to discover the largest deposit of natural gas in Peru, equivalent to twenty trillion cubic feet per day (Arriarán. 2014). All this issues took place in a scenario where several conferences regarding the REDD+ initiative were being promoted in order to support the role of the State in Madre de Dios. Moreover the current eco-friendly behaviour of the public sector is being reinforced by its compromise to hold the twentieth Conference of the Parties (COP) in December 2014.

4.2. Analysis of the political dimension

Throughout the interviews conducted regarding this dimension, much of the emphasis of the interviewees' responses was put on the political instability caused by the formalization Law of small-scale and artisanal mining carried out by the State. Going from the central to the regional level, the actors identified which steps undertaken during the implementation process of the policy influenced in the blind alley in which all of them are located. In this sense, by analysing the information provided by each sector it was possible to notice similar opinions for the same topic. In the responses related to the legitimacy and the role of public institutions, there was a notorious consensus about the absence of coordination between public institutions. Whether for reasons related to the empowerment from the central to local policy makers or for the lack of governance capabilities, this situation leads to public distrust in detriment of the State. Even though the public sector and the civil society agreed in the need of halting gold mining through regulations, the explicit failures in the implementation identified by each actor suggest that the overall policy making process did not took into account a comprehensive perspective. Thereby, the institutional change of the State materialized in the formalization regulatory framework does not reflect the interests of the target population and seems that is aimed to fail.

In general, for the public sector the State is seeking to promote sustainable activities in the region. By establishing parameters in the sector-specific legislation of mining the State not only 'has stressed the need to have the most clear and transparent framework as possible to formalize informal mining in Madre de Dios, but has also stressed the need to promote complementary economic activities to mining'². In counter position to this posture, the miners perceive

² Personal interview with Humberto Cordero from MINAM, Madre de Dios, 12 August 2014.

that the current actions of the State to formalize mining are oppressive and have as a real intention the banishing of gold mining in the region. For them, this public behaviour is subjected to the interests of NGOs and international cooperation agencies, ‘we are not only fighting against the government but against the global interests, because all these developed countries will not stop for a second their polluting industries’³. Moreover, the civil society supports the State behaviour to stop environmental degradation and promote joint ventures with NGOs and international experts in natural resource management. Nonetheless, ‘Madre de Dios itself is bipolar, the subjects are the plants or the forest or the human beings and in this regard the State is leaving aside many factors that are complicating the expected achievements of its policy’⁴.

4.3. Analysis of the economic dimension

The main concern mentioned by the interviewees regarding this variable was related to the importance of gold mining for the local economy. Even if there is a disparity of opinions among the sectors about the support to extractive economic activities as a local developmental mean, all of them agreed in the rapid economic growth of Madre de Dios due to gold mining. It was emphasized that this phenomenon did not occur in the past with any other extractive activity, such as rubber and timber. Furthermore, during the interviews no clear answers were provided about alternative economic activities that could replace the incomes generated from mining. The latter point is important to mention, considering that according to the miners interviewed (usually a worker with empiric knowledge), they can earn approximately between € 900 and € 1100 a month that is almost five times the current minimum wage in Peru.

Throughout the answers provided the actors highlighted the intrinsic relation that exists between gold mining and local economic sustainability. This became the starting point of their explanation about the influence of mining in the livelihood of the local population. In this sense, the distribution of economic activities taking place in the region is strongly dependent on the demand generated by the miners. Thus, the State actions to formalize miners implicitly impact in the economic stability of the region. Although it may seem questionable, the public sector is aware of this situation, but ‘given the environmental circumstances was necessary to take emergency actions to preserve the biodiversity of Madre de Dios’⁵. However, ‘despite the mining evictions, mining is still growing in the region’⁶.

This biased perspective of the public sector to address the problem has not only generated economic recession, but has also legally framed the formalization of a sector that before was not considered informal and consequently illegal. The latter is being fed back by the low legitimacy of public insti-

³ Personal interview with Alex Condori from FEDEMIN, Madre de Dios, 14 August 2014.

⁴ Personal interview with Victor Pachas from CRS, Lima, 27 July 2014.

⁵ Personal interview with Guimo Loaiza from Ombudsman office, Madre de Dios, 12 August 2014.

⁶ Personal interview with public officer from GOREMAD, Madre de Dios, 13 August 2014.

tutions in the region. The observations and experiences in the fieldwork might corroborate the economic problems faced by the population, not only inflation is rising but the consumption of smuggled products is becoming in the best way to save and make money. Meanwhile, if it is true that civil society supports the measures taken by the public sector, it also recognizes the need to broaden the scope of State actions. 'Mining activities have not stopped in the region; the economic incentive has made the amount of people and families who are engaged in mining activity increase considerably'⁷. Thereby, it can be argued that the bases of the economic structure of the region are being affected by specific regulations that propitiate social conflicts. Contrary to create social awareness of environmental protection, the State actions are not supported by the local population due to the negative economic impact generated in their livelihoods.

4.4. Analysis of the social dimension

Two aspects were highlighted by the interviewees as key issues to understand the social problematic caused by gold mining. The first one was the high migratory rate and the second the deficiency of the State to provide adequate public services. Both are related, in the sense that the increase of the migration in the region went hand by hand with the demand for hand labour to work in mining, while the local infrastructure was not designed to withstand the demands of such population. Moreover, most of the districts of Madre de Dios were born as gold extractive camps, which mean that were not planned in the cadastral structure of the region. According to the mining sector the districts have developed institutional arrangements of self-sustenance as a response to the absence of public institutions in these areas. In this regard, the inadequate provision of public services is a problem that is also related to the lack of regional budget and a weak management capacity of local institutions.

Furthermore the data collected provides signs that State's actions are governed by a conduct of action-reaction regarding the social conflicts in the region. According to the public sector, the implementation of policies in Madre de Dios has been given pursuant to the requirements of the population and not in a planned manner. To a large extent, this situation is reflected in the institutional change that took shape in the current biased position of the State against gold miners, a behaviour that neglects important social demands generated collaterally by mining. 'There are identification, health and education problems in the region, all due to migration of workers for extractive activities'⁸.

Likewise, for the miners the excessive rudeness that is being applied by the public sector to stop mining is engendering social conflicts, 'the whole issue of the satanization of mining has been a Machiavellian plan'⁹. This effect of the State actions is also seen by the miners as an excuse to cover up the inefficiencies.

⁷ Personal interview with Juan Navarro from Caritas, Madre de Dios, 17 August 2014.

⁸ Personal interview with Guimo Loaiza from Ombudsman office, Madre de Dios, 12 August 2014.

⁹ Personal interview with Carlos Bustamante from FEDEMIN, Madre de Dios, 14 August 2014.

cies of management that impede to provide adequate services to the population. The observations during the fieldwork corroborate that there is no public infrastructure to meet the needs of the population, especially in the mining districts. Much of these failures to cover inhabitants' needs translate into situations that might lead to violations of labour rights from both sides State and miners. This concern was emphasized by the civil society, considering that there is a wide range of behaviours susceptible to human rights violations. Even though their support to State actions, the civil society organizations see as guilty of the social conflicts in the area to both sectors. This issue is interpreted by them as 'a problem of coexistence that is really difficult to solve because of the imbalance between needs and the public capabilities to satisfy them'¹⁰.

4.5. Analysis of the environmental dimension

The analysis of this dimension summarizes the position of the interviewees about the influence of gold mining in the environmental depletion of Madre de Dios. Through explicit and implicit responses the three sectors agreed that extractive activities are the main cause of deforestation and loss of biodiversity in the region. In this regard, the debate was focused in which kind of economic activities were adequate to be carried out in the jungle, in order to replace or accompany mining. On the one hand the civil society recognizes that extractive activities should not be allowed, and on the other the State reaffirms its position that extractive activities are necessary to continue with the development of the region, but as long as they are environmentally friendly. This dynamic makes the miners questioning the role of the State, considering that the regulatory framework according to them is contradictory and actually prevents them from performing mining.

Although the State has taken radical measures to stop environmental depletion, the whole scenario in Madre de Dios seems to get worse. It has been almost five years since the process started but without clear indicators that the environmental damage has been stopped or remediated. Mainly because 'there are between 2,500 and 3,000 mining concessions and to date not a single miner has been formalized'¹¹. There are two facts that were repeatedly cited by the interviewees that can help to understand this policy failure, one is the lack of legitimacy of public institutions and the other are certain aspects in the regulatory framework that actually impedes the formalization of miners. The latter has been specially highlighted by miners, for them the State does not represents the real interests of the local population and 'has made the formalization process unworkable'¹². Among this regulatory limitations there are hidden institutional issues known by all the actors that certainly hinder the formalization process, 'in the same concession there are lands for agriculture, forestry, tourism, among others; there are around 5 or 6 holders in the same geographical

¹⁰ Personal interview with Vidal Salazar from FADEMAD, Madre de Dios, 14 August 2014.

¹¹ Personal interview with Humberto Cordero from MINAM, Madre de Dios, 12 August 2014.

¹² Personal interview with miner, Madre de Dios, 16 August 2014.

space¹³. Thus, the problem of mining in the region is also materialized in the violation of territorial rights.

Even for the civil society, the environmental degradation is just the tip of the iceberg of a serial of institutional and social problems in the region. They suggest that the whole process of formalization should be part of an integral strategy, because 'if this process comes to a good end, then the issue of overlapping rights arises due to the failure to coordinate the various sectors of the State'¹⁴. Furthermore, 'in practice, the issue of coexistence of land rights and the possibility to use it depends heavily on the sector and the economic variable'¹⁵. Thus, the possibilities for stopping the environmental degradation are subjected to the institutional dynamics that surround the natural resource endowments in the region.

4.6. Contrasting analyzes

The analysis of the political, economic, social and environmental dimensions allowed identifying behavioural patterns among the three sectors interviewed that help to answer the research sub-question about how did environmental conflicts emerge in Madre de Dios? The information gathered indicates that the environmental conflicts emerge as a consequence of the harmful behaviour of small-scale and artisanal miners regarding the environment. By deepening in this cause-effect relationship, it can be noticed that this harmful behaviour was implicitly established by the State through the promotion of extractive industries in the region. In this sense, two relevant topics were highlighted consensually by the interviewed actors to indicate that a natural resource-led development model was established decades ago in the area by the State. The first one is the importance of gold mining for the local economy and the second is the high migratory rate. Both topics reinforce each other in the sense that the demographic change responded to the demand of the local labour market to extract gold. Moreover, this situation was known and promoted by the public sector through the granting of mining concessions without establishing major regulatory barriers. This can be considered what Portes and Castells (1989) called the informalization process, where the State's behaviour regarding the market dynamics led to the emergence of the informal sector. Thereby, even if historically the small-scale and artisanal mining were not considered informal economies until the enactment of the formalization Law, the emergence of environmental conflicts responded to the harmful extractive techniques of informal miners.

Likewise, as well as the informal mining led to the emergence of environmental conflicts, the institutional change of the State to address the latter led to the emergence of social conflicts. The interviews have provided valuable information to determine that the behaviour of the public sector to implement

¹³ Personal interview with Mario Tapia from GOREMAD, Madre de Dios, 13 August 2014.

¹⁴ Personal interview with Luisa Ríos from SPDA, Madre de Dios, 18 August 2014.

¹⁵ Personal interview with Yessenia Apaza from ACCA, Madre de Dios, 18 August 2014.

the formalization Law has caused political instability. With the criminalization and consequent marginalization of informal miners, the economic and social structures of the region were affected. This situation was reinforced by the inadequate provision of public services in mining districts. In this sense, the environmental depletion went hand by hand with the inception of social conflicts, a situation that can be interpreted from two perspectives. The first is that one thing leads to another and vice versa; and the second is that social conflicts emerged as a response to certain behaviours of the public sector that affect the livelihoods of the dwellers of the region. For the case of Madre de Dios, the second perspective adjusts to the current gold mining scenario, in the sense that institutional change arose as a response to environmental depletion and at the same time social conflicts emerge as a response to institutional change.

In general, in the analysis developed is possible to identify the interrelation between the three processes of informalization, institutional change and conflicts. This can be summarized in the fact that the emergence of environmental conflicts responded to the extractive behaviour of informal miners. By responding to the market dynamics, the State promoted the informalization process of small-scale and artisanal mining through the enactment of regulations that sought to establish a natural resource-led development model in the region. Moreover, the institutional change of the State to address the environmental problems led to the emergence of social conflicts. This latter aspect needs to be highlighted considering that the theoretical debates about mining and development do not deepen in the causal relationship between environmental and social conflicts from the informal extractive activities.

Chapter 5

From natural resource-led development to environmental depletion

The findings of the analysis of both the mining legislation and the fieldwork leads to consider that the evolution of the interplay among gold mining stakeholders in Madre de Dios has been developed under the umbrella of a regulatory framework that seeks to maintain a natural resource-led development model. Currently, the political, economic and social situation of the region has brought to light positive and negative aspects of mining, either for its contribution to the economic development or for its negative impact on ecosystems and livelihoods of rural populations. Thus, the analysis has shown that beyond a particular historical context, the emergence of environmental problems has been built by the State over the decades through different policy mechanisms. On the one hand a solid economic structure based on the extraction of natural resources was created and on the other the efforts to restructure the extractive system without losing the path of economic development is fostered. Thus, small-scale and artisanal mining went from being a panacea for development to become the main environmental concern of the country. This chapter contrasts the information gathered from both secondary and primary data in order to approach the research problem from a comprehensive perspective. Moreover, the response about the research question will also provide valuable insights to the understanding of the causal relationship between environmental and social conflicts that derive from the informal extractive activities.

5.1. Informal mining and emergence of environmental conflicts

In 2010 the emergence of environmental conflicts was addressed by the State through the implementation of a regulatory framework that sought to promote the formalization of small-scale and artisanal mining. It is so that in the following 3 years the public sector enacted a wealth of legal devices focused on eradicating informal and illegal mining. This State behaviour is what Bebbington (2012) recognizes as the institutional change of the public sector to face environmental problems. Moreover, the fieldwork proved that the nature of these conflicts in the region come from struggles between State and miners for the definition of parameters of command and control over mining concessions (Arellano-Yanguas 2012). In this regard, even though the contribution of gold mining to the economic development of the region is undeniable, the environmental damages caused by this informal sector are also obvious. The rent-seeking behaviour of the informal extractive activities prioritizes capital accumulation over environmental protection (Clichevsky 2000). Thus, through the formalization of gold mining the State is not only facing an environmental problem, but it is also modifying the economic structures of the region, which might lead to social conflicts.

With the tightening of the actions taken by the State to promote the process of formalization, most of the semi-mechanized extractive methods, as well

as mining in every zone that compromises watercourses were banned. The total of interviewed miners argued that the main problem of the formalization process is that the legislation prohibits the mining in alluvial soils and the employment of suction machines, a situation that leave them without major options for working in the area. Under this context it can be noticed that the emergence of environmental and social conflicts was influenced by State actions. Thereby, the observations and the interviews during fieldwork show that such conflicts complement each other. Even more, for the case of Madre de Dios environmental problems lead to social conflicts. This is a theoretical gap that has not been explicitly considered by the debates about the effects of following a natural resource-led development model (Bebbington 2012, Orihuela and Thorp 2012). In this sense, this research deepens in such debates by understanding the relationship between environmental problems and the emergence of social conflicts as a dynamic phenomenon. This is reinforced by the fact that the continuity of extractive activities in the region indicate that the solution to environmental conflicts carried out by the public sector are aimed to fail. The 'realpolitik' employed for Bebbington (2008) to understand the complexity of the interactions between State, society and economy seems to take shape in the regulatory framework implemented by the Peruvian State to formalize small-scale and artisanal miners. It is so that without comprehensive policy alternatives, the environmental problems will cause by default social conflicts.

In 2012, the State ended modelling its behaviour regarding small-scale and artisanal mining. With the Decree-Law No. 1100, the conceptualization of illegal mining was introduced and the actions against it were regulated, i.e. the illegal mining was criminalized. Moreover, a specific area informally known as the 'mining corridor' was established, a legal action that could be understood as a shielding to avoid unfilled gaps. In this sense, the public sector designed a toolbox to fight against the materialization of the environmental depletion which is illegal mining. As a response to these actions, the miners requested for a reconceptualization of informality and illegality, since with all the prohibitions even the miners that operate in the 'mining corridor' were illegal. The response of the State was the enactment of complementary regulations to set the differences between both concepts. Nonetheless, although several amendments were made the final product was always the same, all the miners that do not comply with the requirements established in the Law are considered illegal unless they are involved in a formalization process and operate in the 'mining corridor' (Poder Ejecutivo, República del Perú 2012). Under this scenario there was no other option for the miners than the fulfilment of the requirements for formalization.

Overall, the institutional change of the State materialized in a number of legal barriers to stop environmental problems lead to the emergence of social conflicts. The latter are rooted in the informal miners, the ones that are considered by the public sector the main cause of environmental depletion. Observations and interviews conducted to both public actors and civil society corroborate that mining continues to wreak havoc on the environment, to the point that deforestation, contamination and collateral damages for the society are increasing. For the miners 'the cure was worse than the disease, now the

State has turned the informality in illegality with its regulations, the issue of illegality and informality is an euphemism¹⁶.

5.2. The real deal: How does the State's behavior influence the causal relationship between small-scale and artisanal mining and environmental depletion in Madre de Dios?

Mining in Madre de Dios has gained prominence for decades becoming the engine of economic growth. The positive impact of mining has been such that there is no public actor capable to introduce alternative development proposals. As a consequence it has been institutionalized an economic and social network that depends directly on the gold commercialization, which is reflected in emergence of social and environmental conflicts (Bebbington 2012). Thus, contrary to most regions of the country where mining activities are taken place, Madre de Dios represents a paradigm case. The informality promoted by the State affects not only mining, but also a large percentage of economic activities that are derived from it (Portes and Castells 1989). This situation complicated further possible policy options that are developed to address the environmental issues of the region.

Throughout the analysis it has been emphasized that the State's actions, regarding its developmental strategy, are been focused on the attainment of economic goals above social, political and environmental dimensions. This behaviour has been historically influenced by a weak institutional structure characterized by the lack of legitimacy (Torvik and Robinson 2006, Ross 2009). Even if the country was under an authoritarian or a democratic regime, the Peruvian policy of development was always directly related to the promotion of extractive activities. It is so that the process of informalization has been historically exogenous (Portes and Schauffler 1994). In this sense, the State regardless of its nature propelled the informalization in order to pursue a natural resource-led developmental path. Particularly, Made de Dios has been affected by this public sector's behaviour since early last century, when it became clear the public interest to populate the forest to extract natural resources (Pachas 2010). What at first was the extraction of raw material became gold mining. Factors such as the rising price of minerals and the complacency of the public sector regarding the market dynamics that were operating in the region, influenced in the current environmental situation of Madre de Dios. Thus, the State has led to the institutionalization of the extractive behaviour of the informal miners through the design and implementation of a regulatory framework that sought to ensure the continuance of a developmental model based on the natural resource extraction (Bebbington et al. 2009, Arellano-Yanguas 2012).

Moreover, responding to the needs of a natural resource-led development model under the premises of the market economy, the State promoted migration in order to increase the hand labour (Portes 1985, Roberts 1989). Indefectibly this action affected the societal structure of the original inhabitants of

¹⁶ Interview with Carlos Bustamante from FEDEMIN (14 August 2014).

the jungle that used to live in indigenous communities. This situation set the stage for the construction of a multicultural society characterized by having a high percentage of migrants from rural Andean areas. Under the logic of producing to survive, the worldview of the new settlers of Madre de Dios was built based on a peasant economic system (Lacey 2002). Through the enactment of regulations the State was modelling informal economies whose perspective on natural resources was purely mercantilist (Portes and Schauffler 1994). So when the State became aware of the environmental damage that was occurring in Madre de Dios it was too late, opting to tackle the problem with regulatory measures that did not meet the economic and social needs of the region.

Thereby it is possible to catalogue the Law of formalization of small-scale and artisanal mining as an isolated strategy to remediate the environmental depletion in Madre de Dios. The analyses of the regulatory evolution as well as the economic and social dimensions of the region showed that the State has not designed a comprehensive policy able to address the problem. In contrast, a policy that attacks the effect but not the cause of problems was designed and implemented, having as a consequence negative impacts in the social structures (Guha-Khasnobi et al. 2007, Bannon and Collier 2003). Measures ranging from the reconceptualization of informal and illegal, to the lack of parameters for mining in jungle areas denote a weak policy making capacity in the public sector.

In general, the historical behaviour of the State regarding the development of Madre de Dios indicates that there is a causal relationship between the promotion of extractive activities and the construction of a complex environmental and social scenario in the region. Both, the importance of mining to the local economy as State failures to address environmental conflicts, have led to an inadequate management of natural resources (Guha-Khasnobi et al. 2007). In this sense, the analysis of the secondary and primary data allows identifying two differentiated stages in the State's behaviour to understand its influence in the causal relationship between small-scale and artisanal mining and environmental depletion. The first one puts the market economy over natural resources, while the other prioritizes natural resources over market economy. In both stages the institutional change of the public sector leads on one side to the informalization of mining, and on the other to the emergence of environmental and social conflicts respectively.

During the first stage comprising all State actions until the enactment of the formalization law, the public sector modelled the informal behaviour of miners. When prioritizing gold mining over an adequate management of natural resources, the State not only sought to increase the incomes derived from the extractive industries, but also institutionalized the mercantilist behaviour of the informal sector (Kanbur 2009). Moreover, by legitimating mining and not regulating the social and environmental impacts of this activity, the public sector reinforced the natural resource-led development model (Bebbington et al. 2009). In this sense, it can be argued that the economic dynamics of a developmental regime based on the extraction of natural resources prioritizes the market economy principles over environmental protection. This perspective reconfigures the essence of what truly is the role of the State. Thus, the Peruvian State for decades developed policies that sought to exploit the maximum amount of natural resources for the economic development of the country.

However, a series of political events and international commitments propitiated that State policies, since the late 1990s, consider the inclusion of environmental criteria in its design. The case of the implementing regulation of the formalization of small-scale and artisanal mining in Madre de Dios meant a major institutional change of the State. In this regard, the protection of natural resources became the protagonists of the State actions, to the point that many regulatory instruments were developed to stop mining in the region. Thereby in the second stage, the institutional change of the public sector responded to an environmental problematic (Bebbington 2012).

From 2010 onwards, the national panorama regarding mining activities was changing, due to both internal and external variables. Thus, the environmental protection of Madre de Dios became a policy priority for the state. Although the influence of mining activities in the country's economy remained representative, environmental problems were already evident. The response to this situation was channelled through policy packages that contrary to the previous period prioritize an adequate command and control over natural resources (Orihuela and Thorp 2012). In this sense, the State developed a regulatory framework on the basis of the fight against informal mining. Leaving aside the possibility of developing a comprehensive policy capable to take into account social and economic aspects, the process of policy making applied by the public sector was focused in the protection of the environment at all costs. As a consequence, the effects of these public actions propitiated social conflicts that seek to maintain the extractive status quo of the region.

In both periods it is possible to identify the institutional change of the State based on the contextual needs of the country. At first there was a public need to maintain the economic stability of the country which resulted in increased support for the extractive industries. After this period, the public sector faced the need of developing policies to reverse the externalities caused by the initial actions. Nonetheless, the institutional changes of the State that on the one hand led to the informalization and on the other to the emergence of conflicts were always influenced by the competitive dynamics of the market economy. Thereby, the small-scale and artisanal gold mining become the main cause of environmental depletion in Madre de Dios as a consequence of the historical regulatory behaviour of the Peruvian State in regards to the promotion of extractive economic activities. I.e. by seeking to ensure the sustainability of a natural resource-led development model under the competitive dynamics of the market economy, the public sector institutionalized for decades the harmful practices of the informal mining for the environment.

5.3. Contribution to the research's theoretical debates

The findings discussed in the first two sections of this chapter have reinforced the fact that the complexity of the research problem demanded the elaboration of an analytical framework from two different theoretical perspectives. This, in the sense that environmental depletion is caused by an informal sector which in turn is directly related to an economic activity that underpins the development of the country. Thus, the synergies of both theoretical debates allowed identifying the influence of the state both in determining development policies based on the extraction of natural resources, as well as in the competitive mar-

ket dynamics between formal and informal sectors. Thereby, the research has contributed to both perspectives by providing a new interpretation of the causal relationship between the role of the state and the emergence of environmental conflicts produced by informal economies.

Furthermore, the causal emphasis put in the relationships presented in the analytical framework sought to link the State's role in determining two phenomena, such as informal economies and natural resource-led development, which in turn converge in the emergence of environmental conflicts. This latter even more complex phenomenon materializes in one analytical gap that can be found in both theories. In this sense the theoretical debates do not delve into the causal relationship between informal sector and environmental depletion, by treating it as a collateral effect of the interplay dynamics between state and market. Moreover, the case of Madre de Dios allows identifying that there is also a causal relationship between environment and social conflicts. This leaves the door open to further academic research about the effects of environmental depletion in the economic and social structures of the region.

In general, the research findings as well as its contribution to the understanding of emergence of environmental conflicts highlight the non-static nature of environmental problems. This dynamism denoted the need to address the research problem from different theoretical perspectives. It is so that in the same manner the inefficiency of the public policies developed to address environmental concerns demonstrates the lack of a holistic view of the subject by policy makers. Therefore, the research contributes to both theoretical and practical debates concerning the emergence and remediation of environmental problems.

Conclusion: A foretold environmental catastrophe?

We must move forward, even stepping on corns. To make tortillas you have to break eggs.

- Ollanta Humala

Throughout the analysis of the situation of gold mining in Madre de Dios it was possible to identify the State's influence in the behaviour of informal miners regarding the environment. In order to develop this perspective it was necessary to build an analytical framework that considers the dynamic nature of environmental problems. It is so, that three key concepts were taken from the theoretical debates about informal economy and development and mining. On the one hand, the structuralist approach of the informal economy allowed framing the analysis of the informalization process of small-scale and artisanal mining. While on the other hand the debates about the relationship between mining and development led to understand the natural resource-led development model followed by the State. Even more, this helped to identify the cause-effect relationship between the emergence of environmental and social conflicts and the institutional change of the State.

Under the mentioned considerations, the answer to the main research question about how does the State's behaviour influence the causal relationship between small-scale and artisanal mining and environmental depletion in Madre de Dios? was built from the conclusive remarks of the three research sub-questions. This implied to look into the interrelation among stakeholders involved in mining activities in the region, from the public and private sectors as well as from the civil society. Even more, through the identification of political, social, economic and environmental dimensions the analysis was oriented to fill possible gaps during the research process. In this regard, the literature review showed that the understanding of the emergence of environmental conflicts should be interpreted taking into account the historical context in which it develops as well as its dynamic nature. Whereby, the research strategy sought to approach the role of small-scale and artisanal mining in environmental depletion from a holistic perspective.

Moreover, the findings collected from the analysis of the primary and secondary data were employed to interpret the causal relationships established in the analytical framework. Regarding the informalization process of small-scale and artisanal mining, it was noticed that it was promoted by the State responding to the competitive dynamics of the market economy. Understanding that the latter unfold in a scenario characterized by the interactions between formal and informal economies implies that the State plays a regulatory role that is intrinsically related to its developmental path. It is so that through different regulatory mechanisms, the public sector institutionalized an informal behavioural pattern on miners in Madre de Dios. Thus, the informalization process meant the embeddedness of the market dynamics in the small-scale and artisanal mining, which translated in the inception of informal mining. This process was reinforced by the State over the years, independently of the political system of the government. Both, democratic and authoritarian regimes expressly recognized through regulation the importance of mining for the eco-

nomic development of the country. Nonetheless, in the last five years, the public sector enacted a set of regulations that put informal mining as the main cause of the environmental depletion.

The fact that informal mining was considered the main cause of environmental depletion reflected the institutional change of the State with respect to the promotion of extractive economic activities in Madre de Dios. Even though the natural resource-led development model remains the main instrument of the public sector to maintain the economic growth of the country, it seems that the public sector seeks to achieve the golden mean between environmental protection and resource extraction. In this sense, the emergence of social conflicts responded to the attempts of the State to implement a formalization policy of small-scale and artisanal mining that implicitly bans mining in Madre de Dios. So, it is possible to argue that for the case of informal mining, there is a clear relationship between environmental depletion and the emergence of social conflicts.

The information gathered indicates that there were no social conflicts in the region until 2010, when the State began to take real steps to halt deforestation and loss of biodiversity. Even more, the analysis of the mining legislation indicates that environmental issues were not a concern for the public sector until 2010, when the State declared of national interest the mining system in the department of Madre de Dios (Poder Ejecutivo, República del Perú 2010). Thus, there are two stages with different behaviours by the State in relation to gold mining in Madre de Dios. The first can be summarized in the process of informalization that apart of promoting market dynamics, also favoured the emergence of environmental problems. The second began in 2010 and seeks to remedy the negative environmental impacts of mining without losing the natural resource-led developmental path. In this sense, the response to the emergence of environmental problems in Madre de Dios is directly related to the establishment of a developmental model based on the extraction of natural resources.

As it can be noticed along the analysis, the institutional change of the State at different stages responded to the economic context in which it was located. It is so that both, the sustained economic growth of the country in the last years and the economic recessions have been always linked with the fluctuation of the price of minerals in the international market. Since the State's actions against informal and illegal mining radicalized, the economy of Madre de Dios entered in a period of recession that supported the inception of social problems. Until 2009 more than 60% of GDP in the region came from mining, with the new regulations this percentage was decreasing and consequently other economic sectors were affected (Valencia 2014). The State's response to this situation was the increase of the public budget of the region, in order to encourage the development of alternative economic activities to mining. However two factors prevented the proper execution of public spending. On one hand, interventions against illegal gold mining demanded greater resources, and on the other, there was a shortage of administrative capacity in the regional government, due to the transference of responsibilities from the central government, under the process of decentralization. The combination of these variables complicated the implementation of a solution to the economic recession that was plunging the region.

In sum, clear indicators of the State behaviour regarding small-scale and artisanal mining, materialized in the command of the informalization process and in the enactment of regulatory mechanisms to remediate the environmental conflicts in Madre de Dios, have been presented and analysed in the research. The concluding remarks of this interpretation allowed approaching the research problem by looking into the interrelation between institutional change, informalization and conflicts. In general, the three concepts are causally related according to the historical context in which were analysed. Thereby, the institutional change that at a first stage led to the informalization of mining, at a second stage led to the remediation of environmental degradation that exogenously propitiate the emergence of social conflicts. Thus, the harmful behaviour of miners in relation to the environment was shaped by State regulations that encouraged natural resource extraction, obeying to the competitive dynamics of the market economy. In this sense, the answer to the main research question puts the role of the State as the root of environmental problems in Madre de Dios, a situation that leaves the door open to rethink if the current environmental scenario in the region was not a foretold catastrophe?

Appendices

Appendix 1 Actors interviewed per sector

Sector	Interviewee	Institution and position	Interview date
State	Humberto Cordero	MINAM – Regional coordinator	12 August 2014
	Guimo Loaiza	Ombudsman office - Regional coordinator	12 August 2014
	Mario Tapia	GOREMAD - Director of economic development	13 August 2014
	Junior Orrego	GOREMAD - Analyst of the Direction of energy and mines	13 August 2014
	Maribel Sánchez	OEFA - Regional coordinator	13 August 2014
Mining	Alex Condori	FEDEMIN - President	14 August 2014
	Carlos Bustamante	FEDEMIN – Technical advisor	14 August 2014
	Luis Otsuka	FEDEMIN – Former President	16 August 2014
	Julio Luna	FEDEMIN	16 August 2014
	Miner	FEDEMIN	16 August 2014
Civil Society	Victor Pachas	CRS - Project manager South American zone	27 July 2014
	Vidal Salazar	FADEMAD - President	14 August 2014
	Juan Navarro	Caritas – Project manager Madre de Dios	17 August 2014
	Luisa Ríos	SPDA – Regional coordinator	18 August 2014
	Yessenia Apaza	ACCA – Technical advisor	18 August 2014

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