

Mining water governance:

Everyday community-mine relationships in the Peruvian Andes

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**Mining water governance:
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Milagros Sosa Landeo

Thesis

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Chapter 1. Introduction



Halansiri Lagoon, Apurímac. Photo: M. Sosa.

1.1 Problem statement: Water governance as everyday politics

“What would you do... sell your land to get benefits from the mine? Or keep your land to leave to your children as their inheritance?”,

“What to do... we want water but also jobs” ..., “and if we believe the [miners]...do you think they will keep their promises?”

These are statements by farmers in rural communities in Peru’s Cajamarca and Apurímac regions in the Andes about their experiences living with large-scale mining companies. They reflect the dilemmas and ambivalences they face when the subsoil under their territories has been given as concessions to large-scale mining companies. Many community members welcome the new opportunities for jobs and earning incomes that mining companies may offer. They are also glad about how mining companies re-invest part of their profits in their area of operations: schools, hospitals, roads, etc. get constructed thanks to their contributions. Yet, they are often much less positive about the significant losses of access and rights to land and water that mining operations produce, as well as of their reduced autonomy to make decisions about these resources. Living with a mining company as a new neighbour is challenging: the presence of mines alters waterscapes and territories in ways that are both unexpected and difficult to resist or influence, as mining companies have much more economic and legal power than communities. In this thesis, communities are considered as groups of rural or small-scale farmer families sharing particular socio, economic, cultural and territorial commonalities, and being similarly affected and influenced by the presence of mining companies. Yet, communities are also marked by differences in power, race, class, gender and beliefs, while community members may also react differently to the changes provoked by mining activities – depending on positions, interests, and affiliations and royalties. Some communities importantly differ between each other depending on their political-legal status: where some are recognized by the state as *“comunidades campesinas”*, others are not or are only starting legal recognition processes.

This thesis presents an in-depth portrayal and analysis of how communities and mining companies navigate these challenges, focusing in particular on those related to water. It documents community members' efforts to continue to access, manage and control the water that they need for their livelihoods, the same water that mining companies need and claim for their operations. Yet, while thus competing for water with the mining company, communities members also often want to get '*the best from the bad*' and pro-actively approach companies for employment opportunities or with requests to invest in development projects for their localities. This double bind - of wanting to benefit from and thus becoming dependent on, while at the same time being threatened by mining companies - is what fundamentally characterizes community-mine relations. Community members may combine efforts to resist the company's appropriation of water resources with strategies to befriend the mining company in order to obtain jobs or other benefits, or choose one of the two strategies. For many of them, living with mines consists of sometimes paradoxical combinations of resistance, struggle, negotiations or the forging of alliances, with community members as well as mining company representatives tactically shifting positions depending on the context as well as on how long and well they know each other.

In Peru, the state has pro-actively promoted and welcomed mining investments, particularly since the 1990s. In many instances, community-mine interactions have resulted in conflicts. In some cases these have led to the abandoning of mining plans altogether, some examples are the Mount Quilish and Conga in Cajamarca. Also in Tambogrande, Piura, the outcome of a local referendum was that communities should be allowed to continue farming in the area, thereby stopping large-scale mining interventions in the region (Muradian et al. 2003, McGee 2009). Many other community-mine interactions instead ended in sometimes long-winded negotiations, occasionally through round-tables specifically designed for the purpose. Espinar, Cusco (see de Echave et al. 2009a, Dominguez 2010) is an example here. Round-table negotiations have helped channel complaints, and facilitated the design of solutions that allowed farmers to continue practicing small-scale agriculture in spite of the presence of mining operations.

Most accounts of community-mining interactions are done against a desired outcome. Hence, those identifying with social or environmental justice movements tend to describe them in terms of the relative success of resistance to mining operations, and consider attempts to reconcile conflicts between companies and communities as necessarily suspect, signifying co-optation of the communities by the mines and the state. Those identifying with a government perspective instead consider conflict and resistance as signs of unwanted trouble; a hindrance to the supposed progress that mining development generates. Rather than as expressions of discontent, state officials may interpret community opposition to mining operations as ways to blackmail companies for (more) benefits: *"People do not want water, they want money"*, and *"when communities impacted by mining negotiate with companies, they think they are rubbing Aladdin's lamp"*. Third parties such as NGOs may describe conflicts in view of identifying possible ways to technically or legally resolve them, or to propose processes of mediation or re-conciliation.

In this thesis, I make an explicit attempt to portray the interactions between mining companies and communities in a less teleological manner. My starting point is an explicit acknowledgment of the fact that these interactions are characterized by messy politics: they consist of struggles, negotiations and compromises that are always provisional. They reflect the paradoxes that emerge when parties try living together in a mutually dependent but very unequal relationship. By shaking off the temptation to romanticize indigenous communities as environmental protectors, and by remaining sceptical about providential techno-fixes as solutions to the socio-environmental problems caused by mining development, this thesis thus analyzes community-mine interactions as embedded in forced relations between very unequally positioned partners.

By embracing the messiness of situational processes and relations, my ambition is to not only describe the social and environmental changes provoked by mining operations, but also to shed light on how everyday water politics play out in contentious mining contexts. By doing this, I aim to contribute to a newly emerging field of practice-based water governance studies and theorizations.

1.2 Research design

1.2.1 Research objective and research questions

This thesis sets out to understand what happens with water in contexts of mineral extraction, by looking at how and by whom water is accessed, controlled and governed. By focusing on their inherently situated, complex and power-laden character, I describe the messy processes of water politics in mining contexts to shed light on how mining reconfigures water governance arrangements. This, in turn, allows me to contribute to practice-based theorizations of water governance.

The research develops around the following research question:

How does water governance evolve in contexts of large mining operations in the Peruvian Andes?

I have approached this question as consisting of two broad and interconnected themes. The first is about *control over resources*: the (legal and less legal) ways of accessing water and making decisions about it. The second is about *representation*: ways of knowing and speaking for water, linked to relations of accountability. In mining contexts, both are inherently contested, yet some mechanisms of control and some forms of representation are (considered) more legitimate than others or carry greater weight.

1.2.2 Navigating roles and positions: Research sites and methods

Research sites. For this thesis, two regions of Peru were selected as fieldwork sites for case studies: Cajamarca and Apurímac (see Figure 1). To “follow the mines”, I selected those areas because they have high records of discontent associated with mining investments. My consideration was that conflicts over water would provide a useful entry point for beginning to trace and identify opinions, actors, interests and positions and thus for starting to unravel how water and its access and control is arranged and contested.

Cajamarca and Apurímac are the two regions with the highest number of socio-environmental conflicts in Peru over the last five years. It is no coincidence that these are also among the regions with the highest concentration of large mining investments (Apurímac, Arequipa and Cajamarca). Apurímac and Cajamarca have been the main

destinations for mining investment during the last fifteen years. Cajamarca is a region with a long history of struggles, disagreements and conflicts between the Yanacocha gold mine and the urban and rural areas surrounding its operations. In Apurímac, even though levels of contention appear lower than in Cajamarca, many frictions did emerge when mining concessions had just been granted and the project was still in the exploration phase (Gouley 2005, de Echave et al. 2009a, de Echave 2014). These simmering dissatisfactions provided for a fertile ground for protest to erupt as soon as operations began in the Las Bambas mine in Apurímac.

Chronologically, I started this research by visiting Cajamarca, looking at a mining company that had been operating for over fifteen years in the area. In comparison with Apurímac, what is interesting is that Cajamarca's mining history dates from before colonial times (O' Phelan Godoy 1993, Pérez Mundaca 2010)

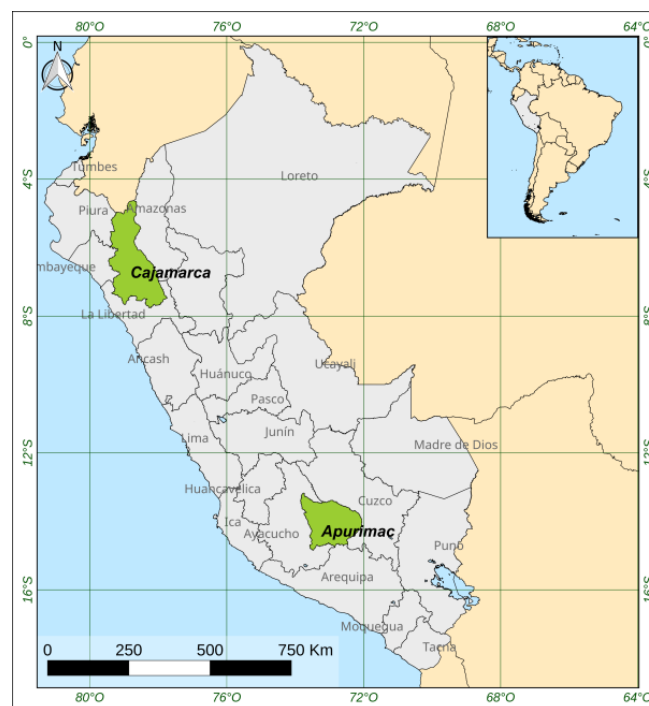


Figure 1. Location of the main research sites in Peru. Source: adapted by C. Cerdán.

Doing research on contentious issues. Doing research in such conflict-ridden areas on precisely the theme that is the topic of contention comes with challenges and difficulties. The collection of information is inevitably coloured by the strong emotions and opinions that characterize the conflict. Particularly at the start of the research,

communities' attitudes – while being mostly open, warm, and friendly – towards non-local researchers (even if Peruvian) can easily turn into distrust. This is testimony of the research topic's extreme political sensitivity: the topic lies at the heart of strongly polarized opinions among and even within families as well as between community members and others about the transformations that mining provokes.

This influenced my research in at least three ways. For one, I became deeply aware about how ways of knowing and understanding water and its governance are always deeply entangled with normative and political ideas about how it should be governed and managed. To some extent I learned to unravel such entanglements, and also came to understand the importance of making my own position and opinions explicit. I also became aware of how it is impossible to study community-mining interactions without somehow getting involved and (being seen as) taking a position. Being trained as a biologist – ecologist, this was new to me. I had learnt to subtract myself from the subject being studied, as a way to remain as objective and neutral as possible. Now, I came to understand how a researcher is always part of and therefore influences the world she studies (Burawoy 1998, Billo and Hiemstra 2013).

Yet, and this is the second implication of doing research in a politically charged environment, I had to express my opinions with caution if I wanted to be able to talk to all involved actors. It was impossible not to feel and experience the tension that marked the overall atmosphere in my research areas. I was for instance regularly confronted with company security guards who blocked public roads to check for IDs and credentials. During field work, I was constantly 'accompanied' by someone – supposedly a security guard from the mining company - who followed and observed me from a distance. Sometimes, farmer fieldwork collaborators preferred to send me alone to walk along some parts of the irrigation canals, because these were located in contested areas. On one occasion, angry farmers in Cajamarca with axes in their hands kicked out an official state monitoring group that I was following, saying *"I don't bother you in your offices, so don't bother me here at my house"*. I could give many more examples of how I became mixed up in the game of watching and being watched that is an

important element of how mining companies and communities interact with each other (see Figure 2).



Figure 2. Researcher during fieldwork. Front page of local newspaper reporting the mobilization of farmers from Combayo. Source: El Mercurio, Cajamarca, December 2010.

Very similar to how communities and mining companies navigated their sometimes contradictory positions and interests, I also was forced to learn how to navigate my alliances and position. While I clearly had greatest sympathy for those who stood to lose or were losing their access to and control over water – members of the communities –, I needed to express this sympathy with caution so as not to lose the possibility to also meet with and learn from the ideas and perspectives of the mining company and state representatives. I sometimes also had to give up on research plans. This for instance happened with the water-quality sampling that I had wanted to do, to understand the influence of mining on the quality of the water in creeks and rivers that communities use. Besides technical challenges of preserving the samples until their delivery to the lab, it proved challenging to get the necessary permissions. Not

only were the permissions from the mining company needed to enter the different sites almost impossible to get, but also the communities themselves were not so keen for studies to happen in their areas. Both mistrusted this activity and were suspicious about what would happen with the findings. This is why, early on in the field work, I decided not to sample water quality. I did help conduct water-quantity assessments for the Chonta Water Users' Association in Cajamarca (JURCH), to determine water availability in the hydraulic networks and in the watershed (CEDEPAS 2009).

In a similar way, it proved challenging to conduct questionnaires. When I tried doing it, many community members whom I had had friendly conversations with earlier became reluctant to participate. One of them, "*for more security*", sent me first to the governor of the town. The governor explained to me that people in the area are suspicious about what can happen when they help with forms or questionnaires, because questionnaires and forms were also used by mining companies prior to exploration and extraction. The company used these to get permission from the farmers to start their operations, often without the latter realizing this. By sending me to the governor, farmers hoped to receive some assurance about the purpose of my activities in the area, proving in particular that I did not have anything to do with the mining companies.

The third implication of studying a conflictive issue is that it required time and energy to establish the trust needed to have meaningful conversations and interviews. I needed to continuously re-establish my own trustworthiness, against suspicions and allegations that I was a spy. Once, in Tambobamba, Apurímac, close to the area of the Las Bambas mine, I attended an event organized by CooperAccion, a national NGO working on topics of mining, natural resources and local development¹. Some consider this an anti-mine organization. The event was about natural resources and mining in Las Bambas and gathered different actors from the area, including farmer leaders, local authorities, NGOs, and representatives of the mining company Xstrata. At some point during the meeting, a leader from Fuerabamba (a community that was working closely with the mining managers), asked the organizers: *Why are you sending students to spy*

¹ See <http://cooperaccion.org.pe/main/index.php>

on the communities, saying that they are from foreign universities when they are actually working for anti-mine organizations? The organizers replied ... "I think this question is for you, Milagros, come to the front and give an answer". Incidences like this happened several times. Similarly, I was often questioned about my roles and affiliations with public organizations in Cajamarca, with farmers trying to establish my trustworthiness and wanting to know if I was there to somehow support them and the communities in their struggle against the mining company or just another one of those visitors who do nothing for people's struggles, meaning state officials.

Methods. Within the two regions, snowball methods (Ranjit 2011) were used to select particular incidences or manifestations of socio-environmental conflict. In Cajamarca, I selected one ongoing water dispute as well as a past socio-environmental conflicts as entry-points for my investigation. I traced the main features of the disputes, the strategies used and actions displayed by various actors, focusing on laying bare how water governance arrangements evolved, were negotiated or contested (see Chapters 3, 4 and 5). In Apurímac, interactions between communities and the ongoing Las Bambas mining project were taken as events to analyse how water-governance arrangements are negotiated or contested when mining is not yet operating and how, at that stage, mining influences local water institutions (see Chapter 2).

The actual fieldwork consisted of repeated visits to several Andean communities in Cajamarca and Apurímac, during a period of two years (from 2009 to 2011). I complemented this with interviews with state officials in Lima during 2012 and 2015 with a follow-up in 2016. In total, I visited about twenty communities. In Cajamarca, I had dual residence, as do many farmers in the area: I had a place to stay in the city of Cajamarca and at the same time I rented a room in the rural town of Combayo. This allowed me to visit and interview government officials during work-days in Cajamarca, whereas I often stayed in Combayo during the weekends (from Friday to early Monday) to visit and interact with farmers, or interview them during the Sunday farmer's market. I also often met with leaders when they visited state offices such as the *Defensoría del Pueblo* and *ALA Cajamarca*.

In Apurímac, I chose to rent a room in the district of Challhuahuacho, and access communities from there. In this case, I relied on the help of Daniel Luna as a field assistant and translator (from Quechua to Spanish). Farmers were mostly visited at their homes and in their fields, but also at the open-air market, carnival festivities and during meetings such as community assemblies, forums or presentations.

A main method for gathering information was semi-structured informal interviews. About 126 interviews were conducted, with some key actors who were interviewed on more than one occasion (see List of Interviews in Appendix 1). My interviewees included farmers, government officials at local, regional and national level, representatives of local NGOs and civil-society groups, researchers, and mining-sector representatives. Interviewees' names have been omitted in the chapters; only when they are explicitly mentioned are the names of persons, organizations and places real. Research activities were expanded after the fieldwork, following developments at research sites via information from email communications with key informants, as well as by gathering news from regional, national and international media. In addition to interviews, I also made use of questionnaires and group discussions, methods that I combined while using case-studies of particular conflicts. Case-studies make it possible to examine a phenomenon within defined perimeters of place and time (Ranjit 2011, Gartner 2014). They allow to extract the general from the unique and to move from the "micro" to the "macro" (Burawoy 1998). While going deeper into the case studies, I used oral histories to unravel how particular water governance arrangements had evolved, according to the different perceptions and experiences of people involved in them, or to reconstruct events as seen through the eyes of different actors.

In addition to these methods, I engaged in participant observation and action-types of research. By staying in rural communities and living with community members, I became a participant observer (Crang and Cook 1995, Burawoy 1998), allowing me to form an understanding of interests, relations, and interactions between communities, mining company representatives, state officials and other actors interacting within and beyond communities' borders. I alternated between a role as an observer, a photographer and sometimes a secretary, taking notes for community-assemblies'

minutes. I took walks along canals, or wandered into the few remaining areas not yet owned by the mining company, accompanying farmers during their *rondas* and *mingas*. I also attended cattle markets and community assemblies, and participated in public demonstrations. Here, the fact that I was born in the Andes (Huancayo) helped in creating rapport with farmer families. Sharing the same Andean identity made it easier to connect and engage in conversations, and establish trust. In this way, I became a friendly companion of several farmers, supporting them in their daily activities and struggles. I also accompanied some of them during judicial hearings. Just before one final trial, I received a message on my phone: *"We fear the worst, could you maybe talk to your acquaintances – lawyers – and see if they can help us?"* I of course went, even though I felt powerless and unable to help. Yet, I hoped – as they were – for good news and not punishments of 30 years in prison. Fortunately, in this case the farmers were absolved by the jury.

Also in other ways, I sometimes became more deeply involved as an action-researcher. For instance, to start my field work and gain entry into the communities, I used contacts from the WALIR Water Law and Indigenous Rights course² to approach CEDEPAS, a local NGO working with agriculture, irrigation and farmer production in Cajamarca. They asked me to help with the water-management plan that they were developing for the water-user association of the Chonta River in Cajamarca. This work got me out in the field, and I became familiar with the communities of the high, middle and low areas of the Chonta watershed, all within the Yanacocha gold mine's area of influence.

Once I had settled in Cajamarca, I approached Grufides, a local NGO working in the area that gives legal advice to rural communities and helps them improve their farming activities.³ The Yanacocha mining company considers this NGO as anti-mine, because it has been critical of the company's actions and behaviours since mining operations began in the area. I decided to visit the NGO and tried to make

² WALIR was an international alliance coordinated by the Water Resources Management group at Wageningen University and the United Nations (2001 – 2008). It is now followed up by the Justicia Hídrica - Water Justice Alliance.

³ Grupo de Formación e Intervención para el Desarrollo Sostenible, see: <http://grufides.org>

appointments with its staff. They asked me for some official credentials and gave me access to their library and some email addresses to make appointments. Little by little, I got to know more people from this organization and got the opportunity to interview them. Months after my first arrival, in subsequent fieldwork visits, I offered myself as a volunteer, working together with some of their staff and receiving useful feedback on my findings. Yet, it took time to get to this situation, because – as I found out some years later – at the beginning some of their staff assumed I was a spy, thinking that my research was paid for by the mining company. I can understand their suspicion or mistrust, particularly considering that the NGO's staff had received, some years ago, death threats and been subjected to surveillance by the Yanacocha mine's security company.⁴

As a further way to gain entrance into the communities and obtain insights into contested water issues, I did some volunteer work for the Ombudsman's office of Cajamarca. This is why some farmers saw and approached me as a lawyer, I conveyed the questions and concerns from communities to the Ombudsman Office and, together with the responsible lawyers, provided the communities with advice on how to engage with the mining company and the government authorities. This role was much appreciated, and community leaders also started approaching me to accompany them when visiting for example the Local Water Authority and talking with the directors. My presence, they felt, would lend legitimacy and authority to their complaints and requests.

For the fieldwork in Apurímac, I received support from the Bartolomé de Las Casas Andean Studies Centre (CBC). Going to visit the communities with CBC's representatives helped to get the research started, but the reputation of CBC and CooperAccion as anti-mine proved difficult later on in the study. Once, a school teacher for instance stopped me from entering a meeting already arranged with a community. He shouted: *"you are not a student but a spy and you have nothing to discuss*

⁴ These were documented by Boyd (2010).

here". It was only some days later that I got a chance to meet with the leaders with whom I had made the first appointment.

To get access to the mining companies, the fact that I was studying abroad and the affiliation with a foreign university was particularly useful. Company representatives were always highlighting the fact that researchers should remain neutral. Even though I made no secret of the fact that I did not approve of their actions and behaviours, conversations and discussions were still possible. In Apurímac, and perhaps because of my association with organisations that were seen as anti-mine, I was identified as a threat to mining, bringing anti-mine message to the community. Eventually a letter sent from Wageningen University to the mine manager's office was needed, asking for permission to conduct research work in the area. The letter allowed me to do some interviews, but the mining company remained reluctant to share detailed information. They said that this was because they were in the process of preparing its Environmental Impact Assessment (EIA). According to the mine managers, "*by law we are not authorized to share information before studies are finished.*" On other occasions, company representatives blocked my access to informants or meetings by saying that it was for my own security. They also did not allow me to accompany a water-monitoring team into the mining areas, even though it was participatory monitoring.

1.3 Theorizing water governance: Politics, practices and people

In the chapters that follow this introduction, I present several cases of negotiations, struggles and conflicts between communities and mining companies, which I discuss in the context of more general questions of (the organization of) water control and the representation of water. Chapters 2 through 5 thus already include their own theoretical or conceptual frameworks, which I do not repeat here. When combined, these chapters provide a detailed account of the politics of water in contentious mining contexts. In this way, they provide an interesting and revealing backdrop against which to discuss more general water governance conceptualizations and theories. Here, I provide some of the theoretical sources of inspiration that I mobilize to do this.

Stating that water connects sectors, territories, levels and peoples, the OECD (2015) developed principles, based on effectiveness, efficiency, trust and engagement, to guide countries in governing water. While recognizing that governance is highly context-dependent, the OECD aligns with the Global Water Partnership in defining water governance as “the range of political, social, economic and administrative systems that are in place to develop and manage water resources, and the delivery of water services, at different levels of society” (Global Water Partnership 2002 cited by Rogers and Hall 2003: 7). Both organizations approach water governance as a set of strategic tools to help resolve water challenges and improve water policies, proposing frameworks to enable or support those tasked with water responsibilities to manage and distribute “sufficient water of good quality while maintaining or improving the ecological integrity of water bodies.” (OECD 2015:3).

In this thesis, rather than as a prescriptive toolkit, I define water governance in a more descriptive-analytical sense to refer to political processes around water, entailing debate and asymmetrical interactions between often rival actors (Castro 2007, 2008). Water governance, as Woodhouse and Muller (20016) explain, is “a scene of contestation” in setting priorities, needs and goals (see also Eagleton-Pierce 2014). With Zwarteveen, I thus define water governance as “the practices of coordination and decision making between different actors around contested water distributions” (Zwarteveen 2015: 19). Such practices are thick with politics and culture; they are linked to creative processes of imagining and producing collective water futures, and combine political problems of *scale* (spatial, ecological, administrative, temporal), with problems of *coherence* (the durable alignment of different people and different waters despite problems of commensurability and political tensions) (cf. Bridge and Perreault 2009). This definition emphasizes that governance is not just about the managerial aspects of governing or using nature, but also about the politics involved. It also usefully allows opening up for questioning the extent to which actual governance is an “intentional process”, consisting of purposive actions and interventions to decide on and influence particular outcomes.

I link this definition of governance to broader discussions of governance that use the term to indicate that processes of coordination and decision making happen largely outside of formal government domains or by non-government actors (Rhodes 1996, Buizer et al. 2011, Colebatch 2014).

Instead governing practices are based on negotiations involving a broad range of non-state entities (Colebatch 2009). The implication is that studies of governance need to make the question of who governs, an explicit part of the investigation. Rather than taking for granted what governance is and who is involved, the questions "governance of what, by whom and to what end" (Bridge and Perreault 2009: 477) become important. These are precisely the questions that I engage with in the thesis. I want to use my descriptive analyses to reflect on how access to and control over water are organized, by and for whom, and for what purposes? Such a broad and open-ended definition of governance rests on the recognition of how different political communities –state or non-state entities– employ a suite of “mundane techniques of governance” (Jaffe 2013: 736, Meissner 2014).

I firmly anchor these reflections on water governance in the everyday negotiations, bargaining and conflicts that happen when water becomes even more contested than it normally is because of the presence of a powerful new competitor: a mining company. Extraction, particularly large open-pit mining, profoundly modifies water flows in terms of quantity and quality, while also changing the ways in which it is controlled, coordinated and talked about or known. These modifications all start with the mining company getting access to the subsoil, leading to reconfigurations of activities, spaces, and uses needed for the extraction of ore (Bebbington and Bury 2013, Preciado Jerónimo et al. 2015). At its most fundamental level, these modifications can be interpreted as pitting member of local communities, livelihoods and the long-term conservation of water and water-based ecosystems against mining companies, profits and shorter-term development goals (Bebbington et al. 2010, Bebbington and Bury 2013, Li 2015). Analyses drawing on insights from political ecology thus effectively expose the profoundly unequal power relationships that characterize these interactions (Swyngedouw 2004, Perreault 2013, Budds 2014, Himley 2014, Perreault

2014a, 2014b, Boelens 2015), laying bare the military and economic resources used by mining companies to silence or buy local people (Tanaka et al. 2007, Arana Zegarra 2009, Gil 2009, de Echave et al. 2009b).

While being profoundly inspired by these analyses, this thesis takes a somewhat different approach by focusing more attention on *how* community-mining company relations evolve. Rather than fixing either communities or mining companies in pre-determined positions (e.g. as victims, benefactors, beneficiaries, exploiters), I instead make room for a more emphatic description and analysis of their motivations and aspirations, with explicit recognition of their agency. Here, I take inspiration from an emerging body of ethnographic work on conflicts and community-mine relations and contradictions (see e.g. Horowitz 2012, Babidge 2013, Carrasco Moraga 2014, Dougherty and Olsen 2014, Martínez Silva 2015, Rasch and Köhne 2016), work that uses terms like *micro-politics*, focuses on everyday practices (Long 2001) and everyday politics (Kerkvliet 2009) and that emphasizes how different local people actively influence and shape how resources are used, produced and allocated (Hogenboom 2012). These analyses thus attempt to recognize that although nobody is entirely free to do as she or he wants, people are also not entirely constrained. There should be a middle-ground somewhere, as Gaasbeek (2010) says, that enables them –to a certain degree – to shape their realities. Hence, I attempt to understand people’s capacity to respond not only as resistance, but also as their capacity for action (Mahmood 2001) and reaction in contexts of historical and economic marginalization. Here the thesis coincides with Meissner (2014) in not dismissing the agency and influence of elites, state entities, individuals or communities, but rather to analyse their interactions and the changes in water governance that such interactions might generate.

In recognizing the resilience and creativity of local communities without romanticizing these, I have also greatly benefitted from the studies and discussions done in the contexts of the *Justicia Hídrica* network and the *Concertacion* research project – both Wageningen University initiatives (see e.g. Dominguez 2010, Panfichi and Coronel 2010, Guardia Nogales 2011, Preciado Jerónimo 2011, Sosa and Zwarteveen 2011, Urteaga 2011, Sosa Landeo 2012, Vos and Boelens 2014, Perreault 2014a, Yacoub

López 2015, Stoltenborg and Boelens 2016). All that scholarly work, as well as this thesis, undertakes to unravel scenarios of (un)just water management, identifying and analysing the multiple actors and sectors involved, often using conflicts as an entry point to lay bare the power and politics of governing water (see Boelens et al. 2011, Isch et al. 2012, Yacoub et al. 2015). A particular insight of this body of work is the analysis of actual patterns of water use and rights as part of local, contextualized dynamics, highlighting the embeddedness of water in history and culture (see Trawick 2001, Urteaga and Boelens 2006, Boelens 2008, Lynch 2012, Paerregaard 2013, Boelens 2015)

1.4 Background of the thesis and the research sites

I use this section to provide some background and context to the thesis. I first give a broad-brush overview of mining in Peru, focusing on how mining operations often create conflicts over water. I then zoom in on my two research sites, Cajamarca and Apurímac, providing the context against which the more detailed analyses in the following chapters need to be seen and interpreted.

1.4.1 Peru: Mining, water and conflicts

“Peru is, without any doubt, one of the richest countries in mineral [resources], and it is truly amazing to see these materials’ abundance and variety, disseminated in every region of the Republic”.

(Raimondi 1878 cited in Villacorta Ostolaza 2007: 374)

Peru has been considered a *país minero* (mining country) already for a long time. Towards the end of the 19th century, the prominent natural scientist Antonio Raimondi produced *“Minerales del Perú”*, an exhaustive catalogue of Peru’s minerals. The catalogue was presented at the Paris Universal Exposition in 1878. In representing 652 mineral samples from different regions of Peru, the catalogue showed off the country’s mineral wealth, clearly marking the country as a rich mineral country in the eyes of the rest of the world (Villacorta Ostolaza 2007).

During the last decades, the idea of *Perú país minero* was actively revived by consecutive governments as one of the ways to attract more external investments to

the country. Among others through attractive policy packages (including tax and legal stability contracts (Morón 2007).⁵ Peru has become one of the foremost destinations in the entire Latin American region for international and national investors in mining businesses. From covering nearly 2 million hectares in 1991, mining developments covered more than 27 million hectares in 2013 (see Figure 3) (de Echave 2014). About 15% of the national territory is devoted to mining, with some departments with far over 50% of their territory under concession. Worldwide, Peru is the third-largest producer of silver, copper and zinc; in Latin America, it is the largest in gold production. Investments in the mining sector between 2011 and 2015 were about US 42,076 billion dollars, compared to 11,458 billion dollars in 2006-2010 (SNMPE 2016).

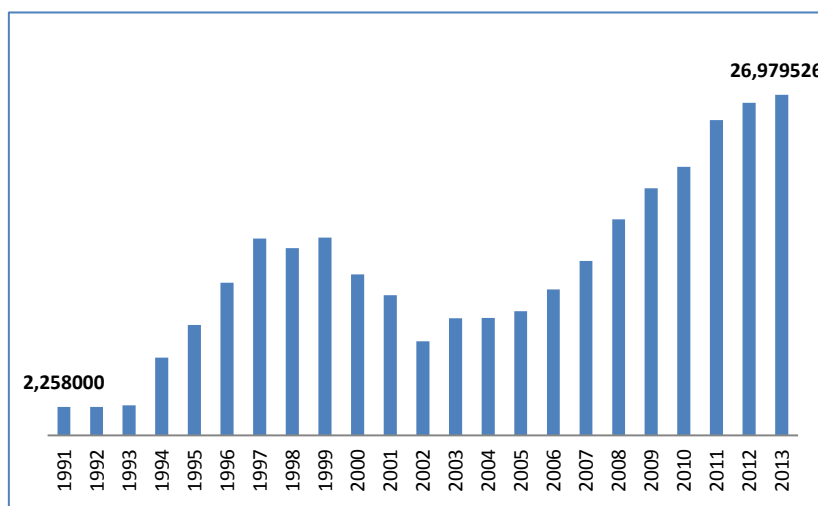


Figure 3. Mining concessions in Peru (1991 - 2013). Source: de Echave (2014)

The active government support to mining development is based on the idea that mining brings prosperity and development. While mining certainly brings money into the country, mining operations also come with many challenges and problems since the concessions are granted by the state. Problems have to do with how the rights to subsoil minerals are allocated, mineral reserves officially are state property and are

⁵ During the 1990s, about 18 legal-stability contracts had been given to several operations from different companies such as Yanacocha, Quellaveco S.A., BHP Billiton Tintaya S.A., Antamina, and Southern Peru Copper Corporation. For example, Yanacocha got 3 tax stability contracts for its mining operations at Maqui Maqui, Carachugo Sur and at Cerro Yanacocha (Morón 2007: 9,10).

given in concessions for exploration or exploitation to mining companies.⁶ Those who own or live on or off the land below where the minerals are located, are not always aware of the concession. The problem is exacerbated when companies also need associated rights – including those that are the focus of this thesis: rights to water. Mainly because of the building of mining camps; the excavation, dismantling, and construction of tailing and leaching platforms; mining developments –often in irrevocable ways– alter the quality and nature of water flows, severely damaging the ecosystems and livelihoods that depend on these (Perreault 2014a). Although there are efforts to plan, mitigate or compensate for such impacts through EIAs, there remain many worries and complaints. Some of these stem from community members' difficulty to understand the technical language used, or the fundamental differences in understanding and appreciating what is at stake (García 2012, Preciado Jerónimo 2012).

In general, many agree that existing organizational and institutional arrangements for governing water in Peru are poorly suited to tackle the governance challenges that arise in mining contexts.⁷ What is particularly problematic is that the main principle on which water governance in Peru is based is that of efficiency. Hence, the general rule is that water should be given under concession to those who most efficiently use it. This a priori dismisses other principles of governance, such as those of equity or sustainability (Boelens and Vos 2012), or those embedded in existing water management systems (Urteaga 2010, Varillas 2010, Hoogesteger et al. 2013). Mining companies can obtain water rights for industrial and domestic uses. These rights comprise permissions to extract groundwater; drain water; make alterations to water quality; and discharge treated water to the environment for agricultural uses; affecting communities and ecosystems.⁸ There are also many problems in monitoring and controlling the administration of mines' water uses and rights because of limitations

⁶ This is a task of the Mining Geological and Metallurgic Institute (INGEMMET)

⁷ For critical studies regarding Peru's water legal instruments see Del Castillo (2009), Morales (2009), Oré et al. (2009), (Urteaga 2010) and a report commissioned by the UNDP on water governance in Peru (Indij and Hantke Domas 2013).

⁸ For hydrologic studies of mining impacts see Cerdán (2015), Kuijk (2015), Vela-Almeida et al. (2016).

of water agencies and the powerful influence of companies (Preciado Jerónimo and Álvarez Gutierrez 2016).

It is because of the many socio-environmental problems that mining creates that it is very controversial, and the cause of a large number of conflicts. Peru's *Defensoría del Pueblo* (Ombudsman office) reports that, in 2016, most socio-environmental conflicts in Peru happened around extractive industries. The report counts more than 900 socio-environmental conflicts from 2004 to 2014 with a peak in 2009 during Alan García's second government.⁹ In terms of regional distribution, 19.85% of new mining investments happened in Apurímac, followed by Cajamarca (17.95%), Moquegua (13.11%), Ancash (6.14%) and Cusco (5.78%). These were also precisely the regions that featured most protests and conflicts in the last five years. According to Preciado Jerónimo and Álvarez Gutierrez (2016), during 2011 and 2014, about 153 cases of large socio-environmental conflicts involved water, most (67%) because of mining activities, followed by hydrocarbons (14%). The most frequent causes for conflict are pollution and competition for natural resources (access and use); non-consultation with affected communities and poor distribution of benefits, (Franks et al. 2014: 7577). Conflicts may take the form of strikes, road blocks, street protests, or damage to private property and regularly lead to fatal injuries (Panfichi and Coronel 2010, Franks et al. 2014).

The Peruvian government uses a combination of repression and dialogue to deal with these conflicts, and alleviate tension. (Melendez and León 2010). Violent repression and declarations of the state of emergency were the normal government response during García's and Humala's regimes. In recent decades, *mesas de diálogo* or negotiation and dialogue meetings have become more popular (Rees et al. 2012, Flohr 2014). One of the most prominent government offices intervening in socio-environmental conflicts is the *Defensoría del Pueblo*, which works at the national level but also operates *in situ* via its regional offices. It mostly assumes a mediating role and it is often considered by all parties involved in conflicts as a legitimate authority to provide advice. Other government bodies entering into conflict scenarios are the Prime

⁹ Government period 2006 – 2011. García's position on socio-environmental protests was repression and dismissal of communities' complaints, to 'have a firm hand' for conflicts (La República 2006).

Minister's Office (PCM), and representatives of different ministries.¹⁰ During the 1990s, the *Coordinadora Nacional de Comunidades Afectadas por la Minería* (CONACAMI National Coordinating Committee of Communities Affected by Mining) emerged as a prominent actor representing community interests and demanding vindication for communities' struggles (Palacín Quispe 2008). However, in the cases revisited for this thesis, this organization did not play an active role. Instead, at the communal level, affected communities and rural towns united their forces in so-called *frentes de defensa ambiental* or environmental defence fronts. These are mainly temporary civil associations with little capacity to create effective alliances with similar groups or demands (Melendez and León 2010).

1.4.2 Research sites and companies: Apurímac - Las Bambas and Cajamarca - Yanacocha

Apurímac and the Las Bambas copper mine

The Apurímac region is located in the southern Andes and comprises 7 provinces, 80 districts and 377 rural communities. Apurímac has a rugged topography categorized by Antonio Raimondi as crumpled paper ("*papel arrugado*"), combining high mountains with deep canyons. Mostly its population is rural and Quechua-speaking. Apurímac is one of the country's poorest regions: according to the 2012- 2016 Institutional Strategic Plan for Apurímac, the poorest provinces in the region are Cotabambas and Grau (Gobierno Regional de Apurímac 2012). These provinces are precisely the ones that host the Las Bambas mining company. Provincial government assessments report low agricultural productivity, and poorly developed roadway infrastructure, irrigation systems, and health-care services as compared to other areas in the region. Although reports also mention that the case study province of Cotabambas is rich in natural resources, such as water and land, growing problems of pollution and over-extraction have generated a wave of resource-related conflicts in the Province.

¹⁰ For example: mining and energy (MEM), agriculture (MINAG or MINAGRI), environment (MINAM), etc.

The region's main economic activities are livestock raising, particularly sheep and cattle, and subsistence agriculture. Practices such as barter (*'trueque'*) are widespread: the exchanging of products between communities from different ecological zones. Agricultural and livestock activities rely on seasonal water, taken by farmers from rivers and creeks. There have been few public investments in irrigation infrastructure and domestic public water networks. The study area's main water sources are the rivers of Challhuahuacho, Fuerabamba, Pumamarca and Pamputa and several small creeks. Land use here is organized either communally or individually. It is often based on groupings of smallholdings known as *laymes* –land access and usage rights– assigned to every family by communities. In legal terms, many communities are not being formally recognized as *comunidades campesinas* by the Public Register Office. This implies that community titles of ownership are not formally endorsed, but exist only in community inventories (IAG n.d.). Apurímac is one of the country's regions with most mining concessions, with about 65% of its territory concessioned for mining activities (see Figure 4). The field sites for this thesis are communities located in the district of Challhuahuacho¹¹ in the Cotabambas province, neighboring the Las Bambas mining company.

¹¹ See Appendix 2 for mining concessions in the district of Challhuahuacho.

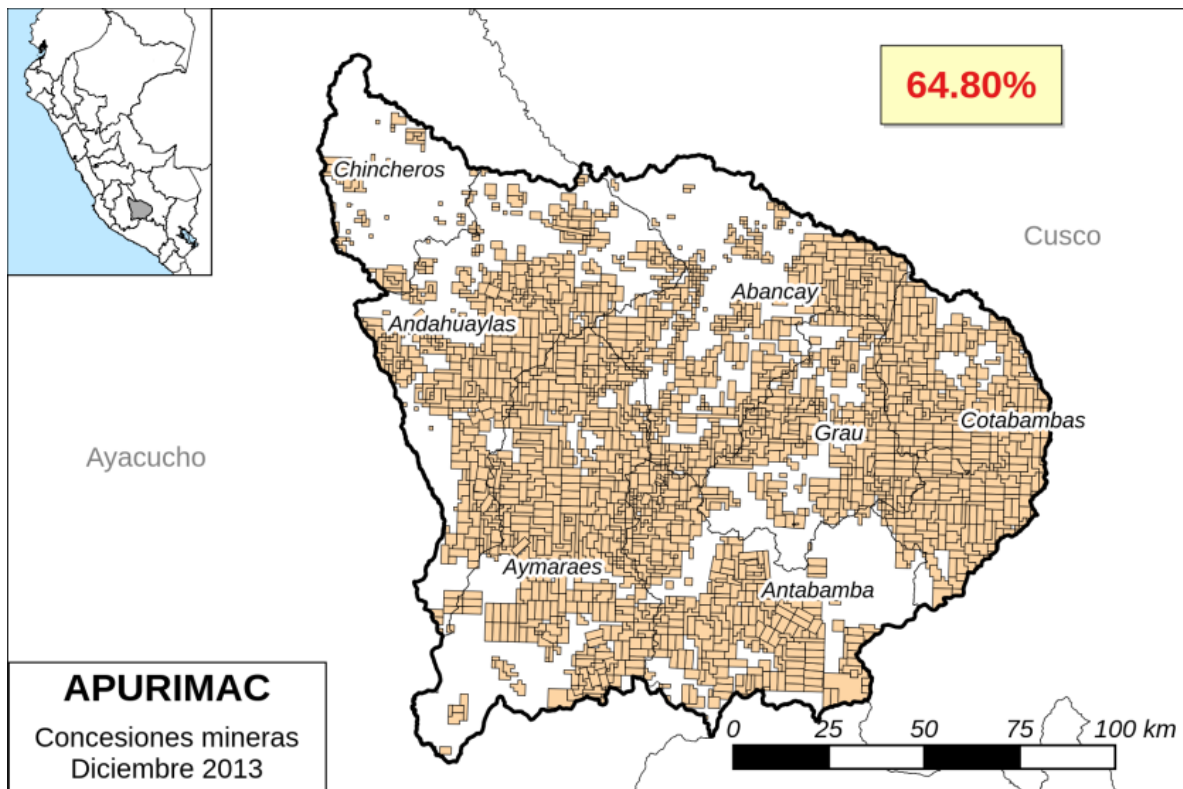


Figure 4. Mining concessions in Apurímac. Modified from (OCM 2013) by C. Cerdán and the author.

The opportunity to mine copper in the Las Bambas zone was discovered in 1911 by the Ferrobamba Limited Company, which nevertheless abandoned the site and concession after some years. In 2003, the state put the exploration of copper in the region out for tender. In 2004, the concession was awarded to the Xstrata Company, which later became Xstrata Copper, the world's fourth-largest copper producer. The Las Bambas concession's ore deposits are Chalcobamba, Ferrobamba, Sulfobamba and Charcas, located at 4000 meters above sea level -masl (ProInversión 2005). Xstrata began exploration in 2005, completing its pre-feasibility study in 2008 and the environmental impact assessment (EIA) in 2010 (IAG n.d.). In 2014 Las Bambas was acquired by the Chinese joint venture MMG Limited (62.5%), Guoxin International Investment (22.5) and CITIC Metal (15%) which finished the construction phase and started operations in 2016 (MMG 2014). Explorations are due to finish in 2034 (mining closure phase from 2034 to 2038) (CooperAccion 2015).

About 49 communities are located around the Las Bambas project. After modifications to the EIA in 2013, the direct-influence lease area involves territories of 18 communities

located downstream from mining. The mining operations also include the relocation of one community, Fuerabamba, because it was located on one of the deposits to be mined (SNC-Lavalin Perú 2014).

The concession area is about 35,000 hectares (ha), the mineral reserve contains an estimated 7.2 million tons (MT) of copper, the company invested more than US 5 billion dollars to develop the mine. The company estimated that it would be able to produce 2 MT of copper in the first five years of its operations. About 140,000 daily tons of mineral (or 51.1 MT per year) can be processed at the mine facilities (Las Bambas 2015). In its original plans, operations were also to include a 200km pipeline to connect the Las Bambas mineral production with mining processing plants and developments in the region of Cusco (de Echave 2014). After the EIA's modifications, the pipeline plan was dismissed, now production is done in situ affecting communities with huge traffic transporting the minerals to the coast for export.

Regarding water, the Las Bambas mine holds water use rights since 2004. The activities of the Las Bambas develop in the Challhuahuacho sub-watershed and compromise main rivers such as Fuerabamba, Ferrobamba, Pumamarca and Challhuahuacho, part of the Santo Tomás watershed in the Apurímac region. From the abovementioned water sources, the most compromised is the Fuerabamba river, formed by 15 small tributaries -820 L/s- and 120 seasonal and permanent springs -90L/s- that risk to be drained because overlapping with the open pit (CooperAccion n.d.). The company also enjoys permits to pump and store water in its reservoirs located upstream its processing plants to supply water for mining operations during drought periods in the area. Several communities in the vicinity of the water flows used by the mining company noticed a decline in water availability, which they felt was due to the company's exploration and operation work. However, due to high precipitation intensity in the region (average 1290 mm), the water authorities assume enough water availability for different users.

Cajamarca and the Yanacocha gold mine

The department of Cajamarca is located in the lowest area of the northern Andes. Cajamarca lies between two different eco-regions: the *sierra*, with its inter-Andean

valleys and mountains -up to 3590 masl- and the *selva*, or rainforest area -400 masl- (Gobierno Regional de Cajamarca 2011). Hydrologically, the rivers of the region belong to two main watersheds: the Marañón, -tributary of the Amazon River- and rivers that drain to the Pacific ocean (Kuijk 2015). Politically, it is divided into 13 provinces and 126 districts. Cajamarca is mainly a rural region (approximately 70%), with a prominent presence of smallholders practicing small-scale agriculture and livestock production (Alcántara Sánchez and Franco Muñoz 2010).¹² In terms of production, since the colonial period and particularly since 1940 with the *haciendas*,¹³ Cajamarca has been one of the country's most important regions producing and supplying milk and dairy products. Two main companies collect and process milk in the region, INCALAC-Nestle working since 1947 in the area and CARNILAC-Gloria, since 1998 (Ecurra 2001).

Currently Cajamarca is also one of the highest contributors to the country's revenues because of mining extraction activities in the region. In 2013, according to INGEMMET, the Cajamarca region had 2819 mining concessions (Chávez Ortiz 2014), covering about 41% of its entire territory (see Figure 5).¹⁴

¹²Agricultural units smaller than 10ha.

¹³ Hacienda system control production and labour in the region under the command of the landowner or *hacendado* (Deere 1990). The Agrarian reform in 1969 marks the end of the hacienda system.

¹⁴ Mining concessions concentrated in the provinces of San Pablo, Hualgayoc and Cajamarca, see Appendix N 3.

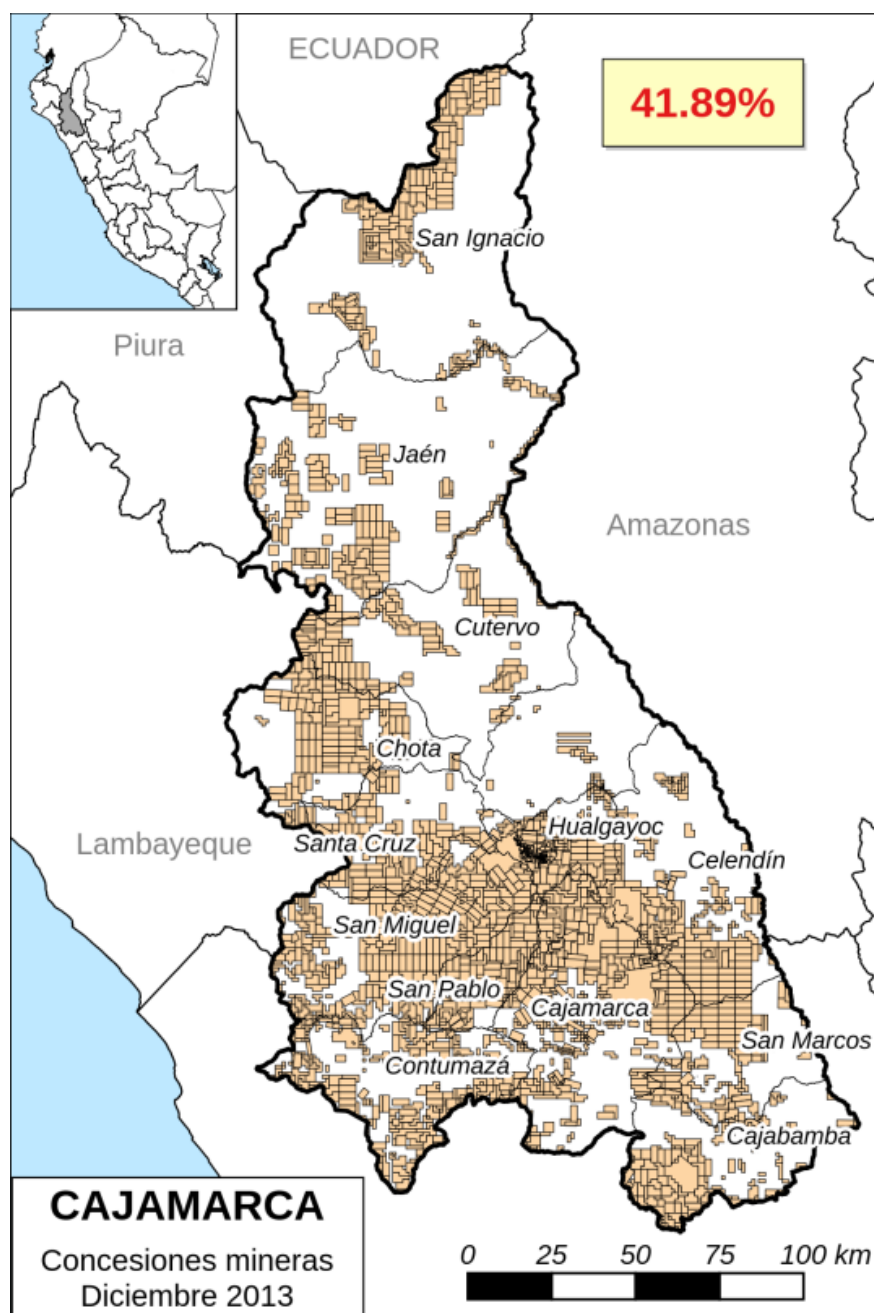


Figure 5. Mining concessions in Cajamarca. Modified from Chávez Ortiz (2014) by C. Cerdán and the author.

The city of Cajamarca is the department's capital, and is historically well-known because it was here that the Spanish conquerors captured the Incan Emperor, Atahualpa. This is a history that is already clearly linked to the availability of gold and silver in the area: according to the chronicles, the conquerors demanded one room full of gold and two of silver as a ransom to free Atahualpa. The conquerors "did not wait for the rooms to be filled and had the gold and silver melted down, obtaining about

4,510 kg of gold and 128,399 kg of silver” (Sarmiento Gutiérrez and Ravinez Sánchez 2009: 72). Rather than respecting the agreement, the conquerors killed the Emperor as soon as they had received their ransom. The memory of this brutal plunder is often revived by those in and around Cajamarca who are critical of mining operations; they draw parallels between the contemporary behaviour of mining companies and that of Spanish conquerors, seeing the region’s history one of continuous plunder (Elizalde et al. 2009). The field sites illustrated in this thesis are located in the surroundings of the city of Cajamarca, mainly in rural communities and the areas occupied by the Yanacocha gold mine.

Yanacocha gold mine is a complex of 5 open pits located 15km north of Cajamarca city, at the headwater areas of the region’s four main watersheds (Palacios-Berrios 2006, Yacoub 2013). The mine has been operational since 1992, producing its first gold bar in 1993. It is a joint venture of the American Newmont Mining Corporation (51.35%) – owners of the world’s first open-pit gold mine¹⁵- the Peruvian Buenaventura mining company (43.65%), and the World Bank financial sector (5%).

Yanacocha owns 267 mining concessions, making it the largest holder of mining concessions in the Cajamarca region, among 30 other holders (Bury 2007, Chávez Ortiz 2014). In a nutshell, mining operations began by extracting soil or material by using drilling and blasting. The extracted ore is transported to the heap leach platforms to be irrigated with a cyanide solution (50mg cyanide per litre of water) and extract the metals. The rest (waste) is deposited in backfills and tailing ponds. Rainfall that might affect the open-pit development is controlled by constructing drainage canal systems to convey water to the sedimentation or settling pond. The process also considers water treatment plants before water is released to the environment (Yanacocha 2007).¹⁶

Yanacocha as a site was given in concessions several times before the joint venture’s request. The concession was always returned to the state because no value was found during exploration work to pursue operations with the technology available at that

¹⁵ The first gold bar was poured by Newmont Mining Corporation at its Carlin Gold Mining subsidiary in Nevada on May 4, 1965 – 4000 tons of soil were needed for that first bar of gold (Morris 2010)

¹⁶ See the production of gold at the mine site in the Appendix N 4.

time – before the 1990s.¹⁷ Only the chemical technique applied by the Newmont corporation, mining by leaching, was suitable to mine this site.

“...The gold was invisible, even with a microscope... [t]he metal was so finely dispersed through the rock that it could be detected only by a fire or chemical assay... It took three tons of ore to produce just one ounce of gold... Finely ground ore was mixed with cyanide-laced water in an extraction process developed in Scotland in 1887... [the ‘rich’ solution] was filtered, mixed with zinc dust to precipitate the gold into a concentrate, and finally smelted into bars of gold bullion” (Morris 2010: xi).

Applying this technique made Yanacocha –compared with other productions sites– the Corporation’s most profitable enterprise. The final phases of the mining cycle entail closure and post-closure, needed to restore the areas to the way they were before mining disturbance.

Regarding water, large open pits such as in the Yanacocha complex rely on a constant supply of water. Yanacocha’s water managers portray the water use in the mining site to be a closed cycle, showing that any water input is controlled once it reaches the leaching platforms and ponds, treated in their acid water treatment plants –AWTP– facilities to then be released to the environment. The company argues that its water consumption is minimal (about 2 million cubic meters MCM per year), as compared to consumption by other water users such as farmers or the city of Cajamarca. Yet, and as commented on in Chapter 3, in addition to its need for continual, secure water supply for its operations, Yanacocha also extracts water during its work in the open pits. This process is called “dewatering”, and consists of draining groundwater –and surface water– into settlement ponds (ICMM 2012). This process lowers groundwater levels, alters water flows of rivers and creeks, and even makes entire springs disappear, impacting other water users downstream from the mining site (Younger et al. 2004). As Morris says about large open pits: “[t]he sheer size of operations creates inevitable tension wherever gold is mined” (Morris 2010: xiii). In terms of pollution, water quality studies carried out by Yacoub (2013) identified the type of pollutants

¹⁷ MEM officer, Personal communication Dec. 2012 – Lima

compromising the four watersheds where Yanacocha mining operations take place. The most dangerous, harmful heavy metals found in the Yanacocha mining site's surroundings are Cadmium, Arsenic, Lead, and Mercury. Implications of Yanacocha's operations for water quantities are described and discussed in Chapters 3 – 5 of this thesis.

In terms of interactions with local communities, Elizalde et al. (2009) observed that the lack of communication and compliance with local agreements at the earlier stages of Yanacocha's operations, marked consecutive tense community-company interactions. Adding to that, the arrogance and pejorative treatment from the mine's employees towards communities, plus the operations' environmental impacts, made the company very unpopular.¹⁸ The illegal surveillance campaign by the Yanacocha security company against environmental activists such as leader Marco Arana and the local NGO Grufides in Cajamarca (Boyd 2010), linked to the deaths of several environmental activists and farmer protesters, such as Isidro Llanos in Combayo – a case described in this thesis – further added to Yanacocha's bad reputation. Its overall negative image explains why Yanacocha is surrounded by conflicts and protests, the expansion projects at the Mount Quilish in 2004 and Conga in 2011, are famous examples.

1.5 Structure of the thesis

This thesis is organized into 6 chapters. With the exception of this introduction and the conclusions, all of the chapters of this thesis were published as independent, peer-reviewed papers. I only made some minimal modifications when making them part of this thesis. After this *introduction* in the first chapter, chapter 2 illustrates how the Las Bambas mine reconfigures local rural water arrangements in Apurímac, mainly through the formalization of water rights. Chapter 3 focuses on the politics of water grabbing, illustrating actions by the Yanacocha gold mine in Cajamarca to get access to and control over water resources that used to be controlled by rural communities. Chapter 4 critiques the effectiveness of planned conflict-resolution strategies in water

¹⁸ The mercury spill-over in 2000 from one of its contractor companies that affected the towns of Choropampa, San Juan and Magdalena, is one infamous example.

disputes between rural communities and mining companies, observing how the supposedly neutral instruments of law and science are invoked to reduce tensions. Chapter 5 explores the institutional regulation of water-resource sustainability in mining contexts, highlighting the importance of accountability and plurality. Chapter 6 presents the conclusions which include major findings, implications of the research for policies and methodologies, as well as for re-thinking water governance, and further ideas for research.

Chapter 2. The Influence of Large Mining: Restructuring Water Rights among Rural Communities in Apurímac, Peru



Challhuahuacho district, Apurímac. Photo: M. Sosa.

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2.1 Introduction

Since the 1990s, sizable foreign investment in the mining sector has transformed Peru's economy, with rising world-market ore prices turning large-scale mining into one of the country's main economic activities (Torres 2007, Hogenboom 2012). According to the Ministry of Energy and Mining (MEM), the portfolio of mining exploration and expansion counts forty-nine large projects, representing an investment of \$58.346 billion. The three regions that host the highest percentage of this investment are Apurímac (33%), Arequipa (16.4%), and Cajamarca (16.2%) (MEM 2016).

Even though mining is a main driver of the national economy, there are major controversies regarding this industry's social and environmental impacts (see also Bebbington and Williams 2008, Bebbington et al. 2010). The most tangible impacts that communities near mining operations experience relate to the degeneration and dispossession of water and land – the most crucial resources for community livelihoods (Perreault 2013, 2014a). Large-scale mining, because of the construction of open pits, requires the moving of huge amounts of soil, while also depending on permanent water flows for its operations (Budds 2010). Open-pit mining is typically located in watershed headwater areas (Bebbington and Williams 2008), which explains why mining interventions alter hydrological flows in terms of quantity and quality (Li 2016, Vela-Almeida et al. 2016). In addition to these profound material modifications of water sources and watercourses, large-scale mining operations also alter water control and governance arrangements, with mining companies often becoming the *de facto* water managers in Andean highland zones (Sosa and Zwarteveen 2012, Zwarteveen 2015). Changes in how water is governed are anchored in the formalization of water rights, a process that precedes or accompanies mining operations.

This chapter presents a contextualized analysis of the process and implications of formalizing water rights and uses¹⁹ in communities near the Las Bambas mining project and operations, in the Province of Cotabambas, Apurímac, Peru. It explains the

¹⁹ "Formalization of water rights" is considered as the act and process of legally recognizing customary ("vernacular" or "local," peasant and indigenous) water rights by the state water authority (Benda-Beckmann et al. 1998, Boelens and Seemann 2014, Roth et al. 2015, Seemann 2016).

reconfiguration of socio material arrangements to use and manage water provoked by mining developments. The chapter shows how earlier modes of sharing water are altered through new water management rationalities introduced with the entrance of mining operations. Resulting new institutional arrangements empower and privilege those communities and families who align themselves with the mining company, often at the expense of existing water governance and sharing arrangements. The chapter demonstrates the contradictions of such reconfigurations and illustrates how their net effect is a dangerous *de facto* concentration of water management powers in the hands of strong economic and political actors, like mining companies.

2.2 Methodology

The analysis is based on field work conducted in Apurímac during 2010 and 2011, with ongoing follow-up in subsequent years (2012-2016).²⁰ Communities were visited in the Las Bambas mining company's influence area (Fuerabamba, Pamputa, Huancuire, Choquecca, and Pumamarca) as well as in neighboring zones (Chila and Choaquere). In addition to reviewing literature; archives; and local, national, and international news, the fieldwork consisted of participatory observation, semi-structured and open interviews, participation in community assemblies, and regional forums. Fifty-two interviews were conducted: twenty-four with farmers and communities leaders; thirteen with government officials in Cusco and Apurímac (municipality and regional government, local water authority, and user boards); five with the mining company's representatives; and ten with researchers, advisors, and NGO representatives.²¹ The support of the Bartolomé de Las Casas Andean Studies Centre (CBC), a research partner working in the region for several years, was crucial for the research. Going to the field together with CBC's representatives helped us approach communities and start the research. Even so, conducting field research in the harsh, remote, and deeply marginalized highland region of Apurímac about the interventions of a multi-million dollar enterprise is inevitably influenced by the strong emotions and opinions that these interventions provoke. Particularly at the start of the research, communities'

²⁰ See Appendix 5 for a research guideline developed to approach water issues during fieldwork in Las Bambas.

²¹ The names of the interviewees have been omitted to protect their identities.

attitudes – while being mostly open, warm, and friendly – towards non-local researchers (even if Peruvian) could easily turn into distrust, for example, when a newly appointed community teacher stopped us from entering the school for a meeting that was planned with community leaders. Accusations of being anti-mine spies, or to the contrary of being secret mining agents, as well as questions about the funding sources of the investigation, influenced the atmosphere and contents of the research process. These suspicions and attitudes of distrust underscore the political sensitivity of the research topic. Water and livelihood questions lie at the heart of the strong polarization among and even within families over the rapid social, territorial, and livelihood transformations generated by one of the largest mining projects in the country, with experiences of loss and degradation mingling in complex ways with promises and high expectations of better futures (Tanaka et al. 2007). Conscious of the stressful ambience, informal meetings at, for example, the Sunday's market in Challhuahuacho were particularly important for approaching farmers and community leaders. Also, assisting the farmers when reading the formal documents given to them and collectively trying to understand environmental impact assessments (EIAs) and legalities concerning natural resource management and the mining operations of Las Bambas importantly helped to build confidence. My Andean background fostered an empathic link with the communities, while at the same time, her affiliation with a foreign university facilitated interactions with interviewees (farmers, state, and company's representatives); it triggered their curiosity about the research and made them eager to share their experiences.

In the next section, the chapter presents the conceptualization of water governance and water rights in smallholder farmer water management, highlighting the understanding of the legal dimensions of water governance processes in Peru. The fourth section presents some basic characteristics of the Apurímac region and the Las Bambas mining company. The fifth section documents the water sharing and management arrangements that existed before the arrival of the mining company; also discusses the process and impacts of formalization, including the tensions it generates. The chapter concludes that the recent formalization of water uses and rights in rural communities near mining operations imposes a new normative hierarchy that

privileges the rights of those aligned with the mining company over those opposing it. This provokes frictions and conflicts among and within communities while also irreversibly disrupting existing sharing and management arrangements. Water formalization policies interact with historically and politically grounded notions and practices of water use to produce impacts that are not always easy to predict. In the context of large social, economic, and political inequalities, there is nevertheless a clear risk that formalization will erode existing water logics and governance arrangements. In conclusion, we argue that understanding and considering the important role of local water arrangements can lead to more respectful policies towards rural communities and so may help to reduce tensions and conflicts among different water users in contexts of mineral extraction.

2.3 Examining water governance and the formalization of rights

2.3.1 Water governance and rights in contexts of local management

“Outside” interventions such as those provoked by mining operations entail re-allocations of water as well as reconfigurations of water sharing and management arrangements. Documented experiences of how this unfolds in the Andes of Peru show that making waters accessible to new outside actors often happens through the incorporation of these waters into state water governance institutions. This in general occurs with little regard for existing water management practices and arrangements (Trawick 2001, Lynch 2012), in spite of official policy discourses about the importance of recognizing communities’ rights. Indeed, the cultural diversity and epistemological complexity that characterizes existing water governance arrangements in the Andean highlands are inevitably eroded when inserted into one uniform, national framework explicitly aimed at the commensuration of different waters to make their comparison and exchange possible (Roth et al. 2005, Zwarteveen et al. 2005). In actual practice, “recognition” of existing *usos* (uses) and *costumbres* (customs) entails aligning these with national-level norms, rules, and laws based on distinct imaginaries of private property (Urteaga 2010). The cultural and political logic of existing arrangements and the history, culture, and sense of place of particular water actors and their multiple values are not considered by national laws (Ingram 2011); recognition happens in the

terms and logics of the recognizer, for example, the state (Gelles 2000, 2010, Guevara-Gil 2010, Guevara-Gil and Boelens 2010).

As we do not share the a priori belief in the desirability of the commensuration of water values and norms across places, our analysis of water governance and rights in the Peruvian Andes starts with the recognition that ways of dealing with, caring for, and sharing water are always an intimate part of history and territory. Our perspective is anchored in the realization that everyday water use, sharing, and management practices are always local: “Water is tied up with specific place-based ecologies involving community, culture, and identity and can be a symbol for security and self-determination” (Ingram 2011: 245). Instead of conceiving water rights as legally ordained state norms, we define them as living social, cultural, economic, and political normative arrangements that are embedded in wider histories and ways of living and being (Zwarteveen et al. 2005, Vos et al. 2006, Lynch 2012, Paerregaard 2013). It follows that we understand water rights as historically evolved logics of using, sharing, and caring for water that are embedded in more encompassing cultures of being and relating and part of wider social dynamics and power structures. This does not mean that we see “local” water rights arrangements as autonomous or isolated institutions: they dynamically interact with other normative and (state) legal frameworks to form plural and often hybrid rules, rights, and organizational forms (Boelens 2015).

Water uses, distributions, and the interpretation and implementation of rights inherently imply negotiations and sometimes contestations and conflicts, as different water user groups and sectors have divergent and sometimes opposing needs and interests. Negotiations and conflicts happen over the distribution of the resource but also over the values on which this distribution is or should be based (Ingram 2011, Zwarteveen 2015). The entrance of new claimants always entails a renegotiation of locally specific contents and definitions of “water rights,” or the existing mechanisms to access, distribute, and use water resources and decide about resource management (Guevara-Gil and Boelens 2010). This often results in redefining rules of access and inclusion (Schlager and Ostrom 1992, Roth et al. 2005, 2015). In contexts of large economic, social, and political inequalities, such changes will often benefit those actors

who are already better placed politically and economically. Existing imbalances among competing uses or perspectives may, as a result, worsen (Ingram 2011).

2.3.2 Water management and formalization of rights in Peru

In Peru, the Water Resources Law 29338 that was enacted in 2009 affirms that water is publicly owned and cannot be traded. Legal water access and use is regulated through permits, authorizations, and licenses. The National Water Authority (ANA) is in charge of managing the country's water resources. At the regional and local levels, Administrative Water Authorities (AAA) and Local Water Authorities (ALA) are the agencies responsible for granting and administering water rights in their respective jurisdictions.

In the case of the Las Bambas mining project, the Local Water Authority in Cusco, ALA Cusco, used to be the agency responsible for granting water and usage rights in the Province of Cotabambas, in the neighboring region of Apurímac. After 2011, this zone came under the jurisdiction of the Pampas Apurímac AAA, more particularly the ALA Medio Apurímac-Pachachaca. In addition to domestic and irrigation uses, this authority also grants permits for mining and industrial uses of water, among others. Permits, like other concessions, are specific for certain sources and uses. Before granting permits, the ALA/AAA is obliged to verify that sources are not in dispute and that granting rights will not deprive other users of water.

An important and noteworthy feature of the 23389 law is its explicit mention of respect for rural or indigenous communities' customary water management uses and rights. The law thus recognizes communities' rights to use water running through their land and water originating in the watersheds where their territories are located. This recognition happens through the formal incorporation of existing uses in national registers. The Water Resources Law establishes administrative obligations for formalizing these water uses, a process which starts with an application addressed to the Local Water Administrator. This application has to include land titles, cadastral and location maps, a register of the users, and a description of the villages where water is going to be used. In addition, the application needs to include a technical water study, which consists of a hydrological justification, planning and design, volumetric

flow measurements, water demand assessments, and project components (e.g., reservoirs, distribution network), as well as a budget for the costs of field inspections and administrative resolutions. The study has to be signed by a certified engineer, as rural communities are not considered sufficiently capable to carry it out by themselves.

The formalization of water rights, which is actively promoted through the National Program for Formalizing Water Use Rights (PROFODUA) (MINAG 2009), is part of a larger attempt to modernize the Peruvian water sector. The government received sizable funding from the Inter-American Development Bank and the World Bank (Lynch 2012) to support the process, with the objective of standardizing water rights and “promoting a modern water culture among the people.” Through PROFODUA, as Boelens and Seemann (2014) show, the Peruvian government and the banks adopted an approach to water rights following supposedly universal economic, legal, and scientific rules (MINAG 2009, World Bank 2012). The idea behind this is that the formalization of local communities’ water rights will increase water security. Beyond just protecting customary rights systems, formalization will theoretically also provide the poor with the means to become richer: by making exchange and transfer of waters and water rights possible, formalization allows the poor to capitalize on their water assets. The work of the United Nations Commission on the Legal Empowerment of the Poor (CLEP) was a major source of inspiration for this line of thinking.²² Established in 2005 as the “first global initiative to focus on the link between exclusion, poverty, and the Law,” it explicitly aimed for, as its working title expresses, “making the Law work for everyone” (UNDP 2008). In the Commission’s view, formalizing local and customary rights “transforms security and opportunity from the privilege of the few to the reality of all” (UNDP 2008: 22). In CLEP’s reasoning, formalizing tenure security is a prerequisite for the fight against poverty. In addition to increasing investments and the incentives to protect resources, formalizing property rights also provides clarity over intangible local, extralegal rights, which in turn will lead to a reduction in resource conflicts among farmers (de Soto 2000, 2002). “[F]ormal property is more than a system for titling, recording, and mapping assets – it is an instrument of thought,

²² The Commission, hosted by the UNDP, was co-chaired by Hernando De Soto, Peruvian economist and World Bank consultant.

representing assets in such a way that people's minds can work on them to generate surplus value. That is why formal property must be universally accessible: to bring everyone into one social contract where they can cooperate to raise society's productivity" (de Soto 2002: 355).

These ideas that inspired the Peruvian water policy reforms are rooted in liberal individualism (Roa-García 2014) and guided by notions of rational choice. They are anchored in the possibility and desirability of uniform rules and rights in the sovereign authority of the State (Roth et al. 2005, Achterhuis et al. 2010, Roth et al. 2015). Viewed through the lens of a liberal uniform rights' system, existing communal use and allocation practices, authorities, and management modes (Boelens and Seemann 2014, Seemann 2016) come to appear as remnants of a non-desirable, heterogeneous and backward past; a situation to be remedied.

2.4 The context: Las Bambas in Apurímac

2.4.1 The Apurímac region

The Apurímac region, which hosts the Las Bambas mining company, is located in Peru's southern Andes and comprises seven provinces, eighty districts, and 377 rural communities. Apurímac has a rugged topography, combining high mountains with deep canyons. Two-thirds of its population is rural and Quechua-speaking. Apurímac is one of the country's poorest regions: according to the 2012-2016 Institutional Strategic Plan for Apurímac, the poorest provinces in the region are Cotabambas and Grau – precisely where the mining company is located (Gobierno Regional de Apurímac 2012). For 2010, the per capita income in Challhuahuacho – the district hosting the company – was about US 62 dollars monthly, 30% of the national minimum monthly wage, estimated at US 203 dollars. According to Portilla (2005), Apurímac's structural poverty is due to its geographical isolation and lack of effective economic programs and public policies.

The main economic activities in the region are livestock, particularly sheep and cattle,²³ and small-scale subsistence agriculture. Practices such as *trueque* (barter) are

²³ Livestock activities in the region were also related to violent events of cattle rustling (Valderrama

widespread (Argumedo and Pimbert 2010), consisting of the exchange of products between communities from different ecological zones. Potatoes from high altitude are, for instance, exchanged for corn from medium altitudes. Agricultural and livestock activities rely on seasonal water taken by the farmers from rivers and creeks. There have been few public investments in irrigation infrastructure and domestic public water networks. The study area's main water sources are the rivers of Challhuahuacho, Fuerabamba, Pumamarca, and Pamputa. Rivers also partially filtrate and feed existing springs from where people take water as well.²⁴

In legal terms, many communities located in the region are not recognized as *comunidades campesinas* (communities). Some are in the process of being formally recognized by the Public Register Office. The implication is that community titles of ownership are not formally endorsed but only exist in community registers or inventories (IAG n.d.) Land use here can be either organized communally or individually. It is often based on groupings of smallholdings known as *laymes*,²⁵ with communities allocating land access and usage rights to families. After the land has been thus allocated, it may be inherited or rented out. Although not common, land sales do also happen but only if the full community assembly approves.

Provincial government assessments report low agricultural productivity and insufficient and deficient roadways, irrigation systems, and health-care services as compared to other areas of the region. While the province of Cotabambas is rich in natural resources such as water and land, growing problems of pollution and over-exploitation generate a wave of resource-related conflicts in the Province. In our case study area, in 2007, 31 percent (13600 km²) of the district of Challhuahuacho (43996 km²) was granted to mining concessions.²⁶ During 2015 and 2016, there were several socioenvironmental conflicts provoked by the presence and operations of the Las

Fernández and Escalante Gutiérrez 1992)

²⁴ The degree of infiltration varies depending on the characteristics of the aquifer in the area: limestone and permeable rock (SNC-Lavalin Perú 2014).

²⁵ Group of plots are assigned to every family for agriculture and livestock purposes (Xstrata Copper n.d.)

²⁶ About 72.6 percent of the territory of Apurímac has been granted to mining (Alegría Galarreta and Estrada Zúñiga 2010).

Bambas mining company; some farmers from different communities were even killed by the police during protests. In September 2015, as a way to suppress social mobilization and execute control by military forces, the central government declared a month-long state of emergency for the region (La República 2015).

2.4.2 The Las Bambas mining project

Copper in the Las Bambas zone was discovered in 1911 by the Ferrobamba Limited Company, which abandoned the site and concession after some years. Over the following sixty years, there were several other initiatives to explore the concession, on behalf of both the government and private companies (Montes 2008). In 2003, as part of the Peruvian Government's privatization policy, the Investment Promotion Agency (*Proinversión*) put the exploration of copper in the region out for tender. In 2004, the concession was awarded to the Swiss Xstrata Company, which later became Xstrata Copper, the world's fourth largest copper producer. In 2013, Xstrata Copper merged with the international Glencore Group (Xstrata Copper 2013), which sold Las Bambas to the Chinese MMG Limited in 2014. The ore deposits of the Las Bambas concession are Chalcobamba, Ferrobamba, Sulfobamba, and Charcas, located at 4,000 masl., in the provinces of Grau and Cotabambas (ProInversión 2005). Xstrata began its explorations in 2005, completing its pre-feasibility study in 2008 and the environmental impact assessment in 2010 (IAG n.d.). In 2015, the construction phase was finished, and operations started in 2016 (MMG 2014).

The concession area measures 35000 ha, with an investment of approximately US 5 million dollars (Xstrata n.d.) It is a mineral reserve that contains an estimated 7.2 million tons of copper and a total of 12.6 million tons of mineral resources. The company estimated that it would be able to produce 2 MT of copper in the first five years of operations (Las Bambas 2015). As a social contribution, US 45.5 million dollars of the US 121 million dollars of Xstrata's offer for the exploration concession was allocated to the Las Bambas Social Fund.

About forty-nine communities are located around the Las Bambas project, six of which sit directly in the perimeter of the mining concession: Fuerabamba, Huancuire, Pamputa, Chicñahui, Pumamarca, and Cconccacca (Gouley 2005). Because of its

location on one of the deposits to be mined (SNC-Lavalin Perú 2014), the community of Fuerabamba needed to be relocated. Fuerabamba consists of approximately 500 families and occupies an area of 8,660 ha in the district of Challhuahuacho. Xstrata negotiated with community members to establish the conditions for the resettlement and the other benefits that the community would receive in return for agreeing to make place for the mining company.²⁷ We focus our analysis on how these developments affected water in both the resettlement area, as well as in the communities of Choaquere and Chila which would host the relocated *Fuerabambinos*. We first briefly explain how the company obtained its water permits.

The mining project received permits to use water in 2006. These permits were granted by the ALA Cusco and approved by the Cusco Water Users Board (a federated organization that represents all water users). Permits were granted for (1) industrial uses, to control dust emissions and maintain access roads to the project zones, and (2) mining uses, to mix water with additive lubricants for drillings. Water sources to meet both uses were springs, creeks, and part of the Fuerabamba River. These sources are located in the communities of Pamputa, Huancuire, and Fuerabamba. For industrial uses, some 47.331 m³/year were granted, while 120.418 m³/year were allocated for mining use. The total water use permit for the company was 167.749 m³/year. In addition to these productive use permits, the company also obtained rights to use water for domestic purposes – approximately 21.800 m³/year – intended for its personnel during the exploration stage. These volumes granted by the ALA are different from those forecasted by the detailed EIA for Las Bambas, prepared by Golder Associates (2010). The numbers in the EIA seem to more accurately reflect actual requirements of the project: it assesses total water needed for drilling to be 3467.5 m³/year for each drilling rig, with a total of 166 drilling platforms, and estimates water needs for emission control to be 49.640 m³/ year (which is higher than the volume granted). For domestic uses, the EIA estimates that nearly 9.490 m³/year will be needed.

²⁷ For more information about the conditions of the agreement, see Sosa Landeo (2012).

According to the company's general manager, water would not become an issue during mining operations because the region is rich in water resources, and the company would only impact one of the region's six rivers, the Fuerabamba River. Contradicting this optimism are the company reports that indicate that in 2012 it used a water volume of 160.976 m³ from different rivers: Fuerabamba 113.395 m³, Challhuahuacho 14.994 m³, and Pumamarca 25.884 m³, as well as 2.204 m³ from the Patumayo creek (Xstrata Copper 2013). The farmers of Pamputa indeed noticed a decline in their water availability and also found that the color of the water changed. The water authority that granted the water permits to the company in 2009 shares the optimism of the general manager in its assessment that livestock production in the area will not be affected by the company's water use. They see no grounds for conflicts over water emerging between the company and local farmers. Yet, the same authority does admit that conflicts can arise when extraction activities begin.

To prepare the area and sources for operations, the company received additional permits²⁸ to use water and develop works along the Ferrobamba and Challhuahuacho rivers, as well as along some creeks located in nearby communities (Pamputa, Huancuire, Pumamarca, Choquecca-Antio, Quehuira, and Chila). In addition to these official water permits, the company also negotiated permission to pump water out of the Challhuahuacho River to be stored and used for its extractive operations during drought periods. The pumping zones are located in communities downstream from the project, in the district of Challhuahuacho. The negotiations involved purchasing some 30 ha of land from a community for US 2,200 dollars per hectare.

2.5 Water arrangements, formalization of rights and tensions within communities

2.5.1 Water and rural communities neighboring the Las Bambas project

In the area, water access and use have always been subject to negotiation and struggle. The history of the Choaquere *Puquio* [a spring], in the highlands of the community Choaquere, provides a telling example. In 1939, farmers from three communities –

²⁸ Among others are Res. N. 070, 080, 081-2012, and 0028, 0029-2013 ANA-ALA-Medio Apurímac.

Choaquere, Challhuahuacho, and Chila – fought for access to the water from this spring against farmers from the neighboring district of Haquira. After two days of clashes and strategic use of political networks, Choaquere and its allies succeeded in retaining their access to the spring. The *Haquireños* had to relinquish their aspirations to also access its waters (Alarcón n.d.). Years later in 1989, a new round of confrontations occurred in the zone around the springs. To strengthen their claims to the spring's water, the leaders from Choaquere and the other communities emphasized that the waters had belonged to them since the 17th century. The importance of safeguarding, protecting, and caring for the Choaquere Puquio and other springs are thus well ingrained in the culture and memory of the communities. Like other communities in the area, Choaquere allocates its various sources of water according to the specific uses and needs of its members. It also shares water flows with other neighboring communities, like Chila, and with the district of Challhuahuacho. For example, one of the springs located in the highlands of Choaquere – of about 11 L/s – is specifically designated for domestic purposes in Challhuahuacho, something that is recorded in an agreement signed between the municipality of the district and the community. Likewise, the Ccaccatuni Puquio was given by Choaquere to Chila, which is also shared voluntarily via a local agreement. In exchange, Choaquere farmers can take gravel from Chila for construction works in their community. Another spring was earmarked for sprinkler irrigation for Choaquere, Chila, and Minascucho, working together under a project developed by the municipality of Challhuahuacho. From the same source, the Choaquere community promised to divert water for a Domestic Sanitation Board (JASS) project to benefit about fifty-three families.

According to the project representatives, so far there is sufficient water in the territories of Choaquere. The problem is the infrastructure to access and convey it to lands and people. Some families, for instance, access their water from the Ramon Puquio source by using buckets. Others take water from a *acequia* (creek) that originates from the Illahuatana spring, for their consumption and for their animals. During the dry months of the year, even the permanent sources may run dry, forcing people to look for water beyond the communities' areas. Some take their horses and see where they can get

water, collecting it in buckets and transporting it to their homes (Alegría Galarreta and Estrada Zúñiga 2010). In these drier periods, they need to ration water and use it carefully for some days until another source is found. Via the water projects to be implemented in the area, farmers expect to bring water closer to their homes. Hence, the plan is for every family to have their own faucet with safe drinking water and for about 35 ha of pastures and vegetables to be irrigated.

Communities register their water sources, including small lagoons, in their community books; they know exactly how many sources are available and for what purposes. The *Choaquereños* thus know that most of their sources are already allocated to different purposes or shared with other users. Yet, and as we show in more detail below, the formal status of these records, plans, and sharing practices are disputed, while they are also poorly captured in the baseline inventories of water sources performed by the mining company. Community members are also less sure about the quality of their water sources, a problem that may become more urgent when water qualities are increasingly influenced by mining operations. “There were engineers doing some studies, but we did not receive that information on the spot... they know it, but didn’t tell us,” some farmers remarked, referring to the EIA a consultancy company was performing for the mining company. “Then, the engineers left books here, we don’t know if the information is there.... There is a lot of information, too much, but nothing that we can understand... we don’t know how to even start.”

2.5.2 Communities’ water rights and the formalization process

As noted, a community’s resources and sharing arrangements – including cropland, natural pastures, non-agricultural land, barren land, springs, creeks, and rivers – are often duly written down in community books (or statutes). Yet, it is only if they are also registered with the government office of public records in main cities such as Cusco or Abancay that a community’s rights to their resources are formally recognized or that the resources themselves formally exist. The importance of this becomes very clear when an outside claimant, like the mining company, wants access to these resources. The lack of formal registration, for instance, caused a mismatch between the mining company’s inventory of Pamputa community’s springs (it counted thirty) and

Pamputa's own records, which list many more: three lakes, forty-nine springs, creeks, and wetland zones.²⁹ Also, the lack of formal acknowledgment of Pamputa's existing uses and rights allowed the ALA to grant the mining company permits to use some of its water flows – for instance the 4 liters per second from the Huasijasa creek – without the community's knowledge or consent. In such cases, of which there are many, the sources the mine wants to use appear in formal records as unused sources, even when communities have been using them for a long time or when they are already committed to future uses.

According to the Water Resource Law, water sources *must be* registered with the Water Authority; it is not enough when waters are only registered with the community's books. In practice, until 2010, communities as well as local authorities deemed it sufficient to register their uses and sources of land and water with public registers. Formalizing rights was not common practice; "No one does it," explained the mayor of Challhuahuacho at that time. Even for drinking water projects, formalization only happened after projects began. This lack of formal registration was not a problem as long as water governance remained within locally recognized boundaries and as long as claims and rights were recognized and respected within these boundaries. It only became a problem when the mining company wanted a share of the waters and with the active promotion of the new water law. This is when representatives of the government started becoming more critical of customary water sharing practices and community registration. One water authority officer observed,

"Granting water rights is the exclusive task of the ALA; nobody can have property over sources because water belongs to the state...the water law only recognizes the communities' usos and costumbres, but that doesn't make them the owners of water...."

Communities are nevertheless hesitant to formalize their rights because it is both cumbersome as well as expensive. As some of the farmers explained, "Formalization is very costly, about US 4000 dollars, before it was even more expensive, around \$7000." When considering the high poverty rates in the region, it is clear that

²⁹ Community registers. 2010.

formalizing rights is something almost no community is able to afford on their own, without external sources of support. For example, as noted, the mining company proposed to pump water out of the Challhuahuacho River and store it for use in their operations during droughts. Pumping zones are located in communities downstream from the project and from the district of Challhuahuacho. The company held land negotiations with one community and agreed to have access to land and to the pumping zone. As a result, the community that engaged in negotiations has its water sources recognized and endorsed by the authorities, but those sources were shared with another community that was not aware of the negotiations or formalization process. The members of the second community did not even know whether they and their uses had been considered in the recognition process. What they found, as one farmer told us, is that the community with formalized rights “closes the pipe and keeps water from entering the canal.” Since there is no water anymore in the canal, they now have to look for other sources. The members of this community were not consulted about those negotiations and are now affected because they depended on those shared waters for their and their animals’ consumption.

The formal registration of rights also involves complicated procedures (described above). In addition, many communities did not see why they would need to formalize water rights: after all, they were managing their irrigation and domestic water resources on their own, and had been doing so for a long time, without ever receiving any state support. As water resources are located in their communal territories, communities considered them a part of their collective property. In this sense, Escalante (2010) is right in concluding that water never really became a public good in the Peruvian Andes: the “degree of control executed by the state was minimal or absent” (Escalante 2010: 251).

Early in 2011, however, this changed, and state-supported processes of formalization were started in communities neighboring Las Bambas: Choaquere, Chila, and a few others. They began registering their water uses and rights with the ALA Cusco and later with the ALA Apurímac. Community leader testimonies reveal that their agreement to this process was importantly prompted by their desire to protect their

water sources from the mining company, as two leaders from communities located within the area influenced by Las Bambas mining operations expressed: “Now with the mining company [in the area], we don’t know what might happen.” So, they felt it would be necessary “to get the springs recognized because over time, the mine may dry them up, or others may take the water if it is not recognized. When the mine comes, with this document, we will defend our water.”

Communities’ desire to more formally secure their future access to water sources was thus a response to a perceived (future) competition over their waters with Xstrata, which started mining operations in Las Bambas after the approval of their Environmental Impact Assessment. It is no coincidence that especially those communities which entered into direct negotiations with Xstrata engaged in the process of formalizing their rights. In part, these negotiations with the company earned them some income, which allowed them to pay for the costs of formalization. Hence, the communities of Chila and Choaquere obtained the money to start the formalization process through their land negotiations with Xstrata. Like other communities,³⁰ they felt the need to have some kind of legal protection to secure their current and future rights to water. The community of Choaquere took an active charge of the formalization process: “Now we are getting the ALA Cusco to register our water. This is under way. The engineers are collecting information on the sources and preparing blueprints, so water will be perfectly well recognized.”

Our conclusion is that the protection and respect of customary rights that the law promises is a rather empty one. In practice, the legal security is only for those who hold a difficult to obtain and expensive state water license or permit. When communities have not gone through the formalization process, their water resources are available to be given in concession to others (Alegría Galarreta and Estrada Zúñiga 2010).

³⁰ Communities from Cusco after getting the state water rights issued by the ALA, also registered them with the public registers “to be more powerful while facing interventions of third parties” or users (Escalante 2010:245).

2.5.3 Contestation and disempowerment of customary water rights arrangements

The resettlement process of Fuerabamba provides an interesting case to further shed light on the controversies and contradictions of water formalization rights. When we asked how the water was going to be distributed or shared with the new settlers, nobody in the area had precise information. The community of Fuerabamba fully relied on the mining company to get the water they needed in their new resettlement area. As some Fuerabambinos revealed, they were confident that if problems with water would arise, “the company will buy water for us.” The president of the community referred to their good relations with the mining company to justify this confidence. It was based on the several years of negotiations that Fuerabamba and Xstrata had already engaged in, negotiations about the resettlement process and the facilities that the company would provide to the community in the new area. In 2010, Fuerabamba signed the agreement to relocate Fuerabamba’s 500 families to the community territories of Chila and Choaquere. The mining company bought about 250 ha of land in total from these communities and would construct a new town: “Nueva Fuerabamba.” To arrange these purchases, Chila and Choaquere held a series of meetings with the company to clarify communal land borders, establish the exact area of the land, and agree on prices. Representatives of both communities reported that water was not discussed in those meetings: the question of how Fuerabamba would be provided with water was not part of the discussions. In contrast, the General Manager of the company, by referring to the new area for the resettled families as “a ‘New York’ in Challhuahuacho” suggested that the new plan included all facilities. He said that although not discussed in the meetings, they had taken care of water and would get it to Nueva Fuerabamba.³¹ In discussions with leaders of Choaquere, they pointed out that this water would have to be taken from elsewhere since their sources were already allocated.

The confidence of Fuerabamba in the company’s willingness and powers to look after them seemed justified when the process of getting water rights was set in motion. In December 2011, the president of Fuerabamba requested authorization to carry out

³¹ Personal communication 2011.

water studies in the area. This was the beginning of a process that would eventually result in Nueva Fuerabamba obtaining its water rights license for drinking purposes. The process was supported by the engineering and construction company GMI, part of the Graña and Montero Group, one of the biggest companies in the construction sector in Peru. This same company was responsible for the construction of the mining site of Las Bambas. Paid and commanded by the mining company, it was agreed that the engineering company would carry out the legally requested water and feasibility studies in support of Fuerabamba's water rights' application.³² After submitting the formal request, the law allows a period of seven months to finish all the studies needed to get the license. Yet, already one month after the application in January 2012, no doubt because of the engineering company's fast work, Fuerabamba delivered the water studies to the water authority and asked for its water rights to be approved. The process, however, did not go unchallenged.³³

As noted, many of the water sources are located in the territory of the community of Choaquere. Choaquere opposed the allocation of water rights to Fuerabamba. The farmers of Choaquere feared there would not be sufficient water for all and were reluctant to agree to interventions that would compromise their water sources without previous consultation. The respective water sources were already under pressure, as they were shared with two other communities and the district of Challhuahuacho,³⁴ with additional pressures arising from several future water projects that were already planned for irrigation, livestock, and domestic purposes. Choaquere argued that in not considering all present and future uses, the consultancy company's water studies overestimated availability. The community's doubts were backed up by the municipality of Challhuahuacho. The municipality suggested that Fuerabamba meet its water needs with water from sources different than the ones used by Choaquere.

Choaquere issued an official appeal against the studies and the proposed allocation of water rights to Nueva Fuerabamba, partly on account of the fact that it was not

³² RA 271-2012 and RA 0344-2013-ANA-ALA-Medio Apurímac- Pachachaca.

³³ For a summary of the conflict, see Defensoría del Pueblo (2012).

³⁴ Because of the Las Bambas mining developments in the district, the population grew with its commercial activities having new water demands from restaurants, hotels, and shops.

involved or consulted. They asked for the intervention of the ombudsman office to verify whether the process of establishing the study and the proposal was correct. Choaquere also questioned whether it was legally possible to grant water to a non-existing entity. Nueva Fuerabamba, after all, had not yet been allocated any legal status, neither as a community nor as a residence. The water authority transferred the issue to Fuerabamba for them to respond to these complaints. Backed up by the studies of the engineering company, Fuerabamba responded that there would be enough water for everybody to share. In the meantime, officials also started questioning the legal status of the disputed sources. Choaquere presented a request for getting state-endorsed water rights over its springs in 2011. However, this request was rejected by the authority because it did not include the respective “proper water studies.” The implication was that Choaquere did not hold any official water rights.

Because of the dispute and opposition to allocate water rights to Fuerabamba, the water authority organized a number of visits to Choaquere to inform them about the allocation and the full extent of the potential water rights for Fuerabamba. Meetings were also held between the mining company and the communities, including Choaquere, where, besides water issues, the company was reminded about the promises it had made to help developing projects in the area. The representatives of the company, although emphasizing that those communities were not part of the company’s impacted area and therefore were not entitled to compensation or projects, promised that they would consider the communities’ demands.

Choaquere continued its opposition against the allocation of rights to Fuerabamba, even intensifying it when it became clear that Fuerabamba not only wanted the water that was flowing from the springs but also claimed rights over the springs themselves. Farmers from Choaquere were considering protesting and blocking the road that connected Challhuahuacho and the mining operations with other regions like Cusco if these plans were to materialize.

The case illustrates how the promise of formal rights, together with the protection and support it received from the mining company, gave Fuerabamba a clear advantage over other users. As a local legal advisor commented, “In daily practice, the customary

rights of a community – Choaquere – cannot be paired with the water rights given by the state to a second community – Fuerabamba, particularly since the latter constitutes a strategic actor for the mining company. This actor will get all the attention, advice, and logistic support needed to materialize formal water rights, even if that means affecting other communities' rights." As noted, it is crucial for the company to deal with Fuerabamba's needs and the consequent resettlement process because the development of the mining site depends on this. The process of formalizing Nueva Fuerabamba's water rights lasted for more than a year, with several changes in the communities' board of representatives. There were several meetings between the water authority, the communities, and the company to discuss the water intake for Fuerabamba and development projects for the farmers. During these discussions, tensions were alleviated, and Choaquere agreed to share its water flows, which led the water authority to conclude that the "problems were solved." There were no further details given about any agreements regarding water sharing with Fuerabamba or others. The representatives of the mining company simply reported that there was "no more opposition in the area" and agreed to support several development projects in the communities, including Choaquere. At least for the moment, Choaquere was yet another community that seemed to be "convinced" by the economic support and development opportunities offered by the company – in any case, it did not have the force to continue its protests.

The water authority approved the water studies presented by Nueva Fuerabamba, certifying that 371 L/s would be available for diverse community purposes. This cleared the way for Nueva Fuerabamba to enter into the administrative process of getting its formal water rights.

2.6 Conclusions

This chapter presents a contextualized analysis of the influence of large-scale mining on the reconfiguration of water governance arrangements through the formalization of water rights. Focusing on the implementation of the mega mining project Las Bambas in the region of Apurímac, Peru, we illustrate the complexities, intricacies, and contradictions of the formalization of water rights in the communities neighboring

mining operations. While some communities and families strategically resort to formalization as a legal protection for their security of tenure against present and potential future demands of competing stakeholders, there are many who decide against it because it is a very costly and cumbersome process. Our examples in fact suggest that the mining company is often the source of the funding, and technical advice communities need to be able to actually start the formalization process. This is ironic, as the mining company itself has clear interests and stakes in the resulting re-definition and re-distribution of waters and lands, as it needs these resources for conducting its operations.

The arrival of the mining company, through the formalization of water rights, thus reconfigures existing water governance arrangements among communities and between communities and the state. Existing arrangements evolved over years: they are based on experiential assessments of availabilities and of needs and are anchored in wider relations of co-dependency and mutual help between and within communities, like the voluntary agreements for sharing water flows and springs. While not without their own problems and conflicts, these logics of sharing are now being superseded by new ones in which the ability to pay for technically determined assessments of quantities becomes the basis of rights to water. As noted, the water sources that the community of Choaquere had in their territories and used for different purposes were not respected because the community could not meet the technical requirements to officially formalize them.

Confronted with the combined legal, economic, and political force of the mining company and the state, communities have relatively few powers to protect and hold on to their own rights' systems. This becomes particularly evident when they are confronted with company-supported neighboring communities which claim their waters: communities with state-endorsed rights are in a much better position to defend their claims. The example of the Fuerabamba resettlement's incursion into the territories of Chila and Choaquere is a clear illustration of this. It shows how formalization may lead to the gradual decontextualization of water rights from histories, places, and cultural dynamics. Instead of protection, formalization erodes

the existing rights of rural communities if a competing claim enjoys the support of a mining company and the formal legal system. The formalization of one community's rights often entails the exclusion of other communities from previously shared territories and water sources (see also Boelens and Seemann 2014), with the simultaneous existence of different distributional logics increasingly leading to conflicts, both about who has or should have access to the resource and about the normative grounds on which access should be based.

We conclude that the recent formalization of water uses and rights in rural communities near mining operations imposes a new normative hierarchy that privileges the rights of those aligned with the mining company over those that oppose it. The formalization of customary water rights is a process full of contradictions, especially when triggered by the demands of an economically powerful extractive industry; formalization undeniably entails profound redistributions of water and land and reconfigurations of existing logics of sharing and managing water. It may imply the irreversible erasure not just of existing rights' systems and associated usos and costumbres but also of shared community histories and vernacular knowledges. The processes and impacts of water rights formalization need to be seen as part of ongoing and new dynamic interactions and struggles between communities, and between communities and mining companies, over access to and control over water and land. The state is never a neutral legislator in these interactions but actively favors some users and uses over others as part of an overall strategy of development and economic growth. Beyond the discourse of "customary rights protected by law," there is therefore a need to look at the actual results of formalization in terms of how it transforms or erodes existing customary rules, rights, and organizational arrangements. Which actors and interests are behind processes of the formalization of water rights, who benefits from such processes, who loses?

While in earlier days, communities established their own water governance principles, rights, and mutual responsibilities, now with the rearrangements in the area of Las Bambas, not just the rights but also the ontological and epistemological existence of communities' waters stem from and are articulated in the terms of state-endorsed and

technically-produced documents. How this matters is very much an empirical question. What is clear, however, is that with the loss of customary rights systems, also a wealth of knowledge about how to best care for water and equitably share risks disappearing. This is precisely the knowledge that may prove instrumental to countervail and resist the accumulation of water and its control in the hands of those who can pay for it or to develop and support more democratic and environmentally respectful ways of governing water.

This research stresses the need to understand and consider the already existing local water rights arrangements among rural communities, which determine the actual practices of water usage and governance at intra- and inter-communal levels. Mining and other extractive interventions usually take place in rural areas where formalized state rules and rights have low legitimacy, application, or even seem to be absent. It is fundamentally important that these interventions realize that they do not come to operate in “legally and institutionally empty spaces” but rather in contexts that are full of local arrangements, histories, institutions, and dynamics. Understanding and respecting the importance of these normative systems, recognizing the meaning and values of water beyond its material quantity and quality conditions, and avoiding the decontextualized imposition of state formalization processes can contribute to reducing tensions and conflicts among different water users.

Chapter 3. Exploring the politics of water grabbing: the case of large mining operations in the Peruvian Andes



Children and an irrigation canal, Cajamarca. Photo: M. Sosa.

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3.1 Introduction

"*El Perú es un país minero*" (Peru is a mining country). With this statement, pronounced during the opening ceremony of a water reservoir constructed by the large gold mine Yanacocha in Cajamarca in 2008, the then president of Peru Alan García underscored the government's fondness of the mining industry. From the 1990s onwards, the different Peruvian governments have actively promoted mining as one of the cornerstones of the country's development through state measures to attract and secure private and often foreign investments in mining (de Echave et al. 2009a). Helped by the worldwide increase of mineral prices, these measures resulted in a mining boom that was particularly remarkable from 1999 to 2009 (IPE 2011). According to (2007) from 1990 to 2005, the sector sparked the development of the national economy, with global GDP rising only by 80% as compared to that of mining increasing rising by 221%.

Yanacocha, in the northern Peruvian Andes, was the first large mining investment that benefited from the new favourable legal and policy climate. Since its establishment, Yanacocha's production has significantly contributed to making Peru one of the most important mineral producing countries in Latin America and worldwide (Torres 2007). Although undeniably positive for the national trade balance, there is much controversy and debate about the impacts of large mining industries on the areas where they operate, as they provoke significant social, economic and environmental changes (Bury 2004, 2005, Bebbington 2007, Bebbington et al. 2008) which are not necessarily positive. This is why Bebbington et al. (2008) characterize the relationship between large mining and development as "contentious and ambiguous", as "mining has often delivered adverse social, environmental and economic effects for the many, but significant gains only for the few" and "because of the abiding sense, among local populations as much as development professionals, that *just maybe* mining could contribute much more" (Bebbington et al. 2008: 887). Analysing mining as a form of capitalist expansion that deeply transforms the development of those rural territories where it operates, Bebbington (2007) argues that a development model based on (foreign) mining companies has its price. "It transforms livelihoods strategies, social relations of production and forms of environmental governance in those territories"

(Bebbington 2007: 35). These changes and transformations do not go uncontested, but provoke sometimes violent resistance and reactions from civil society groups at different scales (local, national, international).

The best documented impacts of mining operations on local communities are about how mines appropriate resources (in particular land and water) compromising livelihoods and environments. The focus of this chapter is on water, a resource that is of crucial importance for mining operations. Gold mines, for instance, require a large amount of water to 'wash' the soil containing gold minerals (Budds 2011). In addition, mining sites are often located in the catchment areas of water sources and rivers (Bebbington and Williams 2008), which means that mining operations affect, and often alter, hydrological regimes and the quantity and quality of downstream water flows. Mines also contaminate water through leaching (infiltration of acids and heavy metals used for ore separation) and dumping of tailings (finely ground rock from which ore had been extracted). Mining operations, in sum, entail profound material modifications in water flows.

The chapter uses the case of the Yanacocha mine to show that alongside producing such material effects, large mining operations in rural areas are also accompanied with profound and often irreversible changes in how water is controlled and managed. It argues that these reconfigurations of waterscapes provoked by mining operations can be understood as a form of water grabbing. This argument is made on the basis of a detailed description of what we call the politics of water grabbing, presenting two cases that show the mining company's strategies to acquire control over water. It shows how the appropriation of water by the mining company happens through long-winding and often somewhat shady processes of negotiation and struggle between the company, the surrounding communities and different government agencies. The descriptions illustrate that both the mining company and the communities a) skilfully make use of the institutional and legal fuzziness and plurality that characterize water tenure relations in the Peruvian Andes, especially after the new water framework took effect in 2009 (Del Castillo 2009, Budds and Hinojosa 2012) and b) also, often, resort to extrajudicial means for defending their claims.

These negotiations and struggles occur in one of the poorest regions of Peru. In 2011, the Ministry of Finances and Economy (MEF 2012) reported that Cajamarca presented the highest number of poor districts in Peru. It is a region consisting largely of rural areas and inhabited by small livestock farming communities. As we show, the political agency of the people in these communities is remarkable and many also display a deep awareness and pride of their territory and natural environment. Yet, and even though they are assisted by environmental NGOs, their bargaining power is very limited as they hardly have any fall-back position, making it difficult for them to say no to the financial compensations and favours that the mining company offers them in return for water. In terms of money, these compensations are enormous as compared to their normal earnings.

The empirical material for the chapter comes from 18 months of research in the region conducted between 2009 and 2011. Semi-structured interviews were conducted with key informants from rural communities, the Yanacocha Company, local NGOs, water authorities at the local and national level, and local government offices (we anonymised their names).

In what follows, we first briefly explain our theoretical points of departure. Before moving on to the description of the two cases (La Ramada canal and the San José reservoir), we provide a background of Yanacocha mine and water use in Cajamarca. In the last section, we draw three major conclusions about how mines alter waterscapes. Our cases illustrate that mining operations not only change how and who uses water but also reconfigure water governance, with the mining company obtaining control over water and assuming major responsibilities for water allocation. The longer-term impacts of these changes on livelihoods and environments remain poorly understood, although it is clear that the 'de-territorialisation' of water management that it entails is irreversible.

3.2 Water grabbing and mines: Some theoretical points of departure

In analogy with the definition proposed by Borras Jr and Franco (2012) for land grabbing, we define 'water grabbing' as involving both changes in water use, and (perhaps more importantly) also involving (irreversible) changes in water tenure relations. As with land grabbing, this process involves the enclosure of commons by multinational companies and government agencies, dispossessing peasants and indigenous people and altering the environment. Our understanding of water grabbing rests on the concept of waterscapes. The term allows recognising how the natural and the social environments always co-constitute each other, and is therefore useful "to explore the ways in which flows of water, power and capital converge to produce uneven socio-ecological arrangements over space and time" (Budds and Hinojosa 2012: 124).

We associate changing waterscapes through water grabbing with the so-called 'neo-liberal turn' and the neo-liberalisation of environmental arenas of governance, as well as with the privatisation and commoditisation of nature (Bakker 2002, Fairhead et al. 2012), a stream of theoretical literature which focuses on the inevitable environmental dimensions of neo-liberalism, trying to understand how capitalism emerges through a restructuring of nature-society relationships. In particular, we use these insights for conceptualising water governance as a form of state re-regulation to secure capital accumulation, through both material and discursive means, which produce particular forms of authority and social order (Budds and Hinojosa 2012). These ideas are inspired by discussions on water becoming a commodity (Prudham 2009), and a necessary lubricant for capital accumulation (Budds 2011). Our analysis thus suggests that the entrance of mines in waterscapes entails the introduction of market dynamics or market-oriented processes in water management, allocation and supply, leading to the commercialisation or privatisation of water management (Bakker 2002).

3.3 Cajamarca, water and Yanacocha

Cajamarca is located in the northern Peruvian Andes, and therefore is a region characterized by mountains, high grassy plains and valleys. The capital of the department is the city of Cajamarca, located at 2700 masl., in an inter-Andean valley

and surrounded by mountains of about 4000 masl. Since hacienda times, Cajamarca has been one of the most important regions for livestock and dairy production in Peru (Armijos 2005). The livelihood activities of rural households consist of grazing cattle, milking schedules, milk delivery and milk-related production. Small-scale agriculture is also part of the activities of the region, which depends on irrigation. Irrigation is mainly done with water from streams and sources located in the high mountains which are channelled to the agricultural fields through a network of rudimentary canals. To manage these irrigation canals – e.g. distributing the available water supply, establishing the delivery turns and organising maintenance work – the farmers organise themselves in water user associations. These associations take decisions collectively or in consultation with the community general assembly. They are also responsible for formally registering their association's members and the water sources that they use. Rights to water – *permits, licences or authorisations* – are registered in the names of these associations, and it is also the responsibility of the associations to renew such water rights. When water is also used for other purposes next to irrigation, the rights specify this. Not all associations have their records, rights and registrations in order.

In the mid-1990s Cajamarca gained importance as a significant contributor to the national economy, due to the operation of a large gold mine, Yanacocha (established in 1993). According to the Ministry of Energy and Mining, Cajamarca is the second most important region – of the 12 Peruvian Andean regions – in terms of mining concessions, particularly for gold, silver and copper production. In 2008, about 40.88% of Cajamarca's territory was given out for mining concessions (Grufides n.d.). For the last 10 years, in the Cajamarca region, at least 10 transnational mining projects have been implemented and developed by transnational and national investors. Yanacocha is very prominent among these. It is the largest gold producer in Latin America and one of the most profitable mining enterprises in the world (Bury 2005). The operations are established from 3500 to 4100 masl.; 48 km north of the city of Cajamarca and 800 km north of the capital city (Golder Associates 2008). It is a surface or open pit mine consisting of four heap leaching platforms and three gold recovering plants (Elizalde et al. 2009). The company is a joint venture owned by Newmont Mining Corporation

(USA), the Buenaventura mining company (Peru), and the financial sector of the World Bank (Kuramoto 1999, Bury 2005, de Echave et al. 2009a). Since its establishment, the production of Yanacocha has exceeded 26 million ounces (Newmont 2008). In 2008 and 2009, Yanacocha produced 1,8 and 2,0 million ounces, respectively, making profits of about US 1.6 billion dollars and 2.1 billion dollars, respectively (Yanacocha 2010). The mine constitutes the first large-scale heap leaching mine in Peru and is "the largest heap-leaching operation in the world" (Newmont 2002 in Bury 2005: 10).

As Yanacocha itself states: "[t]he development of our activities requires water. [We] accumulate water from rainfall, surface and groundwater [extraction] and drainage, to use them in our operations" (Yanacocha 2009: 23). The process of obtaining gold consists of the removal of large amounts of soil deposited in the pads or platforms. This soil is then constantly irrigated by a cyanide solution (50 mg per litre of water) which dissolves the gold, and through pipe systems this gold-containing liquid is pumped to the processing plants where the gold is recovered. Hence, for producing gold, Yanacocha requires a permanent supply of water (Yanacocha 2009). According to its annual report of 2009, the total amount that entered into its productive process in that year was about 33 MCM, most of which reportedly came from groundwater sources (Yanacocha 2010). All the water used by Yanacocha's operations is (in principle) stored in a reservoir constructed for this purpose, where the water is treated before it is released to the surrounding communities.

The mine, however, does not just require water for its operations but also alters water flows because its site is located in the headwaters of five of the main rivers of the Cajamarca region (Yanacocha 2008), hence also at the place where many sources and streams feeding irrigation channels are located. According to the reports of the mining company, there are about 9,330 farmers' families living in the area influenced by the mining company (Yanacocha 2007a). During the operations on the open pits, groundwater sources are removed in a process called 'dewatering'. According to one of the mine's managers, this water is not necessary or useful, *it is a burden*³⁵ and hampers operations, which is why it needs to be pumped or removed. This dewatering

³⁵ "El agua ahí es mas un estorbo". Personal communication, Mining manager 1, 2010.

process has enormous implications for the downstream waterscape: lowering groundwater levels, altering the flows of rivers and creeks and even making entire upstream lakes disappear. There are also repercussions for the operation of existing downstream hydraulic networks, for instance, irrigation systems (Younger et al. 2004).

Besides dewatering, the extraction of water is accompanied by capturing and draining of surface water, from small lakes and water springs. This is done to secure operations on the pit and to prevent acid mine drainage. This is the result of a chemical reaction that can occur when removed metal sulphides exposed during the soil removal enter into contact with surface water (e.g. from rainfall of surface sources) and air (oxygen).

According to Yanacocha, most of the water that it uses is treated and recycled. In one of its sustainability reports, the mine states that its water use for 2009 amounted to 125,100 MCM. The report claims that 98% of this amount was reused and recycled, and that therefore only 2% was actually consumed in mining operations. According to the mine, therefore, its actual consumption of water: 2 MCM is negligible compared to the amount used by agriculture – in the 5 catchment areas – which is estimated to be about 68 MCM (Yanacocha 2009).

Indeed, Yanacocha uses such figures to boast of its environmental awareness. Yanacocha's focus on net consumption, however, is misleading as it obscures the impacts of Yanacocha's operations on the quality and quantity of downstream water flows. In an attempt to arrive at more accurate figures that do take these impacts into account, Preciado Jerónimo (2011) analysed Yanacocha's water use in the framework of a river basin. The author arrived at an estimate of Yanacocha's yearly use of around 34 MCM instead of only 2 MCM, this quantity was calculated considering the water consumed by mining operations (2 MCM) and the extracted groundwater (32 MCM). In her analysis, Preciado Jerónimo (2011) highlights that there are extra amounts of water that are involved in the mining operations, but they are not quantified such as drainage water from surface water sources and the amounts of water that, in the long term, are taken from the watershed because of mining operations in the area.

Yanacocha covers an area of about 10,000 ha in three main districts of Cajamarca: La Encañada, Baños del Inca and Cajamarca. This large mining site is adjacent to around 100 rural communities. The national land titling and registration programme (PETT³⁶) initiated in 1992 by the Peruvian government, largely in line with the ideas of de Soto (2000), greatly facilitated Yanacocha's acquisition of land; once land titles were registered through the PETT process, they could also be transferred and sold (to the mining company). Evidencing its interests in the matter, Yanacocha even actively supported parts of the PETT process, by helping the clarification of the land status and legal ownership through rapid land-titling initiatives in communities (Bury 2005).

Yanacocha acquired most of its land by direct purchase, and some through negotiations. The direct purchases or plot negotiations were done between Yanacocha representatives and the landowners. With hindsight, many involved feel that Yanacocha obtained land at very low prices (for example US 25 dollars/ha) (Deza 2008). Land transactions were the cause of several socio-environmental conflicts between Yanacocha and the inhabitants of neighboring communities. In case a landowner refused to sell or did not want to negotiate, the mine would take actions to have the plot expropriated by force and registered as property acquired under resistance (SCG 2004).

Through its acquisition of large portions of land, Yanacocha de facto appropriated the means of subsistence and production of many people in the area. According to many of them, this comes with responsibilities: they feel that Yanacocha should be creating employment and provide assistance to those deprived of their land. The families' perception was that the work replaces the land. Thus for them it was not a gift, but their right, so it must be considered as permanent and inherited (SCG 2004).

In what follows, we provide detailed descriptions of two specific sets of encounters between the mining company and the surrounding communities about water.

³⁶ Programa Especial de Titulación de Tierras (PETT), which was created and implemented to promote the formalisation of property rights in rural areas. This is to provide land titles to farmers and in that way to support their private landownership.

3.3.1 Case 1: La Ramada Canal

In this first case, we illustrate the strategies of the mine to gain access to, and control of, water from a particular set of sources (in the Cerro Negro mountain) which used to feed the La Ramada canal, a canal used by farmers to irrigate their fields, about 247 ha of agricultural crops like potatoes, barley, wheat, among others. The beneficiaries of this canal were two communities from the rural town La Ramada: La Ramada and Manzanas, located in the sub-catchment area from the Porcón and Maschón rivers.

The canal La Ramada was constructed in the 1980s, under the enthusiastic leadership of Don Eusebio. He organised the farmers to collectively work on its construction, a tremendous effort which took a long time, from 1982 to 1986. It was a tiresome and difficult process, because of the roughness of the terrain and the remoteness of the water sources. Many *comuneros* still vividly recall the hardships they faced when building their canal: "[w]e walked for hours very early in the morning to reach the sources and worked the entire day".³⁷ Once the canal was built, Don Eusebio also took the lead in officially registering it, so as to formally establish the water rights of the involved *comuneros*. In 1989, the *Cerro Negro – La Ramada* canal of 17 km of length was officially registered and got state water rights licences. These were issued by the General Water Directory of the Ministry of Agriculture to the water users of the La Ramada and Manzanas communities.³⁸ These water rights authorised the members of these communities to use the water from a group of natural springs located in the Cerro Negro area.³⁹ Some of these springs are located in the Cajamarca watersheds, while others are in the Jequetepeque watersheds. The water flows given were about 13 L/s to irrigate 247 ha of agricultural land. Logically, Don Eusebio also became the first president of the water user association of the La Ramada canal.

These Cerro Negro water sources which feed the canal are located on the land that was later purchased by Yanacocha, soon after it started its operations in the area in 1993.

³⁷ Farmer 1. Personal communication. 9 April 2009.

³⁸ Resolución. N. 065-89-AG-DGA. Ministerio de Agricultura. 1989. (Res. stands for 'Resolución' in the remainder of the chapter).

³⁹ The water sources and the respective flows were: Rumi Rumi (or Rume Rume) 3L/s, Cuyoc 3L/s, both sources located at the Jequetepeque river basin and Perga Perga 7L/s located at the Cajamarca river basin.

Yanacocha bought this land from the *Granja Porcón*, which is an evangelical farming cooperative that was established (and had received its land) as a result of the Land Reform of 1969 (Granja Porcón n.d.). This cooperative owns about 11,000 ha in Cajamarca and its relationship with Yanacocha is one of friendly comradeship. Yanacocha also wanted to be able to use the riparian (adjacent) waters, including those from Cerro Negro, as a source of drinking water for one of its mining camp sites, La Pajuela. In 2003, Yanacocha applied and got the official water rights⁴⁰ to use 8.5 L/s from the Cerro Negro water sources. These rights were issued by the water authority of Jequetepeque -*Administración técnica del distrito de riego del Jequetepeque* ATDRJ. As part of the requirement to apply for water rights and to reinforce its application, Yanacocha presented its land titles to prove that the water sources were located within its private property.

The members of the Canal Ramada water user association were not aware of the fact that their rights to water had been transferred. In 2002, a group of some ten *comuneros* got together and travelled to the catchment area to clean parts of the canal. To do this, they had to enter the area that now belonged to the mine. Yanacocha discovered this, and accused the farmers of trespassing and denounced them to the Crime prevention office of the Cajamarca court.⁴¹ To the farmers' surprise, Yanacocha also stated that the farmers' use of the Cerro Negro water sources and the canal was illegal, since (according to the mine) their rights to these waters had been officially revoked. The court decided not to take any actions against the farmers, because there had not been any violence, nor had any private property been damaged.

It was through this incident that the farmers found out that there was something wrong, and they started inquiring about the status of their water rights and their canal. They soon found out that Don Eusebio, their charismatic leader, had arranged for the cancellation of their rights. In 2001, he had (together with another leader of la Ramada) presented a petition to the water authority of Cajamarca -*Administración Técnica del*

⁴⁰ The given water flows were: Rumi Rumi 1: 1 L/s, Rumi Rumi 2: 0.20 L/s, Rumi Rumi 3: 2 L/s, Cuyoc 1: 1 L/s, Cuyoc 2: 1.50 L/s, Cuyoc 3: 1 L/s, Quebrada Cuyoc: 2 L/s, Pampa Cuyoc 1: 0.15 L/s and Pampa Cuyoc 2: 3 L/s. Res. N. 036-2003MA-ATDRJ.

⁴¹ Distrito Judicial Cajamarca Res. N. 005-2002-MP-FDS-DJ-Cajamarca.

Distrito de Riego de Cajamarca ATDRC- to cancel the communities' water rights. The reasons he gave for this request were that the water flows and the canal were no longer in use, and that the canal was damaged because of leakages. In addition, he mentioned the fact that in La Ramada, Yanacocha is already executing programs of provision and improvement of drinking water systems, supposedly indicating that the Ramada and Manzanas communities would, in the future, access water through these systems. Don Eusebio had undertaken this action entirely on his own account, and without informing the other members of the La Ramada water user association. In response to Don Eusebio's request, the ATDRC – based on the water law⁴² 17752– revoked the water rights for irrigation given to the La Ramada and Manzanas water users. Their main arguments to do this were: the lack of maintenance and cleaning of the canal for about 4 years; the fact that the users' register was not updated; and the failure of the users to pay water fees.⁴³

Why had Don Eusebio initiated this process? His relatives –and in particular his grandsons– speculate that he was approached by Yanacocha. They think the mine may have offered him money to help pay for his medicines, in return for which he had to make sure the canal was abandoned to allow for the rights attached to it to be cancelled. Another water user likewise thinks that "the mine paid him little by little to stop organising users for the canal maintenance work".⁴⁴ The water users all state that Don Eusebio had been acting entirely on his own account, and not as the president of the canal. They emphasised that they had not been aware of the cancellation. Of course, the official cancellation of the rights of the La Ramada and Manzanas users was indeed convenient to the mine, as it allowed the company to formally acquire these rights, which happened in 2003.

Although there are no precise measurements, it is clear that the loss of the La Ramada canal did significantly reduce farmers' access to water. People interviewed agreed that there was less water, and that this was becoming an ever more serious problem with

⁴² Article 116, section about cancellation of water rights (República del Perú 1969)

⁴³ Res. N. 118-2001-CTAR-CAJ/DRA-ATDRC.

⁴⁴ Farmer 2, personal communication May 2009.

the population of the communities increasing.⁴⁵ As one farmer observed: "before we could irrigate for about 12 hours every 45 days but, after the water decreased, we irrigate less than 3 hours and using only water from [surrounding] canals".⁴⁶ Some users indicated that they had changed their cropping pattern because of the reduced availability of water, and were now only irrigating pastures to at least be able keep their livestock production.

The story, however, does not end with Don Eusebio's action. Some of the affected farmers got together and (in 2004) filed an official complaint with the Regional Agrarian Office from the Ministry of Agriculture. Their story was treated seriously, and the Office enacted a resolution in support of the farmers' claims. The resolution recognised the existence and legitimacy of the La Ramada canal and the assigned water rights given to the farmers in 1989. Before arriving at this conclusion, the Office had carefully analysed how the cancelation of the water rights could have happened. Their conclusion was that the process of cancellation was not legally valid, because the canal leader had not acted on behalf of the water users, and had not properly notified or informed them.

Yanacocha's reaction to the resolution was clear: they dismissed it by questioning the authority of the Regional Agrarian Office to deal with water rights. According to the mine, water should be dealt with by water authorities, the ATDRs. The mine's view of the matter was that the canal and its water rights were cancelled because they had not been used since 1997. To further lend support to its own position, Yanacocha did everything it could to question the very existence of the canal La Ramada. The mining company for instance produced maps which showed that the canal was seriously damaged and interrupted at several places, and therefore could not have conducted water (see Figure 6). In the words of one of the mine's managers "the canal was no more than a large hole".⁴⁷ Also, to disqualify the canal and its users, in its documents the mine referred to the "auto-nominated users of the supposed canal La Ramada".⁴⁸

⁴⁵ There is water only in the mornings from 8 to 11.

⁴⁶ Farmer 2, personal communication May 2009.

⁴⁷ "El canal no es más que un hueco largo". Mining manager 1, personal communication October 2010.

⁴⁸ Mining engineer, field inspection, December 2010.

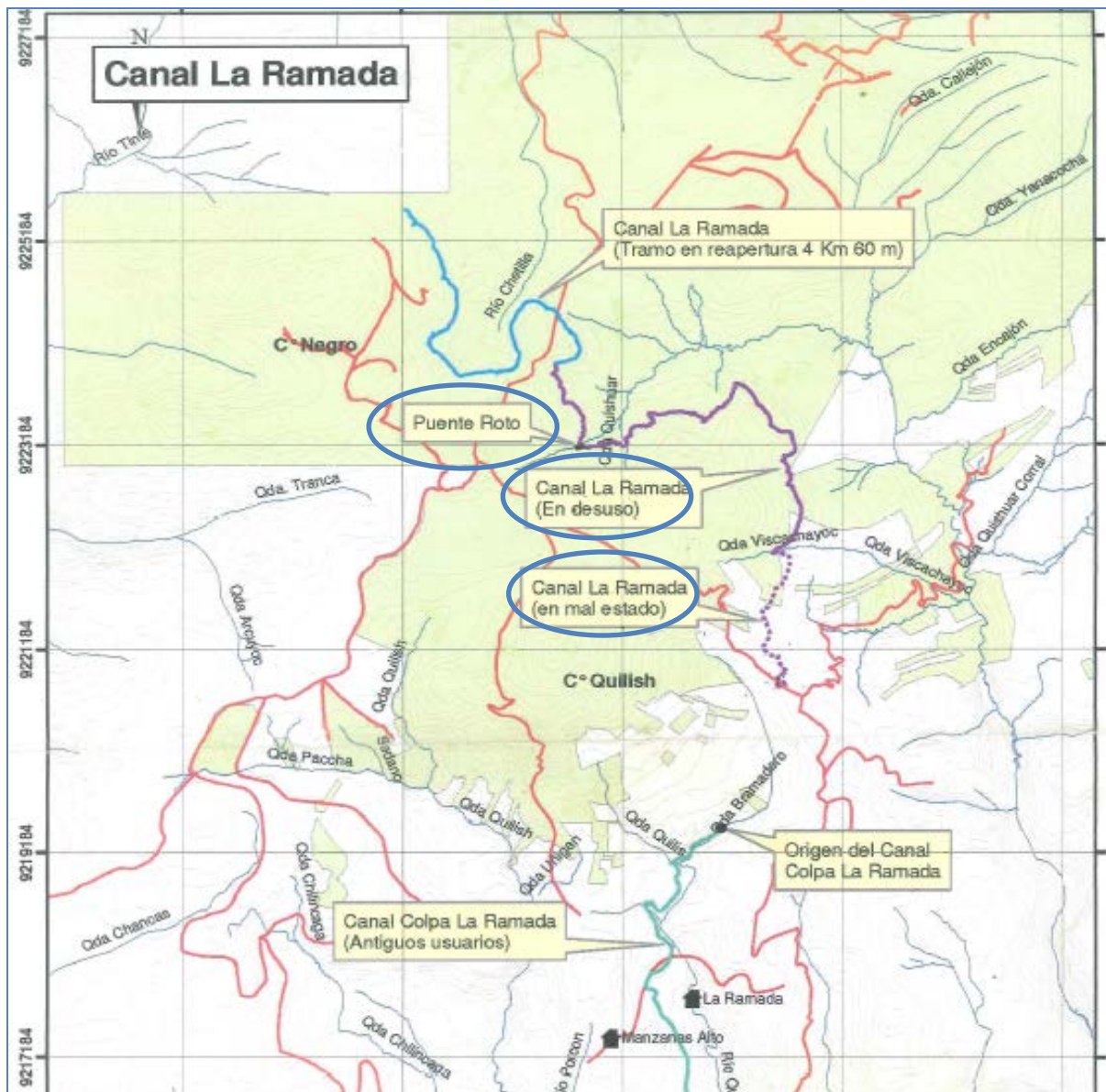


Figure 6. The La Ramada canal – Yanacocha’s version. Note: Map elaborated by Yanacocha. Emphasis –ellipses– added by the author to indicate deficiencies expressed by Yanacocha: “broken bridge, disused canal and canal in bad condition”.

In the reasoning of Yanacocha representatives, the farmers "do not really want water or do not really struggle for that, instead, what they want is money" or "to have an excuse to engage in negotiation with the mine, because of the economic benefits they might get".⁴⁹

Between 2003 and 2004 and convinced of its own rightness, Yanacocha also actively destroyed a stretch of almost 5 km of canal. When they learned about this from the

⁴⁹ Mining manager 2, personal communication April 2009.

farmers, the Regional Agrarian Office declared that the mine had acted against the water law, which states that nobody can obstruct or impede a right of way because they belong to the state. Any alterations or modifications therefore require the prior approval of the state. After having inspected the damage in 2004, the Office ordered Yanacocha to rehabilitate and fix the damaged stretch of canal.

This trouble with the Regional Office may have prompted the mine to change its strategy. Rather than continuing to attempt to gain control over the Cerro Negro waters through legal means, the company instead decided to enter into a process of negotiations with the water users. In October 2004, the mine succeeded in gathering a group of about 150 people from the La Ramada and Manzanas communities agreeing to negotiate. This group not only consisted of members of the La Ramada water user association, but also included users from a neighboring canal and even counted some people who were not registered as water users. The mining company, in an attempt to once and for all end the troubles and disputes about the Cerro Negro waters, offered some money to the community members; this money was to compensate them for the work done on the construction of the 17 km of the canal stretching from the *Cerro Negro* area to the community of La Ramada. The amount each farmer would receive was substantial: 7000 PEN (Peruvian Nuevos Soles), equalling approximately US 2000 dollars. The company even gave payments to those who had never used the water, supposedly (and as stated in the written agreement⁵⁰) because they had contributed to the maintenance of the canal. The amounts of money are huge for the inhabitants of the two communities; representing four times the average income of US 509 dollars/year – that a farmer could get in 1995 (INEI 1997) or more than an entire annual income of someone working in the town of Cajamarca in 2008 and 2009 for a minimum wage. For many of them, therefore, the offer of the mine was difficult to resist.

Yet, by accepting Yanacocha's money, people also explicitly agreed that the mine had adequately compensated them for any damage or loss they might experience as a result of the closure of the canal or as a result of the transfer of water rights to Yanacocha. Upon receiving the money, people also formally recognised the validity of

⁵⁰ Extra-legal agreement (Transacción extrajudicial, Cajamarca 19 October 2004).

the mine's water rights (and thus agreed that their own rights were no longer valid), and accepted the closure of La Ramada canal. The agreement signed upon the handing over of the money also stipulated that those who had received money would renounce from any action which would negatively affect the rights given to Yanacocha. The agreement allowed Yanacocha to empathically assert that the farmers did no longer have legitimate claim to water or to water rights⁵¹.

The agreement also worked to divide the community members, with those who had accepted the money (and in particular those among them who had never been users of water) now taking the side of, and defending, the mine and its actions, for instance by supporting the mine's claim that the canal had never conducted water or, the mine never blocked the canal. According to La Ramada inhabitants, these people were paid by the mine to do this, as "the intention of the mine was to delete any trace of the canal".⁵² The people siding with the mine also forcefully prevented others from entering the area where the canal is situated. They even stopped representatives of the water authority when they passed by to inspect the canal condition. An aggressive farmer explained: "that he does not bother the authorities at their offices, why they then have to bother him in his property"⁵³.

There are also many people who maintain that water can and should never be exchanged for money. They therefore argue that if people accepted cash, this just represents compensation for work done on the canal or for damages suffered. But: "it was not selling our water" nor the rights to water or to the infrastructure.⁵⁴ Some of La Ramada leaders also question the legal validity of the agreement, because it was co-signed by people who had never been water users and who had no relation whatsoever with the canal. According to the grandsons of Don Eusebio, and leaders in La Ramada – this agreement represented nothing else than buying users and thus buying water: "this was more than a payment for labour devoted to the canal. It was a transaction to

⁵¹ Certified letter from Yanacocha, Cajamarca 17 October 2007.

⁵² Farmer Personal communication, January 2009.

⁵³ Fieldwork inspection, December 2010.

⁵⁴ Farmers 2, personal communication April 2009.

force us to give up our water sources, the canal and the water flows".⁵⁵ Yet differing in many accounts, but determined to defend their territory and livelihoods, leaders of La Ramada approached the water authorities of Cajamarca and Jequetepeque with the request to cancel the water rights given to Yanacocha. Their argument was that the mine was using the water for mining purposes rather than for the intended drinking water purposes, thus violating the priorities for water use as established in the water law. Their request was dismissed by the authorities, on account of the fact that Yanacocha used the assigned water for drinking water of its camp site.⁵⁶

Yanacocha refused to talk with the leaders, stating that they did not legitimately represent any community or group of water users. The mining company even qualified a leader's communications as hidden threats against the mine, and warned that they would report him to the Cajamarca court of justice in case he would undertake any further action. In 2008, the leaders organised a public protest, blocking the road that connects the mine site with the city. The intention of this protest was to demand a solution and to call the attention of the media and the authorities. Instead, they were accused of causing public disturbance and of aggression against the private property of Yanacocha and brought to court. See below an example (Figure 7) of the material prepared by the communities claiming their water back to their canal.

⁵⁵ Judicial demand presented by the leaders of La Ramada to the Court of Justice from the Jequetepeque region.

⁵⁶ Res. N. 021-2008-GA-GRLL-ATDRJ., and Intendencia de Recursos Hídricos-IRH. Res. N. 769-2008-INRENA-IRH.

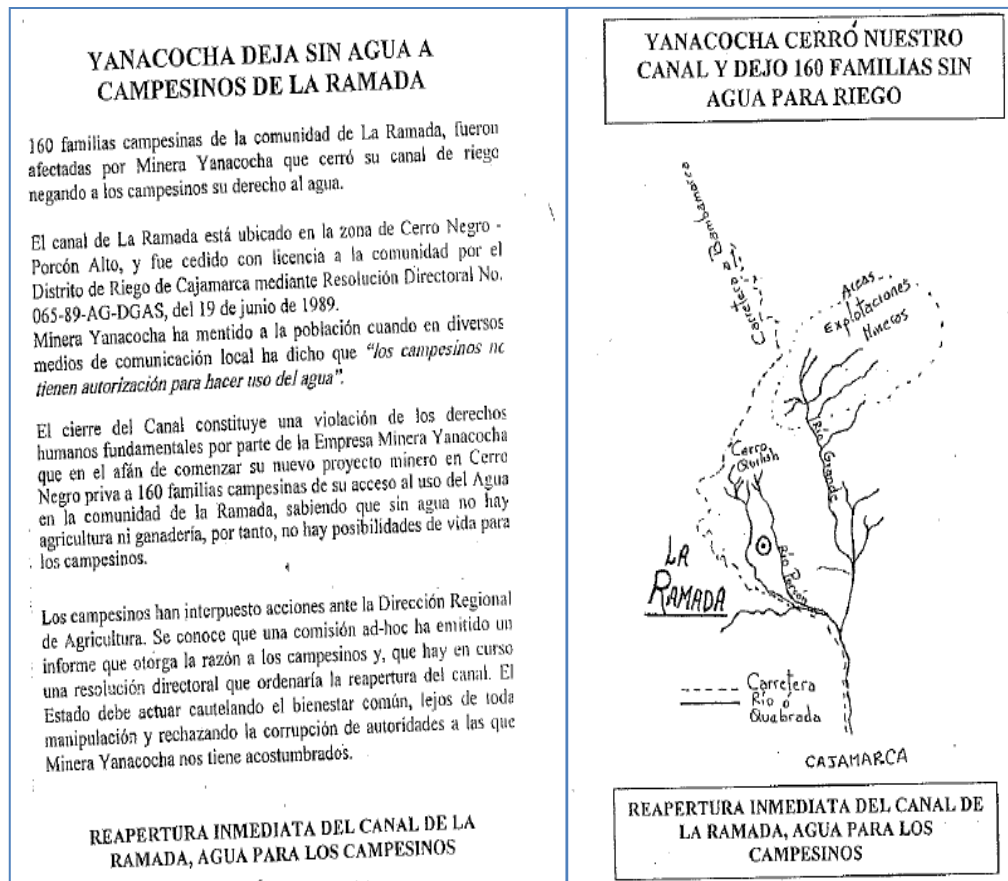


Figure 7. The La Ramada case – farmers’ version. Note: Flyers by local organizations in support of the La Ramada farmers: “Yanacocha destroyed our canal and deprived 160 families from water for irrigation. Open La Ramada again, water for the farmers”

The disputes and arguments continue until today, involving different factions in the involved communities and different government authorities. In 2006, the Ministry of Agriculture, commanded a study to determine the feasibility of the canal and the water availability in the area. Its objective would be to "give water rights – in priority – to those who were affected because of the expiration of such rights".⁵⁷ With this document, the leaders approached again the two water authorities –Cajamarca and Jequetepeque- asking them to follow up. In 2009, and responding to the Ministry command, the National Water Authority -*Autoridad Nacional del Agua ANA*- hired an independent consultant to do those studies. The conclusions (in 2010) stated that water demands exceeded water availability from May until November, but that the surplus water of the other months could be made available to farmers. The consultant’s report

⁵⁷ Res. Ministerial N. 0407-2006-AG. Lima. Ministerio de Agricultura.

also declared that La Ramada canal was not operational, and in urgent need of rehabilitation, reconstruction, and maintenance work. Among other suggestions, the report proposed the construction of a reservoir to store and supply water to the canal, and the installation of a sprinkler irrigation system.

Yanacocha disputed the study's results, and in particular questioned the calculated figures for water availability. It stated that "decisions that can be taken on the basis of [those studies] can have irreversible effects on the property rights of Yanacocha".⁵⁸ In spite of this, the water authorities decided in favour of the farmers, by approving a designated water flow for La Ramada of 1.37 L/s from May to September.⁵⁹ The authorities also stated that the users needed to make some provisions to regulate and store water in the rainy season, from October to April, and ordered La Ramada water association to rehabilitate the canal within a year's time. Although positive in principle for those who wanted to claim their water, the resolution by itself does not provide them with rights to water, nor does it allow them to construct new infrastructure. Rehabilitating the canal or constructing new reservoirs might turn out to be difficult, as some of those would have to be located on the property of Yanacocha. That the mining company will not be forthcoming shows in the fact that they already made a legal appeal against the ANA resolution (Defensoría del Pueblo 2011).

3.3.2 Case 2: The San José Reservoir

In this second case, we describe another series of encounters between Yanacocha and its neighboring communities about water. Like in the La Ramada case, here also the mining company resorted to negotiations and the payment of compensations to resolve the problems and secure its unlimited access to, and control over, the upstream water sources.

The activities of the Yanacocha mine in 2000 and 2003 in one of its open pits led to severe changes in the soil cover (due to erosion and compaction), while also significantly altering downstream water flows by disrupting the existing drainage networks and lowering the water table. Because of percolations during the expansion

⁵⁸ Letter issued by Yanacocha, Cajamarca 23.11.2010.

⁵⁹ Water availability of about 2.23 MCM/year. Res. N. 0201-2011-ANA-AAA VI MARAÑÓN.

phase of the platforms at the Cerro Yanacocha and La Quinua areas, water quality was also compromised. In addition (at the end of 2006), there were some accidents with the spill over of acid water that reached the communities. The mining company qualified most of these environmental impacts of their operations as moderate (MWH Peru 2006).

However, for water users downstream, the impact was significant, as two of the creeks that experienced the reduction in water flows were feeding five irrigation canals. One of those canals was constructed in 1953 through the collective work of 30 farmers, who had also arranged for its registration with the water authority and who together looked after its operation, cleaning and maintenance. After Yanacocha started its open pits in the two mentioned areas, the five canals only received a fraction of the water flow that they used to have. For example, in one case the water flow dropped from 80 L/s to 56 L/s and in another from 500 L/s to about 100 L/s. The affected communities complained against Yanacocha and demanded to have their water sources back. According to these communities, the impact on the two creeks and the reduction of water in their canals were not mentioned as the impacts of Yanacocha's operations in the Environmental Impact Assessment (EIA) that was approved in 1998.

In its annual reports, Yanacocha admitted that the initial operations in its pits could lead to a reduction of downstream water flows. As a solution, the company proposed getting water from another area – a complex of natural springs or lakes – by constructing a dam to store water, which could then be diverted to the affected communities. However, the communities surrounding those springs opposed these plans, as they feared the loss of their own waters. The mine then came up with a mitigation and compensation plan, in which it proposed to provide the affected communities with treated water from the mine. The proposal was that Yanacocha would collect the remaining or residual water it had used in its mining processes, next to harvesting or collecting rainwater. Before this water could be released to the affected communities, it had to be treated. As part of this plan, Yanacocha constructed the San José reservoir,⁶⁰ in an old open pit, with a storage capacity of 6 MCM of water. This

⁶⁰ An investment of US 25 million dollars.

water would be used by the mine itself, and could also be delivered to the communities. By thus releasing water, Yanacocha intended to replace the water lost because of its operations.

The quality of the treated water was such that it could only be used for irrigation and not for consumption or other domestic uses. This was why many community members were not too happy about the mine's proposal. Many people did not want treated water; they expected to receive what they called 'natural' water, as they always had. However, as one farmer leader indicated: "the only alternative was the one proposed by Yanacocha, so they gave us treated water".⁶¹ Affected users expressed dissatisfaction with the quality of the mine's water: "[Our] water sources and flows were natural before [the mine arrived], and we were drinking that water and using it for irrigation, as well as for our animals. Water was consumed without any fear."⁶² Some of the affected communities refused to use the treated water; they protested, and entered into a long judicial process against the mine, to demand a continued access to 'natural' water. However, they were not successful⁶³ and finally had to agree to receive treated water.

During 2006 and 2007 and as a part of the mitigation and compensation plan, the communities and the mine signed extrajudicial agreements. The first condition for receiving treated water was that the communities had to give up their former water rights issued by the ATDRC,⁶⁴ over the sources and flows located in the area where Yanacocha is operating. They were requested to apply for new water rights. In their applications for new rights, the communities specifically had to indicate that they are aware of, and willing to receive, treated water from the San Jose Reservoir. Through this process, the former communities' water rights were thus returned to the State administration, allowing Yanacocha to obtain them and proceed with its operations.

The process itself was contentious and full of questionable incidences, like the reduction of water amounts in the new licences given to the communities. The ATDRC

⁶¹ Farmer 4, personal communication, February 2011.

⁶² Farmers 3, written communication April 2011.

⁶³ Since there was the ongoing legal process, information about this case was restricted.

⁶⁴ Res. N. 008-2004-GR-CAJ/DRA-ATDRC. N. 009-2004-GR-CAJ/DRA-ATDRC.

issued new water rights with the quantities that users would be entitled to, even before the official agreement had been signed. For example, one of the canals that used to receive 120 L/s now only received a licence for 56 L/s.⁶⁵ The presidents of these water user associations had diligently followed the requested procedure, thereby giving up their former water rights and applying for new ones from the San José reservoir.⁶⁶ The new water rights indicating amounts and sources as issued by the water authority indicated: "this canal will conduct 56 L/s of treated water and 29 L/s from natural sources, rounding up to 85 L/s to benefit about 230 water users, mainly agricultural families".⁶⁷

What is also remarkable is the relative eagerness and ease with which the peasant leaders believed, and agreed to, the mine's discourse about the viability and sustainability of the reservoir. This can perhaps be explained by the fact that they did not have any alternative means of getting water. Also – as rumours have it – some of them may have accepted small bribes and favours from the mine.⁶⁸ A statement from one affected peasant water user association which signed an agreement with Yanacocha illustrates the ease with which they went along with the mine's proposals:

The water users agreed to renew our previous request about the nullity of our water rights issued by the water authority on 2004. The permit gave us the right to use 63.28 L/s for agriculture and livestock production, benefiting 70 farmer families...

"Currently our water user association does not use this given water flow. On the contrary, it is convenient for us to use water from the San José reservoir owned by the Yanacocha mining company, which is supplied by treated water from the mining operations. The agreement with this company is to receive 42 L/s from its reservoir into our canal and 21.28 L/s from the other natural springs... We also ask for the closing of the aqueduct of our canal and its right of way (700 m) and we give the permission to

⁶⁵ Community advisor, personal communication, February 2011.

⁶⁶ The yearly maximum amount of water to be provided by Yanacocha to this canal was agreed on 1.357 MCM.

⁶⁷ Res. N. 004-2009-ANA-ALA-C.

⁶⁸ Community advisor, personal and written communication, February 2011 and April 2012.

Yanacocha to use this part of the canal and land for the its own purposes with the condition of receiving water from San José".⁶⁹

The net result was a relatively smooth handing over of water rights from peasant associations to the mine, with the former giving up their previous water rights licences and rights over infrastructure and accepting new rights from the reservoir. Also, through these agreements and with the full acknowledgment and authorisation of the state water authorities, Yanacocha became the de facto water provider for five peasant canals, supplying water to about 1000 users. The mine is responsible for releasing and allocating a total amount of about 3 MCM, especially during the irrigation period from April to September. To assume its new duties as a water manager for the region, the mine temporally hires some workers from the affected communities. These workers, however, just operate the installations following the technical and operational instructions from the mine and have nothing to say about how or when water is released or allocated. Formally, the water authority remains responsible for establishing how much water each of the canals should receive. However, from the time the mine has taken over water provision and distribution, there has been no involvement whatsoever from the water authorities in terms of instructions or inspections.

The agreement between the mining company and the affected communities also stipulated that the company would compensate the communities in financial terms for giving up their water rights. Already, although not meant as direct compensation, the mine was financing various investment projects such as the construction of schools and roads to communities, the implementation of drinking water systems, reforestation, and employment. The more direct compensations make the transactions between the communities and the mine closely resemble a water market, in spite of the fact that the Water Resources Law 29338 expressly forbids water trading. Yanacocha paid about US 30,000 dollars to every user of a community of about 230 users. Comparing the compensations given in 2006 with the income of peasant

⁶⁹ Community Act – Cajamarca. (Acta de Asamblea comunal) November 2008 and Res. N. 008-2004-GR-CAJ/DRA-ATDRC.

families, the amounts are equal to ten times the minimum income, about US 200 dollars, of what an urban worker in Cajamarca (in 2008 and 2009) could earn (INEI 2010). In addition, the mine established a trust fund aimed at guaranteeing the continued operation and maintenance of the San José reservoir once mining operations are finished, by 2018. This fund is about US 2.9 million dollars.⁷⁰ However it is not clearly defined how and by whom this fund will be managed, and in particular whether actual water users will be involved or trained to do that.

Not all affected communities entered into negotiations with the mine, or signed the agreement. Some communities that were affected as well did not receive any attention because they refused to receive treated water. Others who were also affected lacked the necessary documents to prove their water use, flows and official water rights, which is why their complaints were dismissed by the mine and the water authorities.

The implementation of Yanacocha's proposal to deliver treated water to the affected communities implied a shift in the responsibility for water allocation. Now, this responsibility came to lie with the mining company. To the people receiving water, it was unclear how allocation would happen and who would monitor and control this. They thus requested the water authority, ATDRC, to assume this task by checking how Yanacocha released water. ATDRC never did this; it just issued water rights or licences to the communities, allowing them to use water from the reservoir, and to the mine for providing water. De facto, the mine thus controls how water is used and allocated, and it does this without informing or being checked by the users of the water authority: "the only one which knows and controls is Yanacocha".⁷¹ That users do not know how and if they can hold the mine accountable for its water services is also shown in the fact that for about 2 years, (2010-2012) the reservoir has not been functioning. Against the agreement, Yanacocha is therefore releasing water directly from its La Quinoa treatment plant. To date, the water authorities have not done anything to hold Yanacocha to its promises, and to have the reservoir repaired. Yet, the current local

⁷⁰ Final agreement between Yanacocha S.R.L. and users. Cajamarca 2009.

⁷¹ Former employee of Yanacocha responsible for releasing water, personal communication, February 2010.

water authority of Cajamarca, is critical of how water management is changing in the region:

“Water has become an element of pressure and negotiation,... in some places where mines impacted people, they paid to avoid more problems. It is a mistake [from the mines] to proceed like this,... because when negotiation take place, it is very difficult to approach [water related] problems from a different perspective... I criticised that both, the mine and the communities, negotiate with resources that are not theirs”.⁷²

In 2009, the ATDRC decided to enact a resolution acknowledging the negotiations between the communities and the mine:

“Yanacocha, a private mining company that developed exploration and exploitation activities, between 2000 and 2002 and since that time there is not water flow of about 56 L/s in an irrigation canal that used to come from two water creeks [nearby mining operations]. Because of the extraction of surface and groundwater in the open pit, the water level has reduced [and the canals cannot take it]... Now the water flows from these creeks are captured by Yanacocha and constitute part of its mining operations. [After a treatment process done by the mine, this water] and are finally stored on the San José reservoir. Because of the impacts on those [flows] and with the purpose to guarantee water provision to the canal, Yanacocha constructed the San José reservoir to store water and then provide it in a controlled basis during dry seasons”.⁷³

This statement was part of the new resolutions that the water authority enacted to the affected canals issuing their new water rights over water flows from the San José reservoir.

Yanacocha proudly mentions this plan in its annual reports as reflecting its contributions to local water management (Yanacocha 2009, 2010). During the opening of the reservoir, in 2008, the former President Alan García also celebrated and congratulated the initiative from the mine. He emphasised that such private-sector

⁷² J. Puicán, personal communication, February 2010.

⁷³ Res. N. 004-2009-ANA-ALAC.

initiatives were crucial also for the further development of agriculture, and he mentioned the reservoir as an example.

3.4 Conclusions

Our analysis elicits three important conclusions. One, large-scale mining operations such as that of Yanacocha entail major shifts in how water is used, owned and managed. Perhaps different from how most land grabbing occurs, the shifts in these cases do not occur through the open and outright sale of water. Instead, they involve long-winding, fuzzy and opaque processes of negotiation and sometimes struggle on a playing field that is far from level, with the political and financial powers of mining companies far outweighing those of the local peasant and indigenous communities. The net effect nevertheless is a thorough reconfiguration of water governance, with the mining company controlling water in the region and local communities being effectively dispossessed by losing their water rights.

Second, these shifts in water use and tenure relations imply an irreversible transfer over the control of water from local communities and government agencies to a large and wealthy private transnational corporation. This transfer not only occurs through the company's acquisition of water rights but also through its de facto responsibility of releasing and allocating the upstream water sources to downstream users. The mining company partly 'earned' the power to do this by making huge investments in hydraulic infrastructure, such as the San José reservoir. As La Ramada case shows, this creation of hydraulic property may go accompanied with the material and discursive destruction of existing hydraulic properties. The damage to, and blocking of, a canal constructed by farmers, and the active denial of its very existence were clear strategies of the mine to assert its control over the waters in its area of operation. In this sense, what happens in Yanacocha resembles a form of primitive accumulation, with water that used to be publicly or collectively owned becoming enclosed into private ownership by expelling existing claimants (Hartsock 2008). However, and different from many other documented cases of primitive accumulation (for instance in reports of land grabbing), the appropriation of water in these cases is a subtle process, with its implicit privatisation serving the extraction of gold rather than water itself becoming

a commodity. In the Yanacocha case, this involves a partly implicit process as formal rights to transfer water continue to be vested in the regional water authorities. However, in actual fact and practice, these authorities leave all responsibilities and powers to the company who thus becomes the *de facto* water management authority. The troubling question of course is how this company, whose actions are guided by transnational trade relations and capital flows rather than by localised questions of environments and livelihoods, can and will be held accountable for its actions.

And third, the impacts of these changes in water use and control are potentially devastating for local livelihoods and for future water availability. Water previously used for irrigating pastures and growing subsistence crops is now increasingly used for producing gold for export, an activity the local gains of which are likely to be short-lived, in spite of the enormous contributions of the mining company to local development. The mining company indeed destroys an existing waterscape. The longer-term social and environmental impacts of this remain poorly understood as yet. What is generally clear, however, is that many people in the rural areas of Cajamarca are left in an even more persuasive condition of vulnerability than they were before the arrival of the mine. This may suggest that for mining companies, the place and the resources are useful, but the people are not – turning them into a surplus population (Li 2010). On the other hand, the entrance of Yanacocha has opened up new opportunities for civic action, protest and resistance and has triggered new ways for indigenous groups to assert their rights and claim environmental justice (e.g. Perreault 2006). The La Ramada case is still unresolved. This shows the mining company does not automatically win and those farmers who are still struggling may yet succeed in re-claiming their water rights.

Chapter 4. Questioning the effectiveness of planned conflict resolution strategies in water disputes between rural communities and mining companies in Peru



Rondas meeting in Combayo, Cajamarca. Photo: M. Sosa.

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4.1 Introduction

Since the 1990s mining activities have considerably intensified in the Andean regions of Peru, triggering a proliferation of socio-environmental conflicts (Bebbington et al. 2008, Bebbington et al. 2010). Between 2009 and 2012, more than 250 mining conflicts have been reported. Many of these are about access to and control over land and water, and about the availability and sustainability of those resources for activities other than mining (Bebbington and Williams 2008). In many cases, paradoxically, the communities that are articulating these concerns are often the same as those who expect and demand to benefit from the social and economic development opportunities that mining activities generate in rural areas (Bebbington 2007). This paradox importantly co-shapes the nature and direction of conflict resolution scenarios: the fact that affected communities economically depend on mining companies limits their possibilities and willingness to express grievances and concerns. Often, conflicts happen within an institutional context that is not just characterized by large asymmetries in financial and political powers, but that also separates the governance of mineral expansion from that of water resources and local development. Coupled with the political prioritisation of mining development, this makes it difficult to effectively plan and regulate the interactions between mining operations and water.

Against this context, this chapter critically interrogates the effectiveness of planned attempts to solve or intervene in mining conflicts, particularly looking at whether and how these help ensure the sustainability of water resources, water-based ecosystems and livelihoods. We use selected examples of an iconic conflict, the one between the Yanacocha mining company and the rural communities of Combayo (Cajamarca), to show how conflict resolution typically happens by invoking the “authority” of law and science. The legitimacy of both importantly relies on their association with objectivity and neutrality. In other words, their strengths stems from the fact that they are designed to be non-political. We argue that the deeply political nature of mining conflicts makes it intrinsically difficult, or perhaps even impossible, to institutionally or scientifically safeguard objectivity and neutrality. This subsequently calls into question the effectiveness of the proposed technical and legal solutions strategies. In

particular, there is a danger that rather than correcting unsustainable or unjust behaviours, those in power - mainly the mining companies - use supposedly objective solutions as a legitimizing device to continue with business as usual.

We conclude that instead of trying to screen off socio-environmental mining conflicts from politics by resorting to science and law, it might be better to explicitly admit and subsequently deal with the fact that these conflicts are always inherently political and power-laden. That is to say, instead of basing solutions on forms of objective “rightness”, we suggest there is merit in acknowledging that they are always part of specific institutional contexts characterized by huge inequalities in voice and financial resources. This calls for much more emphasis on the process and power dimensions of environmental conflict resolution strategies.

This chapter is based on fieldwork done in Cajamarca from 2009 to 2011, visiting communities in Combayo: El Triunfo, Bellavista Alta, Bellavista Baja, Porvenir and Pabellón de Combayo. Information collection consisted of some 40 semi-structured interviews in Cajamarca and Combayo with farmers, local and regional authorities, consultants, researchers, representatives of state agencies, the mining company and local NGOs. In addition, 6 in depth interviews were held with presidents of irrigation canals and local authorities. Community assemblies, communal work parties, herding activities, cattle markets and judicial hearings were used many as occasions for observations, more or less formal interviews, oral stories, surveys and discussions, thus combining multiple research methods (Burawoy 1998, Manson 2002, Ranjit 2011). Grey literature formed another important source of information.

After this introduction, the chapter presents the theoretical inspirations that have informed our analysis. This is followed by background information of the case and a description of the conflict, and then an analysis of the legal and technical solutions that form important elements of strategies to deal with opposition to mining operations. As a conclusion, the chapter discusses the effects of such strategies on rural communities, disputes over water resources influenced by mining operations and the sustainability of water resources in general.

4.2 Water governance and socio environmental conflicts

This analysis draws theoretical inspiration from an emerging literature about the contested nature of environmental problems on the one hand, and from scholarly attempts to come to grips with the many entanglements between science and society on the other. As for the first, scholarship that explicitly acknowledges the deeply contested character of environmental problems has a long history. Inspired by political ecology as a way to think about “conflicts and struggles engendered by the forms of access to and control over resources and the inherent power relations in defining, controlling and managing nature” (Peluso and Watts 2001: 25), this work assumes and posits linkages between the institutional regulation of property and the organisation of society. In contrast to much conventional water-focused scholarship, it explicitly sets out to unravel how environmental planning and governance processes help reproduce social hierarchies and power relations. Hence, in political ecology terms, water governance is not just about water but also about the distribution of incomes, wealth and authority in society (Bridge and Perreault 2009). This is one important reason why water is an intrinsically political and contested resource (Zwarteveen et al. 2005, Boelens 2008, Mollinga 2008, Panfichi and Coronel 2010).

In line with this body of scholarly work, water governance can be defined as “the practices of coordination and decision making between different actors around contested water distributions” (Zwarteveen 2015: 18). Such practices are thick with politics and culture, are linked to creative processes of imagining and producing collective environmental futures, and combine political problems of scale (spatial, ecological, administrative, temporal), with problems of coherence (the durable alignment of different people and different waters despite problems of incommensurability and political tensions) (Bridge and Perreault 2009). The implication of this perspective for water conflict resolution, the topic of this chapter, is that it can never be just a technocratic exercise, but should always engage with issues of (the organisation of) power and politics.

Socio-environmental conflicts materialize when disagreements and contestations between different groups within society around natural resource (e.g. water)

distributions, or the allocation of risks and hazards (Muradian et al. 2003), cannot be solved in a manner that is agreeable to all parties involved (Edmunds and Wollenberg 2001). Such conflicts are symptoms of inadequate or ineffective political processes, as much as they signal problems of a more technical nature. This brings us to the second source of theoretical inspiration for this chapter, the literature on the entanglements between science and society. Because water is always contested, water (management and governance) questions cannot be resolved by just referring to 'objective', scientific information or analyses, but also involve matters of opinion and choice (Zwarteveen and Boelens 2014) and have to do with interests and values (Muradian et al. 2003). Thus to intervene in water conflict situations, scientific accounts of reality cannot be dealt with as an objective 'black box' separated from the context and from the political and social issues they are immersed in. On the contrary, pretensions of scientific objectivity and neutrality risk being purposively used to screen contentious question off from explicit deliberation (Castro 2007). As Li (2007) argued, questions that are rendered technical, are simultaneously rendered non-political.

This chapter combines these insights about the intrinsically contested nature of water and the impossibility of separating politics from scientific or technical forms of knowledge as a framework to assess the effectiveness of conflict resolution strategies in mining areas in Peru. To summarize, we consider these conflicts as more-than-technical in that they are indicative of wider power imbalances. These conflicts emerge when two or more actors or organizations compete for control over or access to water, and may evolve around issues of quantity, quality or opportunity (Pereyra Matsumoto 2008). Urteaga (2011) thus aptly refers to these conflicts as expressions of political processes, with prevailing power relations co-shaping relations between the actors involved and their relations with water.

4.3 Background of the area and the conflict

4.3.1 The highlands of Combayo

Combayo, a rural town located in Cajamarca, has been the setting of a sequence of socio-environmental conflicts involving farmer communities and the gold mining company Yanacocha as main actors. During the period of the hacienda, this rural town

was known as the Hacienda Combayo. It formed one of the important estates in the northern region.⁷⁴ Today, about 13 of the 21 *caseríos* or communities of Combayo are located within the area under direct influence of mining operations determined by Yanacocha. Between 1992 and 1996, the company acquired about 4069 ha from 41 Combayo farmer families, land that it needed to start operations in Cajamarca (Pascó-Font et al. 2003). The combined effect of these sales and population growth is that at the time of this study, most land holdings in Combayo were small individual *minifundias*, ranging in size from 0.5 to 2 ha (INRENA 2007). Here, like elsewhere in Cajamarca, the main economic activities are livestock and dairy production, together with some small scale agriculture. For instance, surveys conducted in El Triunfo, one of the communities of Combayo, revealed that livelihood activities consisted mainly (76%) of small-scale farming and dairy production, with temporal employment at the mining site complementing families' incomes.⁷⁵ Farming and dairy production in Combayo rely on irrigation water that comes from streams or creeks fed by water from the Azufre River, a tributary of the Chonta River which is part of a river basin of about 34,531ha.⁷⁶ Assessments conducted during 2006 and 2007 by MINAG and sponsored by Yanacocha, concluded that agricultural yields and dairy production in Combayo were lower than in other areas in Cajamarca province. The study attributed this to low quality seeds, lack of proper soil fertilization, and inadequate farming practices. However, it also mentioned the lack of water for irrigation, or the lack of water security in the area, as a reason for low productivity (INRENA 2007). A comparison of the water requirements of the existing farming systems in the watershed with water availability in the area reveals water shortages of about 38 MCM between May and

⁷⁴ This hacienda was property of Eloy Santolalla, well-known in the area for his mining activities in other areas of Cajamarca (Santolalla 1906). The Land Reform of 1969 affected and dissolved this hacienda, like many others in the region.

⁷⁵ Because of the proximity to Yanacocha, many households in Combayo rely on employment with the company. Usually farmers are hired for short periods of time (3 to 6 months) as unskilled workers. During the development of the mining operations in the region, and encouraged by the company, farmers also created small community or communal companies to provide services to Yanacocha.

⁷⁶ Together with other rivers -Grande, Quinuario and Paccha- the Azufre River forms the Chonta watershed. The Chonta River is about 39.8km long and together with the Mashcon River feeds into the Cajamarquino River, one of the most important rivers in the region (Nippon Koei 2010).

October. Availability of water for irrigation is lowest and most critical in August (CEDEPAS 2009), but water shortages can last for about 8 months of the year.

Water is conveyed into to the fields through a network of rudimentary canals. Some of these were constructed during the hacienda period, while others were dug more recently by farmers. Of the 8 farmer canals in Combayo, about 3 were directly affected by the mining operations of Yanacocha at the Carachugo site: Azufre Ahijadero (conveying about 100 L/s), Azufre Atunconga (150 L/s) and Azufre Ventanillas de Combayo (160 L/s), with a total of approximately 357 users and 885 ha of irrigated areas impacted (Mendoza Moreno 2008). To manage the irrigation canals, farmers have organized themselves in water users associations, one *comité* for each canal. Some of them, like El Triunfo, hold official water rights given by the state. The associations are registered with the local water authority in Cajamarca⁷⁷ and led by a canal-president, who is responsible for distributing the available water supply, establishing the rotation schedule for the delivery turns and organizing maintenance work. These canal-presidents also play a key role in mobilizing farmers in times of water disputes. They are the ones who speak for and represent the irrigators in the outside world. Their powers, means and resources to protect their canal's water rights are nevertheless limited (Sosa and Zwarteveen 2012).

Before going into a more detailed description of the conflict, we briefly introduce the main features of the mining company. Yanacocha is a joint venture of the Newmont Mining company (USA), the Buenaventura mining company (Peru) and the International Finance Corporation a member of the World Bank group. It started operations in the region of Cajamarca in the 1990s. The mining concession of Yanacocha in Cajamarca consists of about 25,000ha. The company operates a complex of open pit mines, consisting among others of four leach pads and in situ processing facilities. Yanacocha's gold production for 2012 was 1.35 million ounces (Newmont 2012). Of all the mines operated by Newmont, Yanacocha is considered the most

²⁴ The irrigation canals of this river basin belong to the Chonta Water Users Association (Junta de Usuarios del Río Chonta - JURCH). The users associations from Combayo, however, are not formally part of the JURCH, because the fees asked by the JURCH (between 30 to 40 soles) are too high for them and farmers do not feel that the JURCH works for their benefit (Mendoza Moreno 2008, CEDEPAS 2009).

profitable (Bury 2004). During the years of mining operations and because of its performance and expansion plans, Yanacocha faced countless cases of socio-environmental conflicts (see Bury 2002, Deza 2008, Lingán 2008, Arana Zegarra 2009, Guardia Nogales 2011, Sosa Landeo 2012, Zavaleta 2014) with several of the about 100 communities neighboring its area of operations (Yanacocha 2008).

4.3.2 Socio environmental conflicts in Combayo

In 2005, farmers and authorities from Combayo started opposing the expansion of Yanacocha mining operations. They were particularly against the Carachugo II expansion project: an open pit about 150m in diameter and 180m deep, in the high areas of Combayo. Yanacocha had obtained the authorization from the Regional Agricultural Authority (which also was responsible for water at that time) to use sources that were also used to supply water to Combayo. The mine had also obtained authorization to construct a dam in the Azufre river. *Comuneros* were concerned that the mine's uses and manipulations of water flows would negatively impact the quality and quantity of water available in the sources that fed this river, which in turn would have implications for their irrigation water.⁷⁸ In particular, 3 lakes were going to be compromised: Corazón, Patos and Estación 1.

The farmers and communal authorities mobilized to launch a collective complaint to the Agriculture Authority in Cajamarca against the authorization given to Yanacocha. In support of the claims of the population, the Agriculture Authority agreed to revisit its authorization. Yanacocha, fearing an obstruction of its plans, reacted by engaging in conversations and negotiations with some Combayo representatives. The mining company succeeded in reaching an agreement with these representatives, in which it promised to protect the water sources of Combayo.

In spite of this agreement, however, communities of Combayo in the Azufre watershed, and particularly in the area of direct influence of Yanacocha, began noticing changes in the water flows in their canals after Yanacocha had started its

⁷⁸ Interview by Alicia Abanto Cabanillas (commissioner from the Cajamarca Ombudsman office), with Luciano Llanos (mayor of Combayo at that time), and the main leaders of Combayo, 02.08.2005.

operations: “*the water was different*”.⁷⁹ After they irrigated their grass it changed colour: “*it got yellowish*” and the animals which drunk this water got sick. They also noted a reduction of water flows. As Yanacocha's operations happen in the upstream areas of the Azufre river, nearby the three lakes, *comuneros* did not hesitate to attribute the reported changes to the mining operations. Farmers' discontent and anger with the company were also fed by the collapse of the dam that Yanacocha was building on the Azufre River this damaged farmers' plots and crops.⁸⁰

Led by the presidents of the water users associations, irrigators decided to stage an organized campaign to demand Yanacocha's compliance with the promises it had made in 2005. The first days of August 2006, around 600 people from the affected areas (Bellavista Baja, Bellavista Alta, El Triunfo, Porvenir and Pabellón de Combayo) headed for two of the Yanacocha mining sites - the Chaquicocha open pit and the Carachugo mountain - to protest (see Figure 8). They were repulsed by the security company of Yanacocha and the police officers the company had hired to protect the mining site, who used tear gas and guns to stop the protesters.⁸¹ In the confrontation, Isidro Llanos, a farmer from the community of El Triunfo, was hit by one of the bullets and died. During the ensuing turmoil, two workers of Yanacocha were taken by the farmers. Yanacocha interpreted this as a kidnapping, and held two farmer leaders responsible.⁸²

⁷⁹ Group discussion farmers, Bellavista Baja, April 2009.

⁸⁰ This dam was constructed to prevent the mine sediments from obstructing the canals and water flows, but the people thought it was going to be for securing and increasing water quantity in the area. Personal communication farmer leader April 2009.

⁸¹ For a discussion about Peruvian national police being hired by private mining companies, see Kamphuis (2012).

⁸² The Peruvian legislation considers kidnapping as a complex crime, with a punishment of imprisonment between 20 and 30 years (Sala Penal Cajamarca 2010).

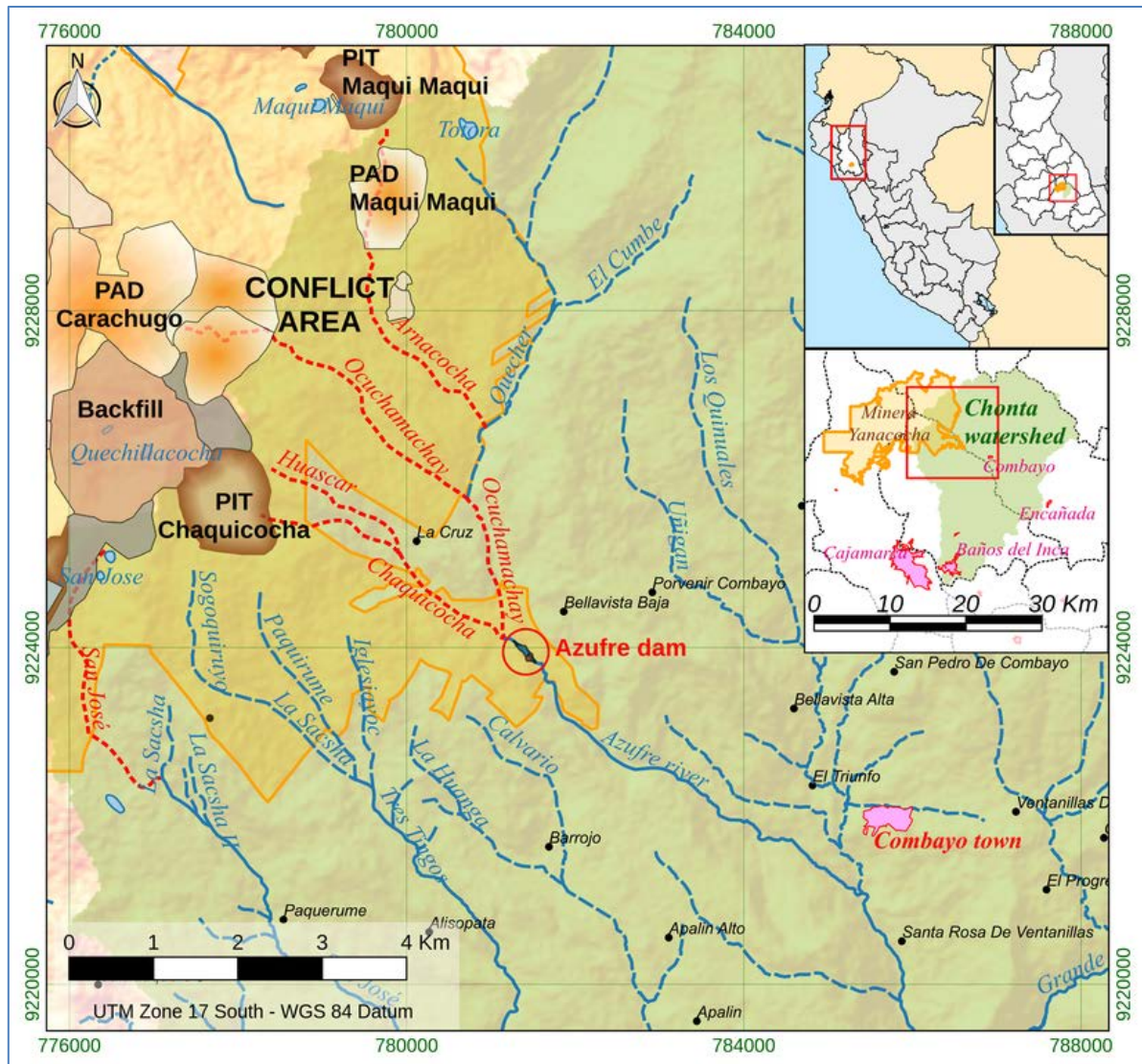


Figure 8. The conflict area and the impacted creeks in Combayo, Cajamarca. Designed by C. Cerdán (based on Gobierno Regional de Cajamarca (2011) and La República (2006)). Note: The figure shows the location of the conflict area within the borders of the Yanacocha mine site, the creeks impacted by mining operations (in bold dots) and the location of the Azufre river and the dam. It includes the town centre of Combayo as well as the other urban centres like the city of Cajamarca scaled to the Chonta watershed and to the total area of the mining company.

Right after the protest, the mayor of Combayo joined with some other authorities in attempts to arrange meetings between the farmers and Yanacocha to discuss about the impacts of its operations on water. According to them, however, all their initiatives were unsuccessful. This is why they decided to revert to less peaceful means. For about 20 days, they blocked the main access road to the mining site, preventing Yanacocha from operation as usual. In the media, representatives of the company stated: *Because*

of this conflict, Yanacocha has decided to stop operations at the expansion project".⁸³ The vice President of Newmont in Latin America, Carlos Santa Cruz, announced that this would represent a loss of about US 700,000 dollars for the Peruvian state and about US 2 million dollars for the company.

The continuous tensions in Combayo, the blocking of the road and the company's announcement that it would stop its mining operations in the region, aroused the attention of the central government. Even the Prime Minister, Jorge Del Castillo, intervened. He decided to personally help solve the conflicts by mediating between the farmers and the company (Villar et al. 2006). His intervention resulted in a public meeting in September 2006, one month after the conflict, in which the Peruvian government, the company and the authorities of Combayo signed an agreement, the so-called *Acta de Combayo*.⁸⁴ This agreement consisted of a whole menu of solutions to the water problems in the area, ranging from assessments and management plans to promises of work and investment projects. In addition to those agreements, the meeting was also used to explicitly and formally obtain Combayo's promise that it would stop opposing oppose the development of mining operations in the area.

Satisfied by this outcome, Yanacocha stated that dialogue is the only way to understanding and development "What started as a conflict ended in an agreement for mutual support, inclusive dialogue and long-term development plans."⁸⁵ The farmers, however, were less satisfied. Especially those from the affected communities were suspicious about the outcomes of the negotiations.

⁸³ Different representatives from communities, civil society organizations, the private sector as well as the government argued that the Combayo conflict was more about communities' attempts to get more economic benefits from the mining company, than about water and the environment. Years after the conflict, a representative of Yanacocha commented: "The conflict in Combayo was an extortion, the trigger was not water but employment". Personal communication, December 2010.

⁸⁴ This meeting brought together high level authorities, such as the ministers of Agriculture, Energy and Mining, Health, Economy and Finances; five representatives of the parliament; the president of the regional government; the mayor of Cajamarca; the mayor of the Encañada district; about fifty representatives or leaders of the caseríos of Combayo and four representatives of Yanacocha (Málaga Málaga 2006, Villar et al. 2006).

⁸⁵ Yanacocha's communication (<http://www.yanacocha.com/>, accessed 2009).



Figure 9. Reaching agreements: Company – state – community. Drawing by Erwin Dijkhoff

The following sections present a more detailed analysis of these negotiations. The analysis shows that the conflict resolution strategies favoured by the mining company and state officers importantly rely on legal and technical (or scientific) forms of authority. As noted, the conflicts took place in a context of large financial and political power asymmetries. Indicative of this is that Yanacocha had agreed to make 'social' investments of about US 1 million dollars in 2007 and 2008 in Combayo. The communities that (hoped to) benefit from this support (with sprinkler irrigation systems) were also the ones that complained that their water sources were deteriorating because of the mining operations.⁸⁶ The economic dependence of the communities on the company obviously weakened their bargaining power, and negatively affected their ability to hold the company accountable for its water actions.

4.4 Invoking legality: Operating according to law

For the mining company (often in combination with some government actors), a first important and powerful strategy to deal with communities' complaints and reduce tensions is to convince all involved that everything they do is within the law. The reasoning is that if something is legal, it must be right, even if it is clear that this legal rightness says little to nothing about its social or environmental integrity.

⁸⁶ Personal communication Yanacocha's former worker, March 2012.

Mineral expansion projects like Yanacocha's Carachugo project have to comply with more than a dozen of regulations and norms to get a license to operate from the state (Torres 2007). A large number of government authorities such as the ministries of energy and mining (MEM), agriculture (MINAG), environment (MINAM), as well as the local and the national water authorities have thus been involved in granting Yanacocha the permissions to operate. Such permissions were given, among others, for accessing and collecting water, as well as for its extraction, management, treatment and disposal (MWH 2012). Also, and as part of the requirements established by the Peruvian environmental legislation, environmental impact assessments (EIAs) have to be publicly presented and discussed.⁸⁷ For the Carachugo expansion project, this took place in meetings organized by the MEM in Cajamarca in 2003 and 2004. These meetings happened with the help of private consultancy companies, who informed the general audience of the actions that Yanacocha would be developing in the area. After these public hearings in Combayo (December 2003) and in Cajamarca (January 2004), the EIA was approved. The MEM considers these public hearings to be processes of consultation and public participation. The mere fact of having organized them is enough to comply with the law. However, it is debatable whether these meetings are effective in terms of communication.⁸⁸ As is also shown below, many people from Combayo -authorities as well as farmers- were not properly informed regarding how mining operations would affect their water resources.

In 2008, Yanacocha wanted to develop mining operations at the Carachugo Mountain, compromising the areas of the Ocucha Machay and Chaquicocha Creeks, tributaries of the Azufre River. These operations, as well as previous hydrological and

⁸⁷ The EIAs are prepared for the mining companies by consultant companies visiting the areas to be mined. During the presentations of the EIAs, these consultants inform the population about the activities to be developed by the companies during operations.

⁸⁸ During fieldwork and together with representatives of the Ombudsman office, M. Sosa attended a public hearing of an EIA for large mining exploration activities in Cajamarca. The representatives commented that perhaps the technical language used to explain environmental and water issues during the hearing made it difficult for many of those present to understand what was explained. Because income issues were more tangible and easier to grasp, some of them seemed less interested in environmental and water issues and instead started talking about issues of employment generation. From the questions posed by the public, nine were about water issues and more than 20 related to employment. For a discussion of the limitations of these public hearings as participatory events, see: Li (2009) and de Echave et al. (2009a).

hydrogeological studies done by Yanacocha, were authorized by the water authority and the MINAG through the following administrative resolutions: 051-2008-INRENA-IRH and 367-2008-INRENA-IRH. These stated that “[Yanacocha was authorized to execute] *surface draining works at the influenced area of the Los Patos, Corazón and Estación 1 Lakes at the Ocucha Machay Creek to facilitate the expansion of the ... leaching pad at the Carachugo Project*”⁸⁹. Having all the authorizations made it seem as if everything was agreed for the company to proceed. Yet, not all were in favour of the mining company's plans. The deputy governor of Combayo, for one, complained against Yanacocha, arguing that the people of Combayo had not been informed about these works. They were particularly upset about the fact that they had not given any authorization to the company to proceed with drying out Combayo's water sources.

According to deputy governor, the EIA did not contain any clear reference to or information about the removal of lakes. The only answer from the representatives of Yanacocha to the complaints was that they had duly complied with all the legal requirements, met all the regulations and had obtained all the permissions needed to proceed since the approval of the EIA in 2004, a process that was validated by the local authorities of that time. They also referred to the authorization given by the National Water Authority resolution approving hydrological and hydrogeological studies and drainage plans in the area of the lakes.

Besides letters to the local representatives of Yanacocha, the deputy governor issued a letter to the highest representative of Newmont in Latin America.⁹⁰ In the letters, he expressed his discomfort regarding the lack of communication from the company about the drying out of the lakes. He mentioned that those actions were not communicated to the population and that when he had asked for explanations, the response was merely that they “*are not doing any work that does not have all the permissions of pertinent authorities and with the full acknowledgment of the population*”. Arrogantly, the company added that they could do as they pleased within their concession. According to the deputy governor, if there was an authorization given by the population, this

⁸⁹ Res. N 051-2008-INRENA-IRH and Res. N. 367-2008-INRENA-IRH.

⁹⁰ Deputy governor of Combayo letter N.009 and N.010, CPM-Combayo, May 2008.

must have been given in a dubious way, without those granting the authorization realizing what they were doing.⁹¹

In addition to permissions or authorizations given by the state, the law also requires that companies get permission to operate from the communities and their authorities. How this community approval should be obtained, however, remains vague and questionable (Li 2009). Commenting on communities approving documents and actions, a Cajamarca regional officer told the story of the leaders of Combayo signing a document thinking that it was a simple request for a regular inspection of the headwater areas to be done by the Cajamarca Water Authority (ATDRC). They did not realise that the document would to be used as an authorization to dry out the lakes: *"The signatures (of the authorities) were for the inspection of the lake area, not for making them disappear!."*⁹²

As part of the agreement signed by the state, Yanacocha and Combayo, the company promised not to make any more legal accusations against the farmers. The farmers and communities in turn had to state that they would not oppose mining operations in the area. However, the farmers from the affected communities that organized the protest commented that little was achieved for their areas in terms of environmental conservation, water protection and socio-economic improvements. According to them, they came out of the conflict worse off than they had entered it: with the death of Isidro Llanos, and the anxiety provoked by the judicial case that followed the conflict. *"The people fear that they will be judicially denounced by the [company], the judicial processes have restricted people."*⁹³

⁹¹ He commented that "precisely the days that the personnel of Yanacocha was drying up the lakes in the headwaters area ... the mine organized together with our mayor ... a music parade which included folkloric artists". Presumably his intention with this comment is to notice that water issues were blurred by other activities that were organized in Combayo at the same time.

⁹² Personal communication, April 2009.

⁹³ Personal communication with one of the judicially denounced farmers, March 2009.

4.5 Invoking science: Technical knowledge supporting operations

A second important strategy of Yanacocha in alliance with the Peruvian state to solve conflicts is to rely on scientific expertise to produce supposedly objective assessments of how mining will affect the quantity and quality of water flows.

As mentioned earlier in the chapter, small-scale agriculture, livestock and dairy production constitute the permanent livelihood activities of rural households in Combayo. Those activities crucially depend on the availability of water in the canal networks that are fed by water from creeks and the Azufre River. That MINAG and Yanacocha are well aware of the criticality of local water resources for sustaining rural livelihoods shows in the assessments conducted (by MINAG) during 2006 and 2007 (and sponsored by Yanacocha), which both refer to the lack of water security to explain low agricultural productivities (INRENA 2007).

When the first incidents of conflict happened in 2005, with Combayo opposing the expansion plans of the company, Yanacocha was prompt to initiate negotiations. Yanacocha's quick success in reaching an agreement with the mayor of Combayo "*for joint work towards development and the protection of water quality and quantity in Combayo*" largely happened because many in Combayo hoped the agreement would lead to improvements in water availability and security.⁹⁴ The agreement consisted of promises to: (1) support the implementation of a drinking water supply system for Combayo; (2) preserve the water sources of Combayo; and (3) develop social investment projects in the town.⁹⁵ This was the first agreement signed by the company. As noted, many *comuneros* were of the opinion that it was not respected, and this is what prompted the conflict of 2006.

The mediation process that followed the conflictive events of 2006 again ended with an agreement in which the state, in coordination with Yanacocha, promised to implement drinking water systems for the town of Combayo and its communities. In

⁹⁴ Letter N. 009 CPM-Combayo, May 2008.

⁹⁵ Yanacocha offered US\$ 1,500,000 to invest in Combayo, and the municipality arranged lists of people and companies from Combayo to work for Yanacocha. Agreement documents from 15 and 20 September 2005.

addition, the agreement stipulated that the Prime Minister would commission a water management study to be implemented at the river basin level. The idea was to assess and determine the water quality and quantity in the area and propose the best and most efficient ways to protect water resources and ensure water supply for Combayo for drinking and irrigation purposes. To develop these studies, the government engaged funds from the Inter-American Development Bank. The international consulting company Nippon Koei was hired to carry out these water studies in the Chonta and Mashcon watersheds within 10 months. The consultants proposed several actions to manage water at the watershed level. These included the construction of a main reservoir (42.5 MCM) on the Chonta river to secure water for Cajamarca and irrigation for downstream areas of the watershed. They also proposed the construction of two minor reservoirs (about 1.5 MCM) at the upper side of Combayo to secure water for the Azufre watershed.⁹⁶ Other proposed interventions in this regulated system included maintenance work of the irrigation canals and installation of water measurement devices (Nippon Koei 2010).

The study was finished in 2010. It is now available online on the national water authority's website. Although they reduced the tensions, neither the agreement nor the post conflict water study proposed interventions that would guarantee or improve the longer-term sustainability of water resources. They also had little resonance in the conflict area, as the agreement did little to influence what happened with the 3 lakes, nor did it propose solutions to the problems of water depletion in Combayo. Instead, improvements seemed to depend on each community's political agency, its networks and its lobbying skills, as well as their success in mobilizing external funding from the company or other sources.

After the signing of the agreement, and during the preparations for the studies, Yanacocha proceeded with their actions in the Carachugo site. This entailed the

⁹⁶ In other part of the study, however, the proposal of constructing up streams reservoirs was problematic because this would affect water availability for downstream areas. The proposal of developing minor reservoirs is not new. Previous studies developed by the Water Authority in Combayo already proposed that alternative, but with differences concerning the selection of water sources.

draining of areas at the Ocucha Machay and Chaquicocha creeks of about 412 ha and 685 ha respectively. In May 2008, and in spite of the ongoing studies, the company also communicated to the water authority ATDRC that it would begin with the removal of the 3 lakes. The ATDRC approved those actions and specified that the company would have to mitigate the reductions in water availability by releasing treated water, suitable for irrigation and animal consumption, to the creeks. To mitigate impacts at the Ocucha Machay creek, the company would have to release water permanently (minimum discharges of 5 L/s in 2007, 15 L/s in 2009 and 35 L/s from 2011 onwards). Compliance with these agreements was to be controlled by the ATDRC.

On paper, these agreements sounded reasonable, even though they do not include any concern about the longer-term sustainability of the water-based ecosystems. Yet, the capacity of the ATDRC to actually monitor and enforce them is highly doubtful. In fact, its little involvement during the Combayo conflict, its poor track record in managing water resources in the area (Caballero Martin 2012) and its lack of credibility and legitimacy among affected communities (Sosa and Zwarteveen 2012) seriously call into question whether the ATDRC will be able to make Yanacocha keep its part of the agreement or hold the company accountable for the impacts of its operations (Sosa and Zwarteveen 2014). Some have suggested that the monitoring could also have been done by the technical committees established in 2000 by the ATDRC and appointed to assess and monitor water in areas where Yanacocha operates. However, because the technical committees are financially sponsored by the company, they have little credibility in the eyes of the rural population (Orian 2008).

The quality of the water assessment studies themselves is likewise the subject of serious doubts and questions (Orian 2008). As part of the Yanacocha' expansion plans for the Carachugo site, the company carried out a water assessment study. This study characterized the 3 lakes that would be affected as intermittent (or non-permanent), reducing their significance. The study indicated that the Patos lake had a water volume that varied from 5135m³ during the rainy season to 2868m³ during the dry season, and

that the other two lakes were basically empty during the dry season.⁹⁷ The deputy governor of Combayo considered these findings as a strategic way to dismiss the relevance of the 3 lakes; it allowed the mining company to convince some leaders of Combayo that there was no water in the lakes. He stated apprehensively, *“The authorities supported the mine’s version in exchange of money, and there is going to be a leach pad in place of the lakes!”*. The deputy governor was also disappointed and suspicious about the role of the ATDRC, because the water inventories elaborated and updated by this authority in 2007 did not mention that the 3 lakes were not registered. This omission, according to him, made it easier to forget about these waters.⁹⁸

The representatives of the mining company countered the worries of the deputy governor about water availability in Combayo and the performance of Yanacocha by emphasizing the fact that there are water studies being carried out in the area by a renowned international consultanting company and financed by the Inter-American Development Bank.

4.6 Conclusions

Although some *Combayinos* received benefits from the company, like temporary work or assignments for their communal companies, many things regarding local development in Combayo remained as they had been before the conflicts. In particular, nothing happened to better protect the water resources of Combayo: in spite of the promises and agreements, the mining company's operations depleted the three lakes that were at the centre of the conflict.⁹⁹ In the process, the communities lost faith in their collective ability to alter the course of mining events. Instead of the risky strategy to collectively mobilize to protect their water resources, they had come to appreciate that directly and individually dealing with the mining company to secure funding for their water projects would be more effective, at least on the short-term. Conflicts

⁹⁷ Communication from Yanacocha to the ATDRC requesting the approval for hydrological and hydrogeological studies of the Patos and Estación 1 lakes and approval for a draining plan, 11.03.2008.

⁹⁸ Personal communication, 22.03.2009.

⁹⁹ Yanacocha releases treated water to the creeks and the Azufre river as it is stated in the permissions given by the state.

indeed seemed resolved, but the underlying problems of environmental integrity and livelihood security are not.

To deal with the conflicts surrounding the activities in the highlands of Combayo, the government of Peru and Yanacocha importantly relied on two strategies. First, they made sure that what the company proposed to do was legally right, or just by obtaining all required permissions. This allowed the company to respond to complaints by simply stating that it was operating within the law. Second, Yanacocha made sure that what it did was scientifically sound, by conducting scientific impact assessments and proposing technical strategies to mitigate the impacts on the environment, particularly water. Yanacocha proposed for instance to compensate for depleted water sources by installing water treatment plants and by releasing treated water to communities suffering from the depletion. Together, these two strategies lent legitimacy to the company's operations by making them seem morally and scientifically sound. Indeed, the discussed examples show that legal compliance (justice) and technical (or scientific) accuracy function to legitimize mining operations, allowing the company to proceed with business-as-usual without having to take seriously the demands of ecosystems or communities. Rendering water problems legal and technical thus conveniently transforms them into problems that can be solved. It simultaneously renders them non-political (Li 2007).

How this is problematic can perhaps best be illustrated with the example of the water assessment study that was proposed by the state as part of its conflict resolution strategy. Interestingly, the final report explicitly mentioned that its outcomes were dependent on how the problems were framed and by whom. According to the report, the fact that there were different parties involved with diverging views and opinions made it difficult if not impossible for the report to meet everyone's expectations:

“since the launch meeting in June 2008, it became apparent that there were – different– and conflicting expectations among the actors [and] about the importance and the value of the study. As stated in public meetings, the city of Cajamarca and the water users [of the Chonta watershed] expect the report to justify the need for a large

dam in the Chonta watershed to provide water not only for the city of Cajamarca, but also to extend the irrigated areas close to the city. Exactly the opposite idea was echoed by the highland water users [Combayo and those nearby the mining operations], who hope that the study will emphasize the need for numerous reservoirs in the upstream areas of the watershed [to secure water for them]. [This action, however] would have a direct negative effect on the amount of water that reaches the downstream areas" (Nippon Koei 2010: 142).

The consultants thus acknowledged that, although they had made efforts to make the study as participatory as possible,¹⁰⁰ the fact that different parties had widely diverging and sometimes opposing views made it difficult to fully involve them and their interests: *"although an important mobilization of public opinion and information have been generated, a [comprehensive] response of actors' proposals has not been achieved, [nor have there been] organizational actions that could allow to work with a [legitimate] representative in the study area..." (ibid: 142).*

The report clearly showed how problems were articulated differently by different actors. Its interviews revealed that many *comuneros* and the authorities representing them wondered whether *"the study would produce more water for the users, particularly from the upstream areas"* or be *"just another study"* done in the area (Nippon Koei 2010: 134).¹⁰¹ Hence, while the mining company could use the study as an objective statement of fact, the very consultants conducting it were aware of its partiality. They were worried about the effectiveness and value of their own report, because they were conscious of the impossibility of screening off their analysis from the political context in which it was conducted.

This example serves to underscore the more fundamental point about the success of water conflict resolution strategies that we want to make. We have argued that the

¹⁰⁰ The document states that several information meetings and water quality monitoring were done with participation of Combayo's population as well as with public and private organizations of Cajamarca.

¹⁰¹ Since the 2000s, there were several water assessments done in Cajamarca (and in Combayo) by national authorities (see INRENA, 2007) as well as by international bodies. For example, the Office of the Compliance Advisor/Ombudsman CAO of the IFC (CAO 2007) commissioned a water study in the area to the company Stratus Consulting in 2003.

complex and deeply political nature of mining conflicts makes it difficult or perhaps even impossible to institutionally or scientifically safeguard objectivity and neutrality. Our analysis shows that there is a danger that rather than correcting unsustainable or unjust behaviours, supposedly neutral or objective solutions work and are used as a legitimizing device for those in power (in this case the mining company), to continue their business as usual.

Hence, rather than relying on forms of 'objectification' (law, science, technical solutions) that deny (eliminate, erase or render invisible, see Edmunds and Wollenberg (2001)) the intrinsically political nature of conflicts, water conflict resolution strategies should be much more explicitly concerned with the question of how to democratically organize political decision making processes, including the question of how to organize possibilities of objecting. This goes much further than public hearings and stakeholder engagement. It also requires thinking beyond quick solutions (Himley 2014) or reaching short-lived forms of consensus, both of which tend to blur the diversity of positions and mask abuses of power (Edmunds and Wollenberg 2001, Moreyra and Wegerich 2006, Castro 2007). Rather than seeking to neutralize differences in position and power, our analysis suggest that the longer term sustainability of livelihoods and ecosystems may be better served by openly accepting and dealing with such differences, and by learning to acknowledge that experiences and knowledge (including science) are always contextually embedded and plural.

One implication is that effective environmental conflict resolution and water governance strategies should pay more attention to processes and power dimensions in conscious attempts to create a more or less level playing field. As Budds (2014) suggests, communities' abilities to engage and object not just require their improved access to information, but also improvements in their skills to critically analyse and understand this information, as well as with the capacity and the influence to use it and make it count. Another implication of our analysis is that creative ways need to be identified to give voice to the environment (the ecosystem) beyond the one singular voice of science, allowing it to speak in multiple ways (as articulated by the different parties involved). And a third important implication is that it becomes essential to find

innovative ways of accounting for water uses beyond mere economic or market benefits, challenging dominant approaches of dealing with water (Trottier and Brooks 2013) to include longer-term and often harder to measure values and functions.

Chapter 5. The institutional regulation of the sustainability of water resources within mining contexts: Accountability and plurality



Guided tour – Yanacocha's mining site, Cajamarca. Photo: M. Sosa.

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5.1 Introduction

Since 1990, mineral extraction frontiers have rapidly expanded in the developing world. Transnational companies have started exploiting mineral deposits in rural mountainous areas, like the Andes (Bebbington 2007, Bebbington 2013, ECLAC 2013) often through the development of large scale open pit mines, a form of mining known for “its high productivity and its low production costs” (Dammert and Molinelli 2007:60). Peru is one of the countries that have been particularly active in attracting mining investors, to become one of the major mining hotspots in the region (Bury 2002, Torres 2007, de Echave et al. 2009a).

This chapter explores the sustainability challenges that this mining boom creates in the regions where extraction occurs, discussing in particular the effectiveness of existing institutional arrangements for safeguarding the long-term integrity of water resources and water-based ecosystems. Rather than nurturing beliefs that mining operations can ever be sustainable, our exploration is informed by deep awareness that mining is intrinsically exploitative. Accepting that mining operations take place, the intention in the chapter is to seek for institutional ways or mechanisms to combine mineral extraction with the protection of water resources or water-based ecosystems. Mining operations alter not just the quantity and quality of water flows, but also entail an often irreversible transformation of existing institutional forms of regulating and governing water (Budds and Hinojosa 2012, Sosa and Zwarteveen 2012, Bebbington 2013). Focusing on the developments of the rapidly growing mining sector and their pioneer players in the Latin American context, we use the conceptual lens of legal pluralism (Benda-Beckmann et al. 1998, Roth et al. 2005, Boelens 2008) to show that those current forms for regulating water resources in mining areas risk being ineffective. Although mining companies are accountable to organizations outside of their area of operation, through compliance with several national and international agreements and codes of conduct, the people that directly witness and experience the impacts of mining operations have few formal options to share their knowledge or voice their concerns. In terms of legal pluralism, this problem stems from the fact that existing regulatory mechanisms rely too much on external sources of (scientific) expertise, authority and

norms, to the neglect of local and existing (or traditional) sources of knowledge and regulation (Bavinck and Gupta 2014)

The chapter is based on a literature review of water and mining, surface or open pit large scale operations. It presents this review against the exemplar, based on empirical findings, of the Yanacocha gold mine, located in Peru. Following the introduction, we present the institutional panorama for regulating water use within mining contexts. Then we engage with insights about regulating the impacts of mining on water resources and finally we present an assessment of the regulations of sustainable water within mining contexts. We conclude that to enhance the sustainability of water resources used by companies and by communities surrounding them, it is necessary to make companies accountable for their actions not only to international and national regulations, but also to those directly affected by mining operations.

5.2 Water and mines: Institutional pluralisation

Open pit gold mining requires large amounts of water (Budds 2010) to leach the gold-containing soil. In heap-leaching platforms, the soil is washed with water containing specific chemicals, such as cyanide, to separate out the mineral. Most developing countries actively welcome foreign investments in mining operations through a combination of favourable tax conditions and institutional and legal reforms that make it relatively easy for new companies to obtain land and water (Budds and Hinojosa 2012). In Peru, mining companies were given concessions that allowed them to make use of the land that was used by smallholder farmer communities. In line with stories on land (Borras Jr and Franco 2012) and water grabbing elsewhere, these communities only realized that their lands had been given out to concession when the investors arrived to the area to negotiate access to the land. Some of the communities that were happy at first to engage in land negotiations, later doubted the fairness of the compensation they had received (Deza 2008, Lingán 2008, Arana Zegarra 2009). Land negotiations sometimes happened under the threat of forcefully dispossessing communities of their lands (Pascó-Font et al. 2003).

In many instances, the acquisition of land served as an indirect way of also obtaining access to water, making it physically possible for mining companies to access and

control water sources. How this is legally justified varies per country. Chile for example introduced a Water Code which allowed the trading of water rights, making it possible for companies to purchase water rights (Budds 2010). Likewise in Peru, a new Water Resources Law 29338 was enacted¹⁰², and new state water authorities were created that were accountable to the newly created National Water Authority. The new law instituted a central water rights' registry, administrated by regional water authorities, thus making it possible to free and re-distribute 'unused' water rights. This is the way the pioneer large gold mining company Yanacocha legally obtained its water rights. When no such rights were available, the company went through great efforts to convince communities to give up their rights, offering them sums of money and other benefits in return, together with investments in communities' development. These deals were often agreed upon in long-winding extra-judicial agreements. In this sense, the company made use of both formal laws as well as of extra-legal or informal ways to get water rights.

Changes in the water law in combination with the active purchasing of land, and water rights by mining companies drastically alter the institutional regulation of water, often culminating in the concentration of rights and powers in the companies (Budds and Hinojosa 2012). Perreault, in an analysis of the impacts of mining on water in the Bolivian Altiplano, thus concludes that "mining activity has usurped much of the water and water rights formerly enjoyed by downstream indigenous *campesino* communities" (Perreault 2013: 1062). On paper, the newly created legal water situation appears neat, smooth and uniform. Yet, this chapter uniformity hides the fact that existing water user communities often continue to rely on and refer to traditional arrangements and institutions for accessing and managing water. These are anchored in their territories, knowledge, and belief systems that have evolved over generations of living in co-dependence with water-based ecosystems (Gelles 2000, Boelens 2008, Vera Delgado 2011).

¹⁰² According to Del Castillo, (in Budds and Hinojosa 2012), the modifications of the legal apparatus respond -among others- to the need to better accommodate the water use requirements and challenges of an emerging industrial sector e.g. extractive industries, agro-export, etc.

It is telling in this respect that in Cajamarca, Peru –one of the most popular regions for transnational mining investors-, many water users were not particularly interested in registering their historical uses of water so as to formally acquire legal rights to water. Farmers did not see any use or benefit in doing this, neither did they see the existing basin-level water user association as their representative or as a supportive organizations in case of water problems. Interviews with members of affected communities revealed that many based their sense of water ownership on prior histories of land, and water use and investment in infrastructure, rather than on formal registration. Yet, by not registering, their waters got marked as ‘unused’ and could be acquired by others. Although many communities thus lost their formal powers of access to mining companies in this way, communities often continued to consider themselves as the custodians of water territories: rather than ‘owning’ the water, they feel responsible for caring for the waters and lands that they depend upon. In return for this care, they feel entitled to use it. Water is thus conceived by the communities within a distinct legal field (Roth et al. , Boelens and Seemann 2014) which is based on an entirely different ontological conception of ‘rights’ than the one of the Water Resources Law 29338. This Law declares that water belongs to the state, with the licence to use it being regulated via water permits that are given by the respective water authority (República del Perú).

5.3 Regulating the water impacts of mining

As mining often happens in the headwater regions of river basins, the use and diversion of water by mining companies considerably affects downstream water flows. Studies analysing the impacts of extractive industries in Bolivia, Ecuador and Peru,¹⁰³ show how leaching operations entail both changes in water quality, polluting rivers with mining waste, as well as changes in water quantities, altering and reducing downstream water availabilities (Bury 2004, Younger et al. 2004, Bury 2005, Bebbington 2007, Bebbington and Bury 2009, Yacoub 2013). Because of the location of the Yanacocha mine on the catchment areas of four watersheds: Grande, Quebrada

¹⁰³ Research carried out by the Concertacion Programme, an interdisciplinary research and capacity building programme on local water management and water policies in the Andean Region. Programme coordinated by Wageningen University, The Netherlands.

Honda, Mashcón and Chonta (see Figure 10), there are reports providing testimonies or measurements of how Yanacocha's water uses have impacted the availability and quality of water for human consumption, irrigation and livestock production (Bury 2004, Yacoub 2013).

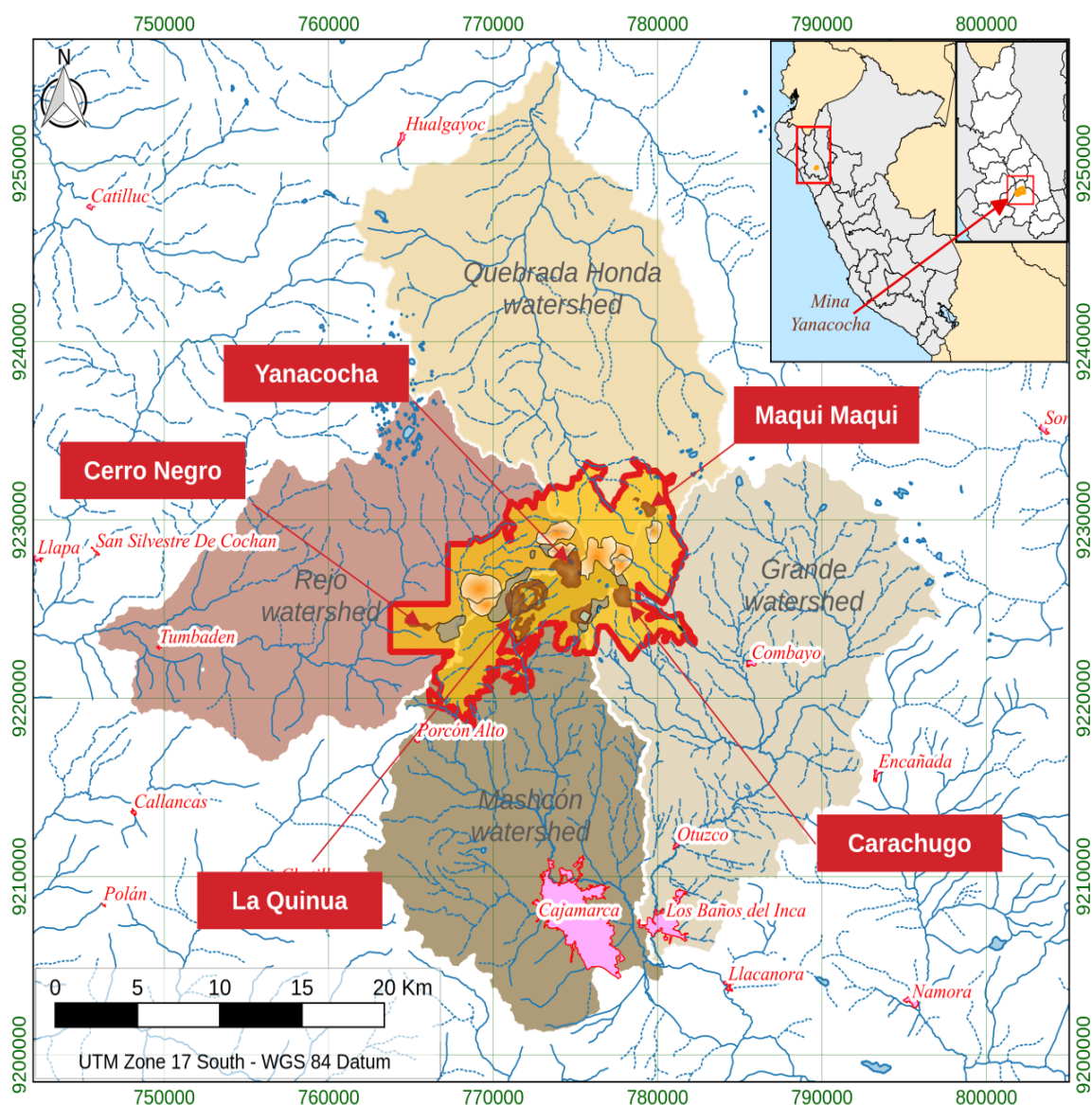


Figure 10. Mining operations of Yanacocha in main watersheds – Cajamarca. Modified from Yanacocha 2008 by C. Cerdán and the author

On the basis of the European Water Framework Directive, Yacoub assessed the water quality of Andean watersheds in Cajamarca, particularly in rivers that are in contact

with effluents from mining operations such as the Jequetepeque river in the vicinity of Yanacocha. This river was diagnosed as polluted because of the accumulation of heavy metals and sediments (Yacoub 2013). Also, because of the water diverted and used in heap-leaching platforms, the catchments areas of the Crisnejas, Rejo and Grande rivers have stopped functioning as water collecting areas (Preciado Jerónimo 2011). The dewatering or removal of water sources needed for the work in open pits, has also caused depletion of groundwater (Sosa and Zwarteveen 2011). The company itself reported (Yanacocha 2011) how it caused a reduction or even disappearance of surface water flows because its operations affected creeks that used to feed farmers' irrigation canals. Communities (or organizations representing them) likewise reported how their canals have run dry since the mine started operations (Arana Zegarra 2012). Hence, there is no question that open pit mining operations rely on, and drastically alter, existing water flows and water-based ecosystems. However, the precise measurement of these impacts is difficult and often itself the source of contestation and sometimes conflict.

Concerns about such impacts form the background to ever more sophisticated global regulations devised to make sure that mining operations do not provoke irreversible damage to longer-term water sustainability. These include the ILO 169 International Agreement (of which Peru is a signatory country), the Extractive Industries Transparency Initiative (EITI)¹⁰⁴ and the Global Reporting Initiative (GRI).¹⁰⁵ Companies working in countries that have signed these initiatives agree to report on their environmental performance, providing evidence of compliance with the regulations (Fonseca et al. 2013). In sustainability reports, mining companies meticulously document the various actions they undertake to comply with different social, environmental, labour and economic laws and mandates. Although often based on their internal company rules, these reports largely follow the international

¹⁰⁴ EITI consists on reporting and implementing standards with full disclosure of taxes and other payments made by companies to governments. It aims to improve openness and accountable management of revenues from extractive activities and better information sharing. <http://eiti.org/eiti> (Accessed 23.04.2014).

¹⁰⁵ GRI is the most used sustainability reporting framework within the mining sector (Fonseca et al. 2013)

standards and guidelines to which the companies have committed such as: Voluntary Principles on Security and Human Rights, GRI, International Cyanide Management Code, the ICMM 10 Principles of Sustainable Development from the International Council on Mining and Metals (ICMM), etc.

At national levels, Environmental Impact Assessments (EIAs) provide an important institutional mechanism for safeguarding the sustainability of mining operations. According to the International Association for Impact Assessment (IAIA) in (Li 2009: 219) “the EIA is a process of ‘identifying, predicting, evaluating and mitigating the biophysical, social, and other effects of development proposals” (also see Lawrence 2003: 7). Yanacocha diligently executes EIAs, using this to safeguard its reputation as a company. Its 2011 sustainability report documents that Yanacocha invested¹⁰⁶ almost 4 million of soles on water management issues and about 1.5 million of soles on social responsibility. Through these investments, the company supported the construction of drinking water systems, the implementation of sprinkler irrigation systems, the rehabilitation of irrigation canals and the construction of reservoirs benefiting more than 300 families (Yanacocha 2011, Yanacocha 2012). Such investments and actions constitute the concrete measures the company engaged in to assume its social and environmental responsibility (Yanacocha 2009). In addition, and just like most other mining companies in the region, see for example the case of Pierina gold mine (Himley 2010), Yanacocha also engaged in a number of additional activities aimed at making mining operations (seem) as beneficial as possible to society and nature, and more broadly, trying to picture companies as a drivers of development (Himley 2010). One such programme was the Voluntary Support Programme or Mining Programme of Solidarity with the Community, launched in Peru in 2007 by the government of Alan García.

The existence of international and national regulations is testimony of the seriousness with which sustainability is addressed at policy levels. Yet, many have raised concerns about their effectiveness (Gupta and Pahl-Wostl 2013). Some critics question the

¹⁰⁶ Amounts in Peruvian currency –Nuevos soles or soles - with an average exchange rate of US 2.7 dollars the investments are: US 1.447.041 million dollars and US 580972.1 dollars respectively.

usefulness of the information collected for environmental assessments, as much of it relies on technical data that measure direct particular impacts in specific localities rather than providing ecological analyses of life production cycles and system dynamics that would be needed for understanding how mining operations impact longer-term water-based ecosystems and biodiversity (Fonseca et al. 2013). The different projects companies engage in to address social and environmental concerns likewise are not aimed at regenerating or restoring damaged ecosystems or water flows, but instead merely mitigate identified impacts, sometimes in ways that may even cause further damage. On the basis of an analysis of mining reports from different companies, Mudd (2008) more specifically argues that the reports poorly address water sustainability issues. They often do not include the impacts on water use or the total amount of water needed for mineral production. In-depth studies examining the functioning of EIAs in practice likewise raise a number of important questions about their effectiveness. Li (2009) documents how an EIA¹⁰⁷ rather than a mechanism to hold the mining company accountable to the impacts of its operations on environmental and water sustainability, instead worked to further legitimize and prioritize resource extraction. As there is a lot of room for mining companies themselves to define what is and what is not considered in the EIA, there is considerable risk that they just include the issues they can address and find solutions for, to the neglect of others. Hence, also “people’s needs are defined by what the mining company can offer” (Li 2009:231).

The many protests and disagreements that surround mining operations are caused by concerns of a very similar nature. Yanacocha serves as a good illustration of how these conflicts play out. The Peruvian government considers Yanacocha as a 'model company' in terms of its environmental behaviour. In 2008, Yanacocha even received an environmental protection prize from the Peruvian government. This prize was a reward and public recognition for the company's efforts to construct a water reservoir in a former open pit, to provide water to communities whose canals had run dry because of the mining operations. Yet, there are many in and outside Peru who do not

¹⁰⁷ Research based on the Yanacocha West Supplementary Project -PSYO- for the expansion of the Yanacocha mining operations located in Cajamarca, Peru.

share this admiration for Yanacocha's environmental behaviour. During interviews with farmers and communities' advisors, it was stated that communities in Cajamarca were not at all happy with how the company dealt with their reduced access to water. The construction of the reservoir implied that instead of what they considered 'natural' water, they would now receive treated water. This water was much less appreciated: it tasted and smelled differently; made grass that is irrigated with it turn yellow and caused cattle drinking it to become ill. Although the treated water was not intended for human consumption, some *comuneros* did drink it and experienced stomach problems as a result. Communities also protested against the company's plans to mitigate its use of four lakes for another project of Yanacocha in Cajamarca: the Conga mining project. To compensate for the loss of these lakes, Yanacocha proposed the construction of four new reservoirs that would assure effective water storage for the area (Preciado Jerónimo 2012). Together with environmental NGOs, local communities led by the regional water authority questioned this solution, arguing that the destruction of the lakes would not only affect downstream water uses and users, but also irrevocably alter the water-based ecosystem in the region. Most of these and other protests did not significantly change the plans of the company. A notable exception is the Mount Quilish: here the energetic attempts of large sections of the urban and rural residents to protect their sacred mountain made the company change its plans (Preciado Jerónimo 2012).

Fed by larger and more fundamental controversies about whether mining can ever be sustainable (Amezaga et al. 2010, Mudd 2009), such disagreements happen within a broader institutional context that separates the governance of mineral expansion from that of water resources and local development, and that is characterised by large asymmetries of power favouring large scale investment over local livelihoods and environment (Bebbington and Bury 2009: 1, Himley 2010). They also reveal a fundamental flaw in the effectiveness of existing institutional forms of holding mining companies accountable to the impacts of their operations on the environment and water. We further explain this in the next section.

5.4 Accountability and institutional pluralism: The regulation of water sustainability in mining contexts

Existing forms of regulating and controlling the water impacts of mining companies rely, almost entirely, on what we call 'upward accountability': companies' social and environmental behaviour is assessed against general indicators, based on technical assessments, by parties that are far removed geographically from the areas where extraction occurs. As we have shown, the norms and rules that guide the environmental behaviour of mining companies are set by international and national standards and protocols, often informed by scientific and supposedly objective methods. This has a clear positive side: it makes it possible to compare the conduct of mining companies within and across countries, and provides them with a clear incentive to behave 'properly' as not doing so would damage their reputation. Yet, being upwardly accountable and complying with national and international regulations creates an undesirable separation between *authorized assessments* of the effects the mining operations and how these effects are experienced. This separation is the root cause of the many controversies, disputes and conflicts that mining operations provoke. According to the *Defensoría del Pueblo* (Peruvian Ombudsman) from 221 social conflicts nationwide reported during the last months of 2013, 143 were about socio environmental cases with 48.4% related to mining activities (Defensoria del Pueblo 2013). According to the same report, Cajamarca, where Yanacocha is located, is among the five most conflicting regions in the country. These conflicts are directly "linked to the mining-sustainability relationship and are motivated by concerns about livelihood security, environmental degradation and by the perception that wellbeing has not increased in proportion to the profits of mining companies" (Bebbington and Bury 2009: 17296).

That a mining company can comply with all environmental regulations (and even receive national awards for its environmental behaviour), while at the same time provoking many disagreements, protests and conflicts is indicative of weaknesses in the current institutional regulation of sustainability. Next to well documented problems of reporting and enforcement (Li 2009), these have to do with a lack of downward accountability: the existing norms and standards (or the procedures for

enforcing them) lack legitimacy in the eyes of many, most notably of those who directly experience the impacts of mining operations. Members of local communities, even when they have transferred their land- and water rights to the mining company, continue to consider themselves if not the owners than certainly the custodians of their territories, including the water sources located on those. Their intimate knowledge of the water sources and flows, and the fact that their livelihoods depend on these, turn them into articulate spokespersons for the ecological integrity of their living environments.

Yet the formal institutional regulation of sustainability gives very few formal possibilities to local communities and their representatives to voice their concerns, share their knowledge, or influence courses of action. Existing EIA procedures do include public hearings, allowing community members to voice their concerns and articulate their opinions. Yet, these public hearings seldom prevent an EIA from getting approved, but instead tend to be used by companies to obtain public and formal endorsement of the EIA process, and to limit and disqualify oppositional voices (Li 2009: 220). As Partidario and Sheate (2013) suggest, Impact Assessment (IA) processes are based on a restricted number of consultations that may just be organized to formally comply with legal requirements. Sometimes community members can also participate in regional policy planning processes (in Peru this is the Ecological and Economic Zoning process), or make use of the Ombudsman Office to influence the environmental conduct of mining companies. However, to what extent communities have the courage to actually make use of such possibilities, or to engage in more informal ways to question mining companies, strongly depends on how much they stand to lose. In the case of Yanacocha, the company has gone through a lot of effort, and spent much money, on various development projects. For instance, it supported the construction of the community meeting room and the implementation of stoves in every household. Importantly, the company or its sub-contractors also often hire community members to work on those development projects. Several local people even initiated community companies, as a way to get included in the list of local contractors that provide services to Yanacocha. Many *comuneros* thus directly depend for their livelihoods on the mining company, a dependence that may make them

reluctant to formally or informally question its environmental conduct, even when they are deeply concerned about it. In addition, and as we showed, in the process of installing itself and starting operations, mining companies often effectively accumulate many land- and water rights, thereby also accumulating powers to decide what happens with land and water. This power further increases when companies, like Yanacocha did, themselves invest in water treatment plants or new conveyance infrastructure which they also operate. Through such investments, mining companies not just legally but also physically control water.

Further complicating effective downward relations of accountability is the fact that much of the knowledge of communities is based on experiential data. This knowledge is therefore not accepted as authoritative or considered legitimate enough to inform policy or enforce regulation. The more technical and scientifically endorsed information produced by formal procedures (Li 2009) is often challenged by local residents (Horowitz 2010). In fact, differences between indicators used by local residents which are often considered as “vernacular and based on everyday monitoring of the landscape” (Bebbington and Bury: 3) and those used by mining representatives which are based on quantitative technical assessments and structured monitoring programmes, frequently lie at the basis of conflicting views about changes in water quality and quantity. Such differences often also inform local protest, as affected communities have few other means to voice their concerns and dissatisfaction. We would agree with Partidario and Sheate (2013) who suggest that it may be essential to “to receive, accept and make use of other forms of knowledge and values” from different stakeholders. This is important also because (access to and production of) scientific information is itself often concentrated in those with most political power, including the mining company, leading to a situation in which only the company is perceived to have the right credentials and measuring devices to collect the information used to assess its own environmental behaviour.

5.5 Conclusions

The regulation of the sustainability of water resources in mining areas can be characterised as institutionally plural, with fundamental differences and

disagreements about definitions, principles, procedures and the essence of law (Bavinck and Gupta 2014). Our analysis shows that institutional mechanisms to hold mining companies accountable are mainly directed 'upward' - meeting national and international standards through reports compiled by companies themselves - rather than 'downward' - based on the knowledge of those who directly experience the effects of mining operations on their everyday lives. National and international regulations to monitor and control the impacts of mining operations on the quality and quantity of water flows do not prevent mining companies from irretrievably damaging water-based ecosystems, thereby endangering both biodiversity and the livelihoods of local communities. An important institutional reason for this is that these regulations and procedures separate assessments of changes in water resources from communities' experiences of degradation, experiences that are informed by the intimate knowledge communities have gained through generations of living in the area. They often continue considering themselves as the rightful custodians of their territories and waters, even when they have formally lost their rights. Existing institutional frameworks discredit traditional legal and normative orders and knowledge systems, making it near to impossible for members of affected communities to legitimately articulate concerns, share their knowledge or question the behaviour of mining companies. In line with findings from sustainability science and governance studies the chapter concludes that mechanisms for regulating the sustainability of water resources in mining contexts will only be effective when accompanied with the sharing of knowledge (information) and power, needed to forge downward accountability relations (Partidario and Sheate 2013: 27). This requires finding creative ways of endorsing the knowledge and customary rights of local communities, to foster processes of 'good enough governance' and 'institutional bricolage' (Bavinck and Gupta 2014) that are based on the acknowledgment and acceptance of the plurality of institutions and knowledges that co-constitute water resources in mining contexts.

Chapter 6. Conclusions and reflections



Trueque in Challhuahuacho, Apurímac. Photo: M. Sosa.

6.1 Introduction

This chapter presents the major findings of the research, organized and articulated to respond to the main question that was elaborated in the introduction: *How does water governance evolve in contexts of large mining operations in the Peruvian Andes?* This is linked to a more theoretical discussion about water governance, focusing on how the conceptualization of water governance in terms of process and relations yields useful and very different insights as compared to conceptualizations that see water governance as systems. As this research was conducted in particularly contentious and uneven waterscapes, its findings clearly illuminate how power hierarchies shape governance processes, often blocking the achievement of goals of sustainability and equity.

6.2 Major findings and research question

This thesis, based on the grounded qualitative unraveling of conflicts over water in mining contexts, has set out to conceptually and empirically explore the influence of large mining operations on water governance norms and arrangements in two Andean regions in Peru. It has brought together information about specific incidences of conflicts over water between mining companies and communities gathered through ethnographic fieldwork methods and the analysis of reports and (legal) documents, discussing this information against a range of theoretical ideas to explain the politics of accessing, using, managing and controlling water in contexts of extractive operations.

First: Mining formalizes local water governance arrangements

The main findings presented in chapter 2, around the activities of the mining project and operations of the Las Bambas mine in Apurímac, show that even before the actual operational phase of the mining endeavour, local water governance arrangements become restructured. This happens most forcefully through the formalization of local water rights, something that produces complexities and contradictions. The chapter shows how some rural communities approach and understand the formalization of rights as a legal-instrumental opportunity to improve (or sometimes even newly obtain) water security. They hope and expect that the formalization of their water

rights systems will protect their water uses from the actual or potential demands and threats by the mines, other communities and third parties. Similarly, some communities use 'formalization' as a strategic, empowering mechanism to enhance their negotiation position about the access and use of the water sources that are located in their territories. This strategy was evident in those communities that engaged in negotiations over land titles and territorial access rights with the mining company. The possibility to use (rights to) resources as a resource in negotiations with powerful others is quite tempting for certain communities, particularly when they are located in socially marginalized and economically poor zones and do not have many other sources of bargaining power. Yet, the fact that some communities use natural resources to make (business) deals has profound implications for those existing (vernacular) water control arrangements that did not depend on economic or monetary transactions, but on ideas that link the distribution and sharing of water to family and community labor contributions (see below). There are also communities that choose not to resort to formalization because it is a very costly and cumbersome process, one that is impossible to afford without some source of extra income or help from the mining company. Ironically, it is often the mining company that constitutes the source (and promoter) of the funding and technical advice needed to materialize the formalization process.

The chapter's findings thus illustrate the tensions that are generated because one community (Fuerabamba) was assigned formal water rights. This was a community that had to be relocated by the mining company to allow for open pit operations on the community's land. Fuerabamba got the support of the company to formalize its water rights, rights that supersedes existing local ways to deal with water in and among the communities. Through the formalization process, Fuerabamba's rights got prioritized over those of other communities. Voluntary, age-old agreements concerning the sharing of water flows and springs among communities, based on their own experiential assessments and historically anchored in wider relations of sharing and mutual help, were replaced by a nation-wide formal system in which rights can be compared and transferred across places and thus becomes dis-embedded from local history, place, and cultural dynamics.

The chapter thus highlights that the formalization propelled by mining imposes a new normative hierarchy that privileges the rights of those aligned with the mining company over those that oppose it. This not just disrupts relatively well-functioning and sustainable ways of dealing with, sharing and caring for water. It also exacerbates old inequalities and creates new ones, when, in a context of competing claims, some enjoy the support of a mining company and the formal legal system and not others. My research findings of the Apurímac case thus lead me to make a plea for critically analyzing the impacts of water policies that mechanically advocate for 'water rights formalization' as a way to improve poor communities' water security. Formalization always happens as part of the dynamic power-laden interactions between communities and between communities and mining companies. It is part of wider struggles over access to and control over water and land that characterize these interactions.

Second: The mines control water in areas where they operate

Large-scale mining operations entail major shifts in how water is used, owned and managed in the Peruvian Andes. Mining needs relatively large quantities of water in mostly arid or semi-arid zones. For accessing these water sources and flows, mining companies display a range of strategies. With a particular focus on the large mining operations of the Yanacocha gold mine, Chapter 3 shows that these strategies are not clear-cut, but entail long-winding, fuzzy and opaque processes of negotiation between communities and mines taking place in a highly unequal playing field. It is also a process in which all parties gradually develop more political astuteness: they learn which bargaining strategies are most effective, and become ever more smart in negotiating compromises. I show how water and rights figure prominently in negotiations about the compensation for mining impacts, with the mining company indirectly offering money or other kinds of benefits in return for communities' water rights. Another strategy of the mining company to obtain water was to systematically deny existing rights. By damaging and blocking a canal constructed by farmers, the mining company could assert that it was in disuse, eventually even denying its existence altogether. In addition to thus intervening in the allocation of water rights to

obtain control over water, mining operations also more directly altered water flows through dewatering processes in the catchment areas, causing farmers downstream of the mine to lose their water sources. Because the mining company offered to provide them with treated water instead, the company de facto took over the authority of managing the upstream water sources. The net effect of all these strategies and actions combined is a thorough reconfiguration of water governance in the area: an irreversible transfer of water control powers from communities or state agencies to the wealthy transnational mining company. This de facto take-over raises serious concerns about questions of sustainability and equity, linked to the difficulty to hold the mining company accountable for the social and environmental impacts of its actions.

Third: 'Objective' solutions do not help to deal with conflicts but legitimize the mining company's water use

To deal with the conflicts surrounding mining activities in the Peruvian highlands, state agents and the mining company Yanacocha make use of a number of strategies, including violence and informal bribes. The more formal strategies that mining companies deploy to deal with their contentious water-interventions are based on and make use of the objective and neutral image of law and science (or technology). First, by making sure that everything the company proposed to do was legally right by obtaining all required permissions, the company could dismiss many complaints by simply stating that it operates within the law. Second, the Yanacocha mining company made sure that what it did was backed up by scientific arguments and approval. It did this by commissioning scientifically approved impact assessments, as well as by proposing technologically advanced strategies to mitigate the impacts of mining on the environment, particularly on water. For instance, when – as was the case in Cajamarca – the process of mining risked draining and drying out entire lakes, Yanacocha proposed to compensate or replace the depleted water sources. One way of doing this was by building sophisticated treatment plants, which allowed cleaning and re-cycling the water it had used in its operations, water that could then be released to communities suffering from the depletion. These two strategies – based on law and science (and the use of sophisticated technology) – help give legitimacy to the

company's operations by associating it both with moral rightness and truth or modernity. Indeed, the discussed examples of chapter 4 show that legal compliance (formal justice) and technical (or scientific) accuracy function to legitimize mining operations, while the company's use of sophisticated water treatment technologies also provides it with an aura of modern optimism.

Law and technology (science) are thus strategically used as 'objective' and 'neutral' solutions to dilute and resolve tensions. Yet, the chapter, and the entire thesis, has shown that these solutions are and can never be objective and neutral: any legal measure or scientific assessment is always coloured by prior assumptions about what is right and what is true. The fact that the mining company has much better access to these solutions produces a situation in which legality, scientific truth and technological superiority become the exclusive privilege of the mining company. The effect is that arguments brought forward by communities against mining operations, including those based on their knowledges and experiences, are quickly and easily dismissed as non-legal and non-rational.

The chapter concludes that rather than correcting unsustainable or unjust behaviours, there is a real danger that these supposedly neutral or objective solutions work and are deployed as legitimizing devices for those in power, allowing them to continue with their work. In that regard, this thesis urges to understand that the complex and deeply political nature of mining conflicts makes it difficult or perhaps even impossible to institutionally or scientifically safeguard objectivity and neutrality. Instead of relying on forms of 'objectification' (law, science, technical solutions) that deny the intrinsically political nature of conflicts, water conflict resolution strategies need to recognize power differences and openly deal with them. Supporting communities (financially, technically and scientifically) to develop and mobilize their own legal and scientific contra-expertise could be one an important and meaningful step.

Fourth: Downward accountability is needed in contexts of extraction

This thesis shows that the institutional mechanisms to hold mining companies accountable are mainly directed upward: companies need to meet national and international standards through reports that they themselves have compiled. The effect of this is that it is relatively easy for companies to make it seem as if their behaviours are within set limitations: it is not very difficult to do the required measurements and assessments in such a way that outcomes look reasonable. This creates the faulty impression that the impacts of their mining operations are minimal or reparable. The irretrievable damage of extractive operations on water-based ecosystems, endangering both biodiversity and rural communities' livelihoods, thereby risk going unaccounted for.

The chapter in particular draws attention to how existing institutional frameworks discredit or dismiss locally prevailing customary legal frames and knowledge systems, making it near to impossible for members of affected communities to legitimately articulate concerns, share their knowledge or question the behaviour of mining companies. Against this scenario, this thesis proposes that, for effectively and meaningfully regulating the sustainability of water resources and protecting water-based ecosystems and livelihoods in mining contexts, upward forms of accountability need to be complemented by downward forms of accountability. The latter require ways to recognize, acknowledge and appreciate the intimate knowledge and experiences of those who are directly affected by mining operations in their everyday lives.

6.3 Theoretical discussion: Contributions to water governance debates

As elaborated in the section 1.3 of the introduction, this thesis engages with scholarly work documenting and discussing the implications of an aggressively expanding mining industry on local livelihoods and the environment, focusing especially on water. What lessons about water governance does the thesis generate?

Aligning with approaches to water governance as deeply political, based on the acknowledgment that water is an always contested resource, the thesis distances itself

from more normative approaches to governance. In these approaches, the term ‘good governance’ – associated with the promotion of transparency, accountability and integrity – has become the seemingly neutral title for a distinct political reform agenda (Colebatch 2014: 308). This agenda marries ‘New Public Management’ to the advocacy of liberal democracy (Rhodes 1996: 656) through the encouragement of competition and markets; the privatization of public enterprises; reforms of the civil service by reducing alleged over-staffing; the decentralization of administration and the greater reliance on non-governmental organisations. One notorious operationalization of this reform agenda consists of the creation of markets for water or water rights, something that is expected to both improve the productivity of water uses and address concerns about environmental degradation (Bakker 2007). This particular political-ideological use of the term water governance that has most fiercely marked discussions and debates, as the reliance on markets or quasi-market mechanisms for regulating resources is deeply contested on many accounts (Boelens and Zwarteveen 2005, Ahlers and Zwarteveen 2009, Arsel and Büscher 2012, Büscher 2015).

Indeed, in water the term governance is mostly used to normatively prescribe or help design particular institutional, organizational and financial arrangements for making water decisions and regulating water (Castro 2007, 2008, Meissner 2014, Zwarteveen 2015, Woodhouse and Muller 2017). The thesis instead has attempted to make sense of and help understand actual processes of governing water. I have posited in the introduction that this requires, first of all, to make the question of what governance means for whom itself the object of critical investigation: how and by whom is the term water governance used, and for what political or analytical goals? To do this, Colebatch’ observation that some people have an interest in referring to (often simple and straightforward) definitions of governance to denote or indeed justify what they do (Colebatch 2014) is useful. The mobilisation of particular accounts of governing is thus itself part of the practice of governing, with that what constitutes a ‘good account’ depending on context (Colebatch 2014: 312).

A second element of my analytical approach to describe and analyse water governance in mining contexts thus consists of acknowledging the many recursive linkages

between *knowing* water governance and *governing* water by accepting that any account of water governance is always deeply concept-dependent. The terms, categories and measurements used to describe and assess water governance are themselves, at least partially, informed by particular views of which form of governing (or governance structure) – be it the government, the market or networks – is best.

A third element of my approach to the analysis of water governance is the focus on the detailed documentation of everyday dealings with water, anchoring reflections about water governance in everyday water practices. How do farmers, water operators, mining company employees, government officials, researchers, educators and others engage, deal and live with water in their daily routines and interventions?

The thesis thus is an attempt to bring empirical depth to discussion on water governance through offering detailed accounts of governance practices, struggles and the interactive dealings and navigation strategies of communities and mines. By analysing several cases of interactions and conflicts between communities, mines and state water authorities in Apurímac and Cajamarca, this thesis adds to the debate of how politics are always inherent to and embedded in water control (e.g., Budds 2010, Perreault 2013, 2014a, Yacoub et al. 2015). These politics are often messy, consisting of long-winded processes of bargaining and negotiation in which all actors gradually get to know each other. Water governance in contentious contexts such as those of mining operations is necessarily a process full with contradictions, uncertainties and conflicts among actors –who have different political powers and interests in how water is to be governed and distributed (e.g., Roth et al. 2005, Swyngedouw 2005, Bridge and Perreault 2009, Zwarteveen and Boelens 2014, Perreault 2014b, Boelens 2015, Rasmussen 2015).

Compiling the cases, and aligning with studies that look at the challenges, opportunities and threats for sustainably governing water when mining happens (Bebbington and Bury 2009), a main and overarching conclusion of the thesis is that in mineral extraction contexts, the preservation of water and ecosystems requires strong institutions to endorse the experiences, rights and knowledge of those affected by operations. Active support to the development of expertise to contest and challenge

the expertise mobilized by mining companies, as well as the development of mechanisms for downward forms accountability that go beyond cosmetic hearings and forms of participation (Sosa and Zwarteveen 2014) are needed here – in addition to other measures and actions directed at somehow creating a more even playing field, empowering and supporting communities to continue to protect what they care for without risking to be accused of criminal behaviour and without being lured into silence by huge sums of mining money.

By showing the diverse gamut of practices and strategies deployed by different actors when seeking to access and control water, and when dealing with mining conflicts, this thesis also sheds light on the *realpolitik* nature of water governance in mining contexts. I have shown that actual water decisions and agreements often come about on the basis of often short-term practical or pragmatic considerations, rather than being based on moral or ideological principles. This is why a dichotomous co-option-accommodation versus resistance-revolt type of analysis of the interactions between mining companies and communities fails to shed light on the sometimes rather banal motivations of those engaging in them. Without denying the deeply unequal power relations that mark the interactions, nor the larger structural forces of capitalist development that they form part of, the thesis thus shows the importance of linking more structural analyses to an understanding of everyday strategies, governance processes, and livelihoods and water control arrangements.

In sum, this thesis highlights the value of analyses that go beyond what prescriptive or formal frameworks mandate about using and distributing water. In its attempt to recognize how water governance is always political, the thesis has among other things shown that relying on or adhering to technical and legal frameworks makes deeply political questions disappear – a process that Li has famously called “rendering technical” (Li 2007). Thus, this thesis highlights that for interventions in mining conflict situations to be meaningful, they need to openly recognize and deal with the inherent and embedded political nature of conflicts (Sosa and Zwarteveen 2016).

The thesis also makes a plea to go beyond the mere exposure of the politics and power behind or hidden in formal laws, technologies or science. Zooming in and engaging

with the messy everyday practices of accessing, using, managing and struggling for water at extraction sites, the thesis argues for taking individual and collective experiences, histories and meanings seriously in accounts of water governance. Here, it becomes important to acknowledge that outcomes of water governance practices, decisions and arrangements are not always easy to predict (Sosa et al. 2017).

This thesis also adds to and usefully complements an emerging water grabbing debates (Franco et al. 2013, de Bont et al. 2016) by showing how beyond the direct appropriation of water, water grabbing may also happen in more indirect ways as a collateral by-effect of extractive industries that are not interested in the water per se, but just need it for their operations. Here, I show how the construction of advanced hydraulic infrastructure and treatments plants by mining companies serves as a legitimizer of the use of water by mining companies, who emphasize their financial investments in such technologies as evidence of their active contributions to environmental conservation. This is disingenuous, and I also show how these technologies dangerously work to shift the *de facto* powers of appropriating and controlling water to the company (Sosa and Zwarteveen 2012).

6.4 Implications for governance practices

Water governance in mining impacted regions in the Peruvian Andes faces huge sustainability challenges. These tend to get glossed over in official accounts, as extractive practices receive full support by the central government. The latter gives concessions without serious consideration for local natural resources strategies and rural livelihoods development (Bebbington and Bury 2010), as the national economy has become so dependent on the incomes of mining. Mining and other extractivist interventions usually take place in remote rural areas where formalized state rules have low legitimacy, application, or even seem to be absent. While this may make it relatively easy for mining companies to negotiate land- and water rights, it is important to realize that mining operations never happen in “legally and institutionally empty spaces”. Even in the absence of formal rights, mining operations happen in societal contexts characterized by existing governance arrangements,

natural resources management histories, vernacular water control institutions, farmer and indigenous knowledges, and local livelihood and community dynamics.

Acknowledging the existence of current governance arrangements and the wisdom that they embody entails a fundamental re-consideration of existing procedures and institutions. This research stresses the need to understand and consider the already existing local water rights arrangements among rural communities, which determine the actual practices of water usage and governance at intra- and inter-communal levels (see e.g. Boelens 2015, Hoogesteger and Verzijl 2015, Rasmussen 2015). As Bebbington and Bury (2010) conclude, far from imposing mining, planning this activity requires careful consultation and interactive planning processes; collectively and publicly defining areas that could be considered appropriate for extraction, to better align mining to existing rural livelihoods and their vernacular modes of water governance and usage. This way also, by considering locally grounded questions and particularities of rural community environments and livelihoods, the extractive-mining industry may be held accountable for its actions and impacts (cf. Sosa and Zwartveen 2014).

An important implication of my research for policy makers and practitioners thus refers to the need of fostering democratic governance processes. This requires openly acknowledging and addressing power differences in conscious attempts to create a more horizontal interaction where different water views interact with one another. Looking for example at how decisions for water allocation are made in contexts of competing claims, how decisions affect users, and in turn, how users can influence such allocations. Thus, materializing practices and strategies of social and environmental justice (e.g. Schlosberg 2004) asks for building countervailing forms of power and deliberation; multiscale interactions and platform collaborations that engage in resisting pervasive forms of accumulation of water and its control in the hands of the few, at the expenses of many (e.g., Bebbington et al. 2010, Hoogesteger 2013, Hoogesteger and Urteaga 2013).

6.5 Reflection: Re-thinking water governance in community -- mine relations

In this thesis I have shown the disputes and tensions between mines and communities, fighting for water (Chapter 2, 3, 4), for respect and for recognition (particularly in Chapter 3 and 4), but also struggling to get labour and material compensations through meaningful negotiations. As I observed in the introduction, this thesis navigates between disputes, resistance, opposition and negotiations for water and jobs, among other benefits. Grasping the intricacies between communities and mines in Andean extraction contexts, and the political complexities in permanently changing scenarios, asks for a subtle and refined focus. As I have observed above I suggest that, to understand how communities living next to large mining operations manoeuvre to continue with their lives and livelihoods, we should depart from black/white “resistance versus cooperation” arguments.

To this respect, my research aligns with Bebbington and Bury (2013), Hogenboom (2015), and Li (2015), who warn against considering stakeholders as fixed categories. Instead, they are to be understood as undergoing and reflecting ambiguous relationships, different interests, views and purposes; their actions result from blurred scenarios whereby actors interact, negotiate and collaborate in unexpected ways. Coinciding with open conflicts and struggles, I found communities and mines gathering and bargaining around land and water rights, engaging in compensations, and working together in benefit sharing projects like sprinkler irrigation introduction. Every interaction interrelates with the other, sometimes overlapping each other, which results in different types of relations that range from forging community-mine alliances when convenient for both parties or opposing the mine when disagreements prevail. Most theoretical frameworks that try to reason only from resistance versus accommodation perspectives are ill equipped to grasp the fluidity and complexity of minescape realities. Essentializing these positions and relations tends to bring disappointment and frustration to those who support or promote one particular community attitude or identity towards mining.

Community – mine relationships evolve and change over time, depending on contingencies. Resistance and cooperation with mining companies, including multiple

shades and colours of negotiation, tend to coexist in one community and may alternate frequently. I engaged with farmers and their stories and, while being empathetic with them more than with the mines, instead of romanticizing their actions or struggles, I started to realize that their decisions and strategies have multiple layers and motivations that entwine in complex, non-congruent ways.

Framings that portray communities' wishes as "*People do not want water, they want money*" are too simplistic to understand conflicts within mining scenarios. Many are the possible consequences for communities when they engage in relations of protest, negotiation or collaboration with the mining company; these involve diverse and often difficult choices. Communities engaging in negotiations risk to be considered, by companies or the state, as only interested in benefits from the mines, dismissing their concerns regarding environments or rural livelihoods. At the same time, these communities risk being considered, by their own peers, as selling out, losing credibility, trust and any future support in case of unexpected consequences.

6.6 Final remark

Considering the evidences and analysis presented in this thesis, a fundamental water governance question that this thesis has brought to the surface is the question of the longer-term sustainability of water resources. In governance terms, this is a question of scientific and political representation: what is the truth about water, and who has the authority or legitimacy to speak that truth?

I have shown that the triangular image of main actors -- communities, state and mines (Revesz and Diez 2006) -- cannot fully respond to the challenge of securing or protecting water and equitably sharing it. By law, the state assumes the responsibility of managing and caring for water, yet as this research has shown, in practice it is not able of doing this. Here, its dual role is particularly problematic: on one hand, the state acts as a regulator of natural resources use such as water, and on the other it acts as an active promotor of extractive industries. These two roles are often contradicting each other, with the enormous short-term economic benefits of mining often taking precedence over the less obvious longer term value of healthy rivers and water sources. The capacity of the state to effectively regulate water in Peru is further

compromised by the scattered and bureaucratic, centralistic functioning of its water authorities which, in addition to the *in situ* limitations of state agents who must adhere to technical-legal frameworks, prevents them from effectively dealing with water disputes. In the case of the mining companies, despite particular efforts to shift operations towards cleaner and more sustainable production or better community relations (Elizalde et al. 2009, Kemp 2010), the inherent, permanent need to extract water makes it difficult if not impossible to protect the water security of existing water users. Just like objectives of sustainability, objectives of fairness and justice thus become *de facto* sacrificed in favour of profits and so-called development. I do not join those who rely on rural communities as the only ones to turn to for helping safeguard and protect water resources, based on their inherent closeness to nature. The thesis shows that it is naïve to charge them with this task, as they – at least in the current set-up – not just lack the financial resources, but also the legal and political powers, as well as the (access to) science and technology. They, in sum, can never by themselves challenge the enormous powers of mining companies-state alliances in their greed for profits. In addition, placing communities in the role of the saviours of water leaves little (analytical and political) room for community members to articulate and develop their own livelihood projects.

Accepting that water mediates relations and it is in turn also shaped by relations, the thesis has shown that the way water is governed also determines how people relate to one another and vice-versa. In contexts of extraction, strategies to somehow re-negotiate and challenge the extreme historical political and economic power differences are needed. These necessarily rely on networks and alliances that supersede local contexts - including NGOs, federations, *Defensorías del Pueblo* and other actors. Without romanticizing communities, neither easily giving away waters nor adhering with mines, these networks will pursue multiple agendas that have in common the active re-politicization of extraction – continuously and actively questioning the kind of development it forms part of and helps promote. These networks need to contribute to creating mechanisms to re-organize power and decision making, helping make these meaningful to the ones that face the consequences of extraction.

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Appendix 1. List of Interviews and key informants

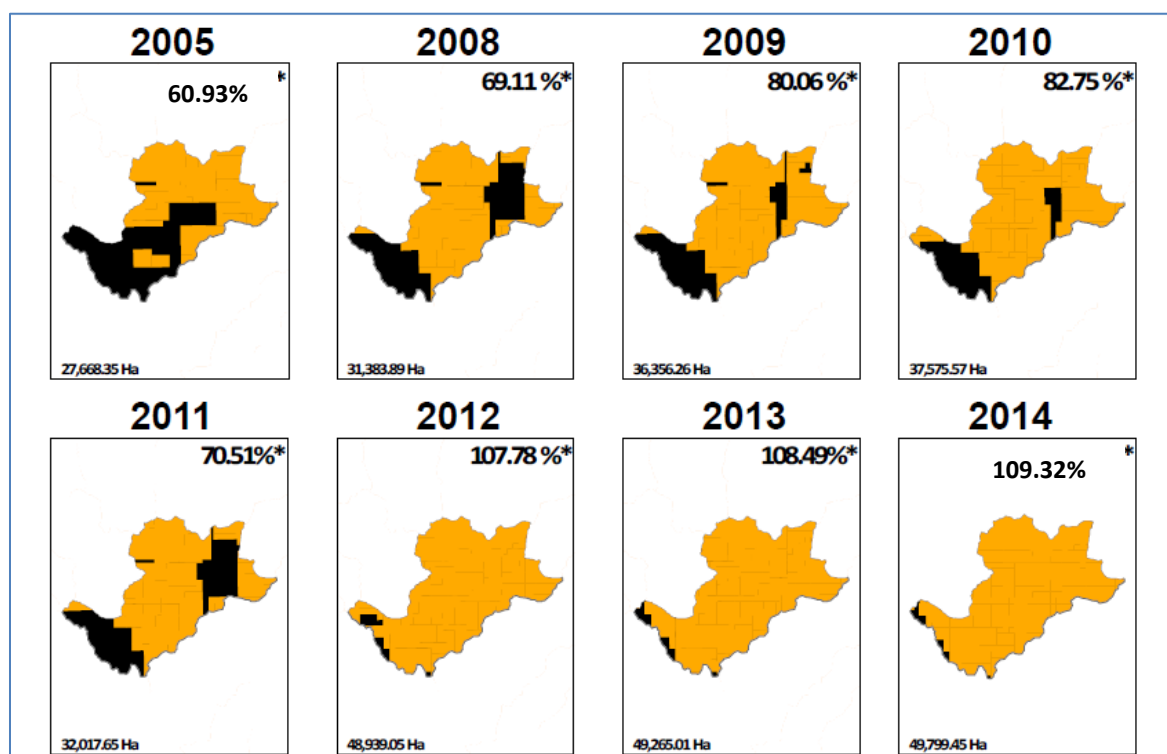
Number of interviews per category

Category	Number
Farmers and communities' leaders	50
Local, regional and national state representatives	37
Mining companies representatives	13
NGOs, consultants and local researchers	26
TOTAL	126

Key informants

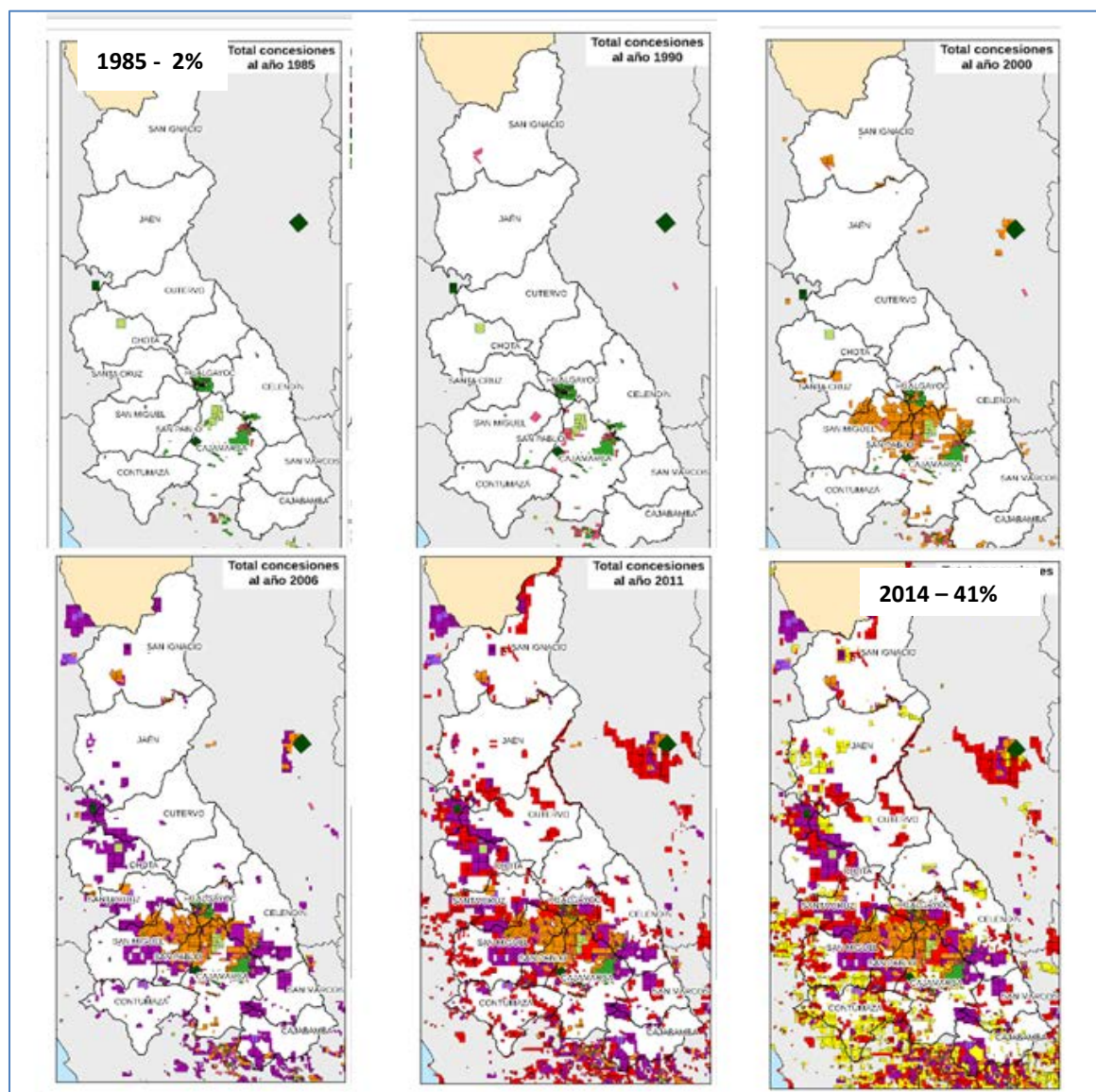
	Informants	Date	Location
1	Representative Ombudsman Office	2009-2015	Cajamarca
2	Representative Regional Government	2009-2010	Cajamarca
3	Representative ALA Cusco	2010-2012	Cusco
4	Former leader Combayo	2009-2010	Combayo-Cajamarca
5	Leader farmer irrigation canal	2009-2011	Combayo-Cajamarca
6	Local authority	2009-2010	Combayo-Cajamarca
7	Leader farmer irrigation canal	2009-2010	La Ramada-Cajamarca
8	Farmer leader	2010	Fuerabamba-Apurímac
9	Representative of local environmental NGO	2009-2015	Cajamarca
10	Representative Yanacocha mining company	2009-2010	Cajamarca
11	Employee Las Bambas mining company	2010	Apurímac-Cusco
12	Leader farmer irrigation canal	2010	La Ramada-Cajamarca
13	Representative of local NGO	2009 - 2015	Cajamarca
14	Former local NGO employee	2010-2015	Apurímac-Cusco
15	Community advisor	2011-2016	Cajamarca-Lima

Appendix 2. Mining concessions in Challhuahuacho – Apurímac



Note: From 60.93% of the territory of Challhuahuacho given for mining concessions in 2005, to 109.32% in 2014. Source: www.cooperaccion.com.pe (accessed Sept. 2014).

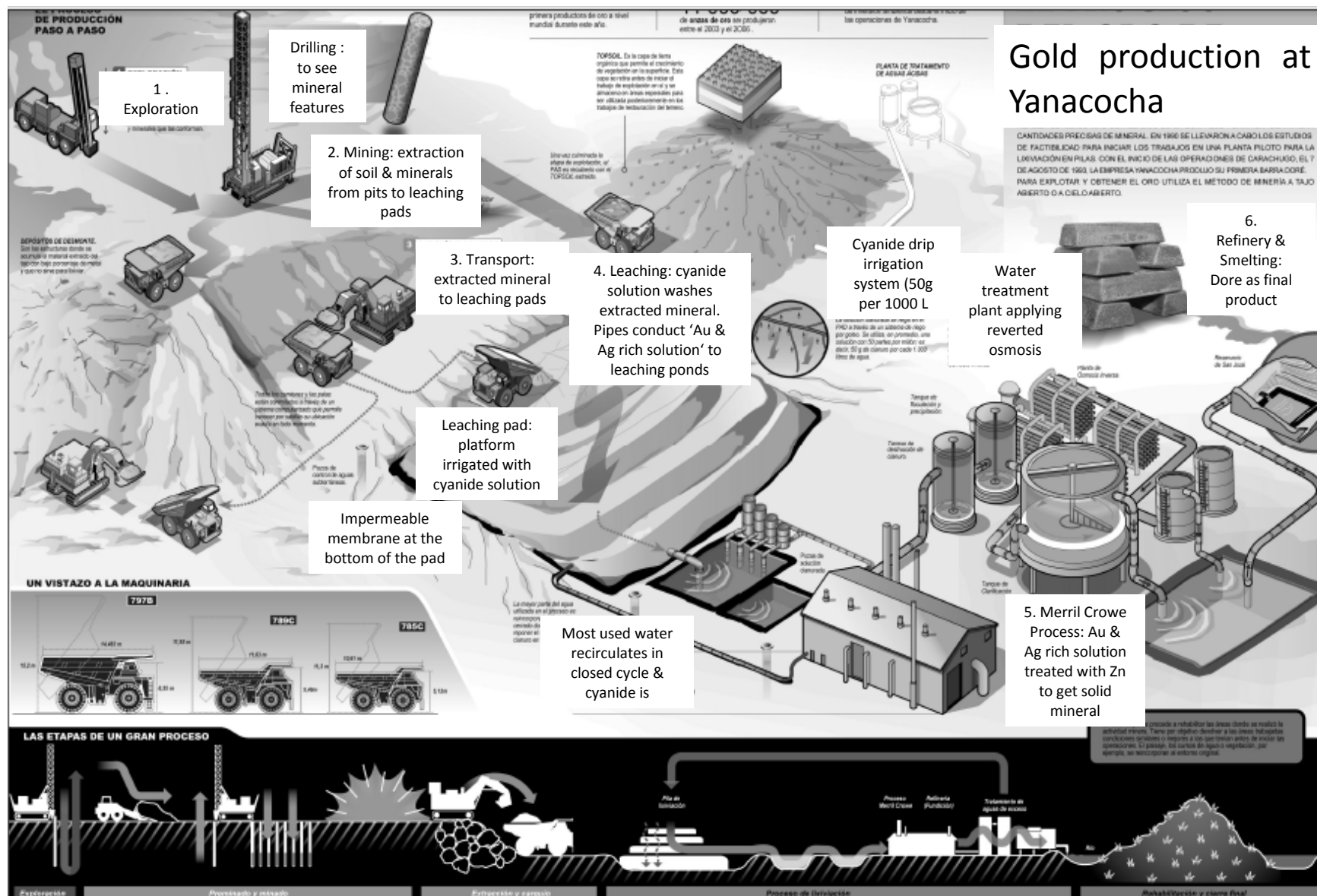
Appendix 3. Mining concessions in Cajamarca



Note: From 2% of the territory of Cajamarca given for mining concessions in 1985, to 41% in 2014 (Cerdán 2014)

Appendix 4. Gold production in Yanacocha mining company - Cajamarca

Gold production at Yanacocha



Appendix 5. Research fieldwork guide: Water notions in Las Bambas – Apurímac

Lineamientos para trabajo de campo: Gestión del agua en contextos mineros, Caso Las Bambas – Apurímac – Perú

Lugar: Provincia de Cotabambas, distrito Challhuahuacho
 Actores: Comunidades vecinas al proyecto minero Las Bambas Compañía X-strata, estado.
 Responsable: Milagros Sosa /Grupo IWE - Univ. Wageningen
 Contacto – Sur : Centro Bartolomé de las Casas CBC – Cusco (Facilidades y apoyo).

1. Situación de las aguas comunales

Detalle:

Explorar el estatus de las aguas de las comunidades. Observar la forma de obtener acceso al agua, control y distribución (en actividades agrícolas). Analizar las prácticas locales, asignación de derechos y responsabilidades y de autoridad. Si es que han pasado por un proceso de reconocimiento o formalización por el estado. De ser así si cuentan con permisos de uso y/o licencias a títulos personales o comunales y los usos a los que se destinaron las aguas. Así también –si aplica- seguir el accionar de las organizaciones de regantes en la zona. De encontrarse permisos para uso agrícola, si se cuentan con las autorizaciones de uso sobre infraestructura (canales de riego).

2. Esfuerzos de las comunidades por asegurar sus fuentes de aguas

Detalle:

Seguir, reportar y analizar los mecanismos o estrategias que tienen las comunidades que conviven o que están en contacto con actividades mineras para defender/asegurar o garantizar su acceso al agua así como el control/uso de fuentes.

Nota: Se asume que la minería principalmente en su fase de operaciones puede competir por el agua con otras actividades comunales como agricultura y/o ganadería. En el caso de Las Bambas que se encuentra en exploración, observar si las comunidades están tomando algunas acciones para asegurar sus recursos ante inminente explotación minera.

3. Situación de las aguas minero

Detalle:

Actividades mineras actuales y/o potenciales requieren asegurar agua y tierras. En el caso de aguas, observar la situación de concesiones o licencias/permisos gestionados o en gestión por la empresa. Cantidades, fuentes, fines y posible construcción de infraestructura. Esto también podría dar una idea de actuales y posibles conflictos socio-ambientales con comunidades asentadas en la zona que pueden estar haciendo uso de las mismas fuentes o caudal.

4. Primeros impactos o impactos esperados de las actividades mineras

Detalle:

En los recursos hídricos: prácticas, usos & actividades, fuentes, infraestructura

En las comunidades: procesos de polarización, desplazamiento, priorización de otras actividades productivas, migración

5. Situación de conflictos agua, comunidad, minería

Detalle:

Analizar las estrategias empleadas por actores involucrados en conflictos (Negociación, compensación, expropiación, protestas, etc.). Identificar-analizar actores, sus intereses, posiciones, características y contextos –sociales, económicos, políticos y culturales (para entender reclamos y/o demandas). Analizar interacciones o relaciones entre dichos actores.

6. Implicancias de la ley de recursos hídricos (29338) en contextos mineros (si aplica?)

Detalle:

Integrando la problemática de la zona con el contexto nacional y los cambios en la legislación, analizar por ejemplo influencia de la ley, presencia del estado, (consejos de cuenca) –definición de prioridades o actividades a desarrollar en la zona, uso del territorio y recursos (agua, suelo, etc.).

Resumen:

A. Temas potenciales preguntas: Usos del agua (comunidades, empresa), impactos mineros (agua/ comunidades)

B. Niveles de contestación: Recursos / Reglas y derechos/ Autoridad /Discursos

C. Estrategias

Summary

This thesis documents as well as questions how the presence of large mining operations in Andean regions of Peru alters waterscapes and hydro territories. Taking conflicts over water as a useful entry-point for the analysis, it explores and unravels the dilemmas and challenges that the main actors involved have to deal with: rural communities and (representatives of) mining companies, in addition to the state in its various manifestations. Through an in-depth portrayal and analysis of how communities and mining companies navigate these challenges, focusing on those related to water, the thesis sets out to understand what happens with water in contexts of mineral extraction. It traces changes in how water is accessed, controlled and governed, and by whom. By thus making the inherently situated, complex and power-laden character of water politics in mining contexts explicit, the thesis sheds light on how mining reconfigures water governance arrangements, while also contributing to wider debates about water governance in contexts characterized by huge disparities of power.

The thesis is structured in six chapters, with chapters 2 – 5 being previously published separately as peer reviewed articles in scientific journals. Chapters 1 and 6 provide the overall coherence to the thesis by presenting the introduction and the conclusions.

Chapter 1 starts by explaining how it is useful to define and analyze water governance (in contexts of extraction) as consisting of everyday politics, with rural communities and mining companies struggling for water and, at the same time, engaging in messy and contradictory relations of collaboration, cooptation, contestation and conflict. Using this everyday politics lens, the thesis sets out to answer the following research question: *“how does water governance evolve in contexts of large mining operations in the Peruvian Andes?”*. As field work sites the Las Bambas and Yanacocha mining companies in Apurímac and Cajamarca, respectively were selected, as these are the places where highest levels of discontent and conflict associated with mining investments are recorded. Doing fieldwork in such contentious and politically charged environments is challenging, demanding that the researcher – just like the other actors – cautiously navigates positions and interests in attempts to establish relations of trust with all actors, without taking the easy stance of claiming to be neutral or objective.

Chapter 2 shows that the impacts of mining interventions profoundly reconfigure customary and formal water control arrangements around, among, and within rural communities. Zooming in on processes of formalizing water tenure relations in communities neighboring the Las Bambas mining company, it demonstrates the inherent contradictions that accompany these reconfigurations. Although formalization, as a state-endorsed legal instrument, may provide security to some users by officially recognizing their water uses, it also inevitably introduces new political-normative hierarchies between communities and erodes existing local water sharing and management arrangements. The chapter thus highlights that new claims to water provoked by the mining company generate tensions with these communities' arrangements, actually threatening their very existence.

Chapter 3 shows that the operations of the Yanacocha mining company in Cajamarca provoke a fundamental reshuffling of how rights to water are allocated in the area, profoundly changing water access and distribution. The chapter argues that these changes can be understood as a form of water grabbing, since they result in a *de facto* transfer of water control from communities or the state to the mining company, which thus comes to assume responsibility over water allocation. By meticulously describing two contentious cases: La Ramada canal and the San José reservoir, the chapter sheds light on the company's overt and covert strategies to obtain water. These include negotiation with communities; the offering of compensations in return for water rights; as well as replacing 'natural' water with treated water to mitigate for community's loss of access to water.

Chapter 4 illustrates how to solve conflicts and deal with opposition to mining operations, the state and the mining companies make use of a combination of legal and technical strategies. The chapter questions the effectiveness of these strategies, focusing on the sustainability of water resources and rural livelihoods. Using the case of conflicts in Combayo around the Yanacocha mining operations, the chapter shows that although legal and technical conflict resolution strategies effectively diffuse tensions and legitimize mining operations, they do not address the underlying inherently political causes of such conflicts. These conflicts thus continue to simmer in the background, threatening to erupt every time matters of contention surface. The chapter states that instead of those 'objective' quick solutions, solving conflicts around

mining operations requires explicitly admitting and dealing with the fact that they are inherently political, situated, and power-laden.

Chapter 5 uses illustrations from the large gold mine, Yanacocha, to assess the effectiveness of institutional mechanisms for safeguarding the sustainability of water resources, and water-based ecosystems, in mining regions. The chapter shows that in these regions, the sustainability of water is mainly regulated through upward forms of accountability, those that depend on the mining company's compliance with national and international regulations. These forms of accountability dismiss and ignore existing 'local' knowledge (and associated ways of living with and caring for water) of communities affected by mining. The chapter concludes that the preservation of water and ecosystems requires enabling institutions that combine existing upward forms of accountability with more downward ones that endorse the experiences, rights and knowledge of those affected by mining.

Chapter 6 summarizes and discusses the major findings of the research and shows how these contribute to larger theoretical and policy debates on water governance. Considering water governance as everyday practices, this thesis highlights that in contexts of mineral extraction (a) Mining developments reconfigure local water governance arrangements with contradictory consequences for affected communities; (b) Mining companies become the *de facto* water managers responsible for water access and distribution in areas they operate (c) Compliance to the law and the use of technology are used as strategies by the mining companies to legitimize their actions and impacts, allowing them to continue with business as usual; (d) The preservation of water based ecosystems requires downward forms of accountability, that is to say institutions that endorse experiences, rights and knowledges of those affected by extraction. The chapter discusses the implications of the research for water governance practices, and presents reflections about ways to understand water governance arrangements as everyday politics.

In sum, the thesis is a contribution to practice-based theorizations of water governance. Its main practical conclusion is its emphasis on the need to create countervailing powers and expertise to those of mining companies – state alliances through mechanisms and networks that empower local communities, helping them to

Summary

effectively contest, engage in discussion and debate with and deal on more equal terms with their nasty neighbours.

Acknowledgments

At this moment, while writing the last section of the thesis and remembering how much I have grown -metaphorically speaking of course!- and learned, mixed feelings invade me. I am happy because I finally end this PhD 'chapter', but at the same time I am a bit nostalgic to end a 'chapter' that allowed me to learn and develop by doing many things and particularly by interacting with many people. Thus, I would like to take this opportunity to express my gratitude to them.

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About the author

Gisela Milagros Sosa Landeo was born in Huancayo, Peru on February 14, 1979. She studied Biology with specialization in Ecology at Universidad Nacional Agraria La Molina (UNALM), Lima, Peru (1997 - 2002). She was working as a project assistant at the International Affairs Office at the UNALM, from 2005 to 2008 she did her MSc in International Land and Water Management at the Water Resources Management group (former Irrigation and Water Engineering group) at Wageningen University, The Netherlands. As part of these studies, she did her internship in the Philippines on topics related to water management and water rights, visiting indigenous communities, civil organizations and government offices on Luzon and Mindanao islands. Her MSc thesis was on water conflicts among indigenous, farmer communities and urban districts in the Chimborazo province in Ecuador. After receiving her master's degree she collaborated on writing a PhD proposal that was granted by the NWO-WOTRO Science for Global Development programme: "Struggling for water security: Social mobilization for the defence of water rights in Peru and Ecuador." She is actively engaged with state, civil society and environmental organizations in Peru. She is member of the Water Justice – *Justicia Hídrica* research network and the Latin American Studies Association LASA.

After the submission of this thesis, Milagros is working as a researcher/advisor on topics related to water governance, stakeholder engagement, climate change and mining.

Publication list

Sosa, M., Boelens, R., and Zwarteveen, M. 2017. "The influence of large mining: restructuring water rights among rural communities in Apurímac, Peru". *Human Organization* 76(3): 215-226.

Sosa Landeo, M. Forthcoming. Caso del proyecto minero Las Bambas, Perú. In: *Agua, equidad y justicia*. J. Budds and C. Roa-García (eds.) Justicia Hídrica. Lima.

Sosa, M. and Zwarteveen, M. 2016. "Questioning the effectiveness of planned conflict resolution strategies in water disputes between rural communities and mining companies in Peru." *Water International* 41(3):483-500.

Sosa, M. and Zwarteveen, M. 2014. "The institutional regulation of the sustainability of water resources within mining contexts: accountability and plurality." *Current Opinion in Environmental Sustainability* 11: 19-25.

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Hoogesteger, J., Sosa, M., Verzijl, A., Manosalvas, R., Zwarteveen, M. and Boelens, R. 2014. "Water security struggles in the Peruvian and Ecuadorian highlands". *Global Water Forum*.

Hoogesteger, J., Manosalvas, R., Sosa, M., and Verzijl, A. 2013. Nuevas escalas de acción: organizaciones y seguridad hídrica en los Andes. In: *Agua e Inequidad: Discursos, políticas y medios de vida en la región andina*. J. Hoogesteger and P. Urteaga (eds.). Lima: IEP. 21-43.

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Sosa, M. and Zwarteveen, M. 2012. "Exploring the Politics of Water Grabbing: The Case of Large Mining Operations in the Peruvian Andes". *Water Alternatives* 5(2): 360-375.

Sosa Landeo, M. 2012. La influencia de la gran minería en Cajamarca y Apurímac, Perú: Acumulación por despojo y conflictos por el agua. In: *Agua, injusticia y conflictos*. E. Isch López, R. Boelens, and F. Peña (eds.). Lima: IEP. 63-79.

Sosa, M. and Zwarteveen, M. 2011. Acumulación a través del despojo: El caso de la gran minería en Cajamarca, Peru. In: *Justicia Hídrica: Acumulación, Conflicto y Acción Social*. R. Boelens, L. Cremers and M. Zwarteveen (eds.). Lima: IEP. 381-392.

Gisela Milagros Sosa Landeo

Wageningen School of Social Sciences (WASS)

Completed Training and Supervision Plan



Wageningen School
of Social Sciences

Name of the learning activity	Department/ Institute	Year	ECTS*
A) Project related competences			
Writing TSP and Proposal	WRM, WUR	2009	3.0
Centro Bartolomé de las Casas, Water Justice International Seminar	WRM, CBC, Cusco, Peru	2009, 2010, 2012	5.0
Where research meets policy and practice	CERES summer school, Radboud University	2009	1.0
<i>'Accumulation by dispossession: Large mining industry in Cajamarca, Peru'</i>	8 th Development Dialogue Conference, ISS	2010	1.0
<i>'Water management within mining context in the Peruvian Andes Action research?'</i>	WRM, WUR	2010	0.5
<i>'Minescapes as spaces of both dependences and contestation: The Combayo conflict in Cajamarca, Peru'</i>	AAG, New York	2011	1.0
<i>'Negotiating and controlling water: The case of large mining industry in the Peruvian Andes'</i>	ISS & AAG, Seattle	2010, 2011	1.0
Stakeholders Workshop, Lima	WRM, WUR	2013	1.5
<i>'Mining Conflicts and their implications for water governance: The Combayo case in Cajamarca, Peru'</i>	WASS PhD Day	2013	1.0
<i>'In between communities and mines Problems, challenges and opportunities of doing fieldwork in areas influenced by large mining operations in Peru'</i>	WRM, WUR	2013	0.5
Executive Training Role of Foreign Direct Investments for Development: Legal, Social and Economic Aspects.	EUI, Florence	2013	1.0
<i>'Dealing with water, rights and mining: Implications for equitable water governance in Peru'</i>	Utrecht University	2014	1.0

MOOC Natural Resources for Sustainable Development: The fundamentals of oil, gas and mining governance	SDSN Edu	2016	1.0
<i>'Questioning the effectiveness of planned conflict resolution strategies in water disputes between rural communities and mining companies in Peru'</i>	PE&3C International Conference, Wageningen	2016	1.0
<i>Water governance and the influence of large mining: Restructuring water rights among rural communities in Apurímac – Peru'</i>	LASA, Lima, Peru	2017	1.0

B) General research related competences

CERES Orientation	CERES	2008	5.0
Presentation tutorials	CERES	2008	5.5
A practical course on the methodology of fieldwork	CERES	2008	2.0
Techniques for writing and presenting a Scientific paper	WGS	2009	1.2
Atlas ti, a hands-on practical	WASS	2010	0.5
Master class: Negotiation Theory and Practice	WASS	2016	0.5

C) Career related competences/personal development

Research visit Syracuse University	Syracuse University	2012	1.0
Guest lectureship Institutional Analysis for water governance module	UNESCO – IHE, Delft	2014	1.0
Guest lectureship An Interdisciplinary Approach to Reduce the Negative Impact of Mining CATAPA-workshop	KU Leuven	2016	1.0
Guest lectureship Inter-sectorial water conflicts workshop. Water and mining at the local level: The case of Peru	Water HUB – UNIGE, WMO	2016	1.0

Total	39.2
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*One credit according to ECTS is on average equivalent to 28 hours of study load

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