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Small-scale gold mining, mercury exposure and the Struggle for the Right to Water in the Peruvian Amazon

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Small-scale gold mining, mercury exposure and the Struggle for the Right to Water in the Peruvian Amazon[2]

Since the 2008 financial crisis, increase in global demand and the price of gold have led to an expansion of industrial and artisanal gold mining (Swenson et al., 2011; World Gold Council, 2010). Worldwide, Artisanal and Small-Scale Gold Mining (ASGM) is carried out by an estimated number of 15 million miners in more than 70 countries (UNEP, 2015; Diringer et al., 2014) and accounts for 15 percent of the world gold production (Telmer, 2011). In Peru – which is currently the sixth largest gold producer in the world and the first in Latin America (Mujica, 2014) –, 70 percent of national artisanal gold production is mined in the department of Madre de Dios, located in the southwestern Amazon basin (Brooks et al., 2007).

Since the 2000s commodities boom, Madre de Dios, considered one of the most biological places on the planet, has indeed experienced a rapid development of ASGM operations which have transformed large expanses of rainforests into denuded and mercury-poisoned wastelands (Asner et al., 2013; Elmes et al., 2014; Román et al., 2015). It is estimated that as many as 30.000 miners are working in this region (Fraser, 2009) and are using mercury to recover gold from the river sediments or solids extracted. Numerous studies show that mercury levels found in fishes and inhabitants of Madre de Dios are above the maximum levels recommended by the

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World Health Organisation (WHO) (Damonte et al., 2015; Diringer et al., 2014; Ashe, 2012), therefore due to ASGM, artisanal miners as well as local population are exposed to dangerous levels of mercury contamination.

As a consequence, socio-environmental conflicts between miners and downstream population (farmers, indigenous communities, logging concessions, reforestation, conservation or ecotourism concessions) are increasing in Madre de Dios, especially water-related conflicts. Indeed, because of the mercury use and mining techniques, ASGM causes serious violations of the Right to Water and Sanitation – declared fundamental human right in 2010 - and leads to numerous conflicts linked to access to and defense of water resources.

Little is known in Madre de Dios about water conflicts between miners and logging concessions. In fact, mercury is known to cause many conflicts with indigenous communities, farmers, reforestation/ecotourism concessions, but at present there is little empirical data to describe the relations between miners and logging concessions and their respective strategies regarding to water. So the aim of this article is to examine the principal components of water struggles between miners and logging concessions in the Peruvian Amazon (Madre de Dios) and by what means these struggles are resolved. In this sense, this study addresses the following questions: (1) What are the triggers of these water-related conflicts and their main characteristics? (2) How are these conflicts carried out? (3) What are the different interests at stake and their link with the Right to Water and Sanitation? (4) What are the strategies established by the two parties in order to resolve the conflicts?

Methods

1. Study area

The Madre de Dios Department is located in the headwaters of the tropical Amazon in the Southeastern Peru, bordering Brazil and Bolivia. It is one of the world's biodiverse region and is Peru's designated "Capital of Biodiversity" (Federal Law 263111). Madre de Dios is in fact recognized as a prioritized biodiversity hotspot for conservation (Myers, 2001) due to its remarkable wild fauna and flora and its

relatively low deforested area (4.75%). In addition to this high biological value, Madre de Dios also has a rich mosaic of cultural diversity, including indigenous communities and some of the last uncontacted indigenous groups living in voluntary isolation (Shepard et al., 2011 ; Huertas, 2002). Around 3% of the population is indigenous, made up of eight different ethnic groups organized into 24 recognized native communities (Brack, 1997). Prior to mid-1940, the department had few inhabitants and low development. However, the department has experienced a significant growth for the last sixty years (its population increased more than fourfold between 1940 and 2007 – INEI, 2007), due to the construction of a road leading into the region, government subsidies for agricultural expansion (Cronkleton and Larson, 2015 ; Chavez and Perz, 2012) and the successive extractive "booms": wood, Brazil nut and gold.

Small-scale gold mining, appeared in Madre de Dios in the 1930s, has been its main economic activity since the boom of the 1970s. However, with the significant increase in the international gold price in the 2000s, a real gold rush has occurred in the department: ASGM and its opportunities of rapid enrichment have been attracted thousands of people. According to Ashe (2012), "*poor migrants from different regions of Peru are flocking to the Amazonian department of Madre de Dios to find their fortune as artisanal gold miners*". In 2007, the number of immigrants amounted to 44,985, which was 56% of the total population that year (INEI, 2007), most of them coming from the Andes (Cusco and Puno departments) driven to Madre de Dios by a lack of economic opportunities, poverty and unemployment, in their village or district. Therefore, due to immigration, Madre de Dios has currently the highest population growth rate in Peru (4.8%), almost 2.5 times the average national growth rate (INEI, 2007), most of it dedicated to ASGM. Unconfirmed reports have estimated that ~95% of gold operations in the department are illegal because the miners either lack the proper permits to run their operations or because they are working outside authorized mining concessions (Keane, 2009). Since 2012, the central government has tried to regulate ASGM in Madre de Dios by promoting the formalization of some 30 000 illegal miners who are working in Madre de Dios

(Urgent Decree 012, Legislative Decrees 1100 and 1102[3], Supreme Decree 013-2015 among others) but its actions have led to intense social and political conflict. Indeed, mining activity has created tens of thousands of local jobs, generates an estimated US$369 million in annual revenue (Mosquera et al., 2009) and makes up nearly 50% of all regional economic activity (GOREMAD, 2009). Due to these jobs and revenues generated as well as the growing demographic weight of immigration, local mining industry has become the region's dominant socio-political force (Scullion et al., 2014). As a matter of fact, in 2014, a candidate backed by miners' groups – Luis Otsuka – was elected as Governor of Madre de Dios. Former head of the illegal miners' union and owner of several mining concessions in the department (Torres, 2016), Luis Otsuka often leads the regular miners' protests and strikes against the formalization norms (and use of force) promoted by the Peruvian government since 2012. As a result of his policies, the state-driven formalization of ASGM has not made significant progress in the department and remains at a standstill.

Within this social and political context, the different population groups of Madre de Dios are extremely vulnerable to mining activities. Indeed, ASGM not only impacts the native communities or groups living in voluntary isolation in protected areas or communal reserves, but also a variety of local actors from farmers to reforestation, ecotourism, brazil nut harvesting, conservation and logging concessionaires. To better understand these impacts and, further on, the water struggles between the logging concessionaires and miners, it is here important to mention that in Peru, concessions have been granted by the government (or other controlling authority) to individuals or organized enterprises since 2001 in order to improve sustainable forest management (SFM). In this sense, these concessions can be seen as a delegation to the private sector for fulfilling certain missions of public service – SFM – against the right to get financial benefits from their respective activities (reforestation, ecotourism, Brazil nut harvesting, conservation or logging) (FAO, 2001). Regarding to logging concessions, they have been granted to small and medium-scale loggers

[3] The national government declared through LD 1100 that taking actions against illegal mining was a national priority and later the same month enacted LD1102 which incorporates both illegal and informal mining into Peru's penal code and set sentence guidelines for convictions.

since 2002, making them stakeholders of the forests of the Amazon region. These concessions, awarded through public bidding, are thus areas of public land that are designated for permanent timber production. A concession contract is valid up to 40 years and implies the payment of an annual area-based harvesting fee. In addition, "*logging practices of concessionaires are evaluated every 5 years to ascertain compliance with an Approved Forest Management Plan (PGMF) for the whole concession area, and an Annual Operational Plan (POA) for the annual authorized harvesting area*" (Smith et al., 2006).

2. Data collection

The study was carried out in Madre de Dios from February to May 2012 and consisted of a mixed–methods approach combining structured questionnaire, semi-structured interviews, direct observation and a review of secondary sources. Indeed, first of all, primary data was collected through a structured questionnaire administrated to eight logging concessionaires located in the Tambopata province, along the Madre de Dios River. The aim of this questionnaire was to determine the geographic localization, financial situation, management characteristics as well as opportunities and threats to the logging concession. Second, semi-structured interviews with regional government agencies, NGOs, university researchers, mining enterprises, independent miners, forestry professionals and logging concessionaires, as well as primary data sources produced by them, complemented the survey. Third, a field visit/evaluation of the logging practices was carried out in each of the eight logging concessions mentioned above, as well as a direct observation of environmental degradation (mercury contamination of water, deforestation, etc.) caused by informal/illegal miners within the logging concession. Finally, information on ASGM, SFM, Right to Water and water conflicts in Madre de Dios was obtained from secondary sources as well as from informal discussions with inhabitants of the study area (miners and their wife, shop or restaurant holders, national parks wardens, etc.).

Water rights and water fights: an analytical framework

Discussion of water conflicts between logging concessions and miners, due to serious violations of the Right to Water and Sanitation (RTWS) in ASGM, requires first a short introduction to two key concepts: RTWS and water-related conflicts.

1. Right to Water and Sanitation

Internationally, water and sanitation have been for long time a side issue on the international agenda, ignored in the debate about human rights (Kirschner, 2011). It was not until 2002 that the UN Committee on Economic, Social and Cultural Rights and its general comment No. 15 expressed the right to water as the "*right of everyone to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses*" (UN, 2010). Based on that definition and as a result of several conferences on Water during the 2000s, the Right to Water and Sanitation is finally recognized as a fundamental human right in 2010 by the UN General Assembly Resolution[4].

Legally, the Right to Water implies three principal aspects[5] : availability, quality and accessibility. First, water must be supplied in sufficient quantity for personal and domestic needs; second, it must be of adequate quality. "*The water required for each personal or domestic use must be safe, therefore free from micro-organisms, chemical substances and radiological hazards that constitute a threat to a person's health*"[6]. Third, water and water facilities must be accessible to everyone without discrimination (physical, economic and information accessibility).

These aspects are the key characteristics of the Right to Water and Sanitation (RTWS) and must be respected, protected and fullfilled by all member States[7]. Indeed, among others responsabilities, States must ensure individuals or corporate bodies do not infringe the water rights of others. In several countries, as a result of the decentralization process, "*the same three obligations apply to the local governments*

[4] A/RES/64/292, see note 6.

[5] E/C.12/2002/11, para. 12 (b).

[6] E/C.12/2002/11, para. 12 (b).

[7] E/C.12/2002/11, paras 23-24.

because they are part of governement or because the national Government has delegated power to them" (UN, 2010).

In this sense, national and/or local governments are in charge of the effective implementation of the RTWS. This implies, apart from a comprehensive regulatory framework, the establishment of "*accountability mechanisms especially including means of judicial or quasi-judicial implementation*" (Kirschner, 2011). Indeed, the RTWS has to be recognized and incorporated into the national legislation but also requires the enforcement of that right, granting an effective judicial protection[8]. The creation of enforcement mechanisms and implication of judicial bodies is what Olmos and Paz (2014) call the "justiciability" of the RTWS. In Peru, the RTWS as such has no explicit recognition in the Constitution. However, under Article 55 of the Constitution, the main international human rights treaties enjoy constitutional hierarchy[9]. Thus, the RTWS is implicitly recognized through universal human rights instruments. Moreover, the right to water is also guaranteed in the internal Water Resources Law (2009) through different principles contained in its article 3[10]. Finally, in 2007, the Peruvian Constitutional Court recognized the drinking water as an unenumerated right, according to article 3 of the Constitution. As a consequence, the RTWS is made justiciable through remedies; right holders should be authorized to make special claims if their RTWS is threatened or denied.

2. Water conflicts

In Latin America, and particularly in the Peruvian Amazon basin, water rights can become very contentious issues. Indeed, conflicts related to access to or defense of water resources are increasing and in most cases result from opposing interests of water users, public or private. Conflict refers here to a situation where at least two

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[8] Harvard Law Review *"What Price for the Priceless?: Implementing the Justiciability of the Right to Water"*, Harvard Law Review, vol. 20 num. 4, 2007, p.1077

[9] Constitution of Peru, Article 55: *"Treaties formalized by the State and in force are part of national law"*.

[10] For example: Water Resources Law, art. 3, para. 2 : *"El acceso al agua para la satisfacción de las necesidades primarias de la persona humana es prioritario por ser un derecho fundamental sobre cualquier uso, inclusive en épocas de escasez"*.

parties interact in an incompatible way, so that at least one of the parties experiences damage from the incompatible interaction as stemming from the other party (Glasl, 2002; Coser, 1956). Regarding to the water-related conflicts, Figueroa (2003) considers that there is a significant interdependence between water users: the behavior of some directly affects the others. According to Wolf and al. (2005) and Estrada (2012), while the underlying reasons for water disputes can be numerous (such as power/control struggles and competing development interests), the most direct link between water and conflict can be attributed to the need for access to water of *adequate quantity* and *quality*. First, a water conflict can appear when a resource is scarce (users compete for a limited quantity) (Mason, 2004). Second, low quality – caused by contamination, suspended solids, excessive levels of salt, etc. – is another source of dispute: unclean water can be a serious threat to human and ecosystem health (Kramer, 2004). In general, water quality degradation implies conflicts between two groups: those who cause the degradation and those affected by it.

Artisanal small-scale gold mining, violations of the RTWS and water conflicts between miners and logging concessionaires in Madre de Dios

Nowadays, the inhabitants of Madre de Dios can be divided into two large categories: the original inhabitants of Madre de Dios who are indigenous Amazonians living in communities recognized by the State, and settlers/migrants (mainly from the Andes) working in agriculture, mining and forest management on either private land or state-approved concessions. According to GOMIAM (2015), these population groups live alongside one another "in a tense environment that sometimes evolves into conflict over resources". Among those, water conflicts between miners and logging concessionaires (both from the second category) are numerous in Madre de Dios and are originated by the use of mercury in ASGM activity. Indeed, during the mining process, mercury is added to large quantities of sediment and soils that have been extracted from riverbanks and forested areas by means of artisanal techniques (mills, sweepers, etc.) or semi-mechanized techniques (water and solid suction, front-loading chutes, lance style sweepers, etc.). At that stage, mercury forms a strong bond with gold particles, called "amalgam" (Damonte et al., 2015). In order to accelerate the

amalgamation, miners generally mix the amalgam while barefoot and handle the liquid mercury with bare hands, coming into direct dermal contact with that chemical element. Then, the gold-mercury amalgam is heated over an open flame, in mining site or in gold shops in town, in order to separate the metals. By doing so, mercury vapors are released to the air, increasing the risk of pollution in the soil, water, animals and humans (Román et al., 2015, Diringer et al., 2014; Ashe, 2012). Thus, regarding to humans, mercury exposure can be dermal, by inhalation of vapor or intake of animal products that contain high levels of methyl-mercury (fishes for example). According to Ashe (2012), the population living downstream from the mining camps – like logging concessionaires – are generally exposed through the latter two pathways, which may cause them serious health problems (harmful effects on the nervous, digestive, respiratory and immune systems, mental and muscular deficiencies, memory loss, skin desquamation, birth defects, early death, microcephaly, etc.). For all these reasons, in Madre de Dios, logging concessionaires consider that ASGM is a threat and violates their Right to Water and Sanitation by affecting the water quality. As it was described above, the RTWS implies three aspects (sufficient quantity, adequate quality and accessibility) and according to the second aspect, everyone must have access to safe and acceptable water, free from chemical substances. Thus, by contaminating waters with mercury, miners do not respect the logging concessionaires' RTWS, which leads to water-related conflicts between them.

In this study, water conflicts were observed between logging concessionaires and either informal or illegal miners. On the one hand, conflicts may appear with informal miners as a result of multiple overlapping land-use rights (Cronkleton and Larson, 2015). In fact, in Madre de Dios, there is little coordination among regional government agencies responsible for granting rights for mining and logging concessions. They lack a common information system, therefore agencies allocate mining and logging rights on a same land without verifying pre-existing claims. However, these miners are not formal, they hold permits issued by local government authorities on logging concessionaires' land but these documents are only the first step in the titling process and formalization. In the eight logging concessions studied,

miners did not pursue additional steps (environmental study, taxes, respect of labor regulations, etc.) and were left with an "informal title" that officially does not give them legal property rights. On the other hand, water conflicts may also appear between logging concessionaires and illegal miners who invade the concession and start to work without any land right, mining license or exploration permit. Their incursion initially consist of a few miners who clear the primary forest in order to make space for more miners (and their engines) and then gradually open up new mining areas in the concession. Logging concessions are miners' ideal targets because "*these are typically located several miles from the roads in order to prevent access by government officials*" (Ashe, 2012).

Considering this, logging concessionaires and miners have thus opposed interests regarding to land-use (timber exploitation VS deforestation and soil extraction), but also regarding to water. While the miners' main concern focuses on accessing to sufficient water resources in order to carry out their extractive work, logging concessionaires insist on defending their RTWS and accessing to water of adequate quality. ASGM indeed requires large quantities of water and implies a direct access to either a river, lake, basin o small swamp. Without water, gold extraction is not possible. In this sense, miners' interest consist of an access to water of *adequate quantity*. Regarding to the logging concessionaires, their principal concern is to live in a healthy environment, free from mercury, and to have access to safe water. To that strategy can be added an economic goal: getting financial benefits from the logging activities; however, if the miners contaminate their water resources and soils, the quality of their forests decreases as well as the price they can get from timber sales. This is a real threat to them considering the fact that, in Madre de Dios, most of the logging concessions already have serious financial and administrative issues (they cannot pay their annual area-based harvesting fee and they do not have their PGMF or POA realized/approved). So it is crucial they have access to water of *adequate quality*, for both their personal well-being and economic activity.

These opposed interests are at the root of water conflicts between miners and logging concessionaires in Madre de Dios. However, these conflicts did not often turn into direct and violent confrontations. Indeed, miners as well as concessionaires develop

their own strategies to resolve water conflicts. These include legal instruments as administrative complaints with the competent authorities and trial, alternative dispute resolutions such as negotiation (Menkel-Meadow, 2015; Shavell, 1995) or extra-legal methods (threats, corruption, etc.). According to the second article of the Peruvian Constitution (1993): "*every person has the right to a balanced and appropriate environment for the development of his life*". In this sense, any logging concessionaire can bring complaints to the competent authorities in case of environmental degradation in his concession or violation of his RTWS. In Madre de Dios, as part of the decentralization process, these complaints have to be brought to the regional Agency for the Supervision of Forest Resources and Wildlife (OSINFOR), which is supposed to examine them, verify the content of complaints by a field visit in the concession, and if needed transfer them to the judiciary (Araujo, 2012). However, in practice, it seems that the enforcement of that legal procedure remains poor. Previous studies found inconsistencies between regulations and actual practices and outcomes in the field, due to governance failures and little involvement of local institutions (Sears and Pinedo-Vasquez, 2011; Smith et al., 2006). Concessionaires complain that OSINFOR has been unable to resolve disputes arising from invasions or mercury contamination and that they have suffered from long administrative delays and costs as a result of their complaints (Smith et al., 2006). Indeed, all the concessionaires interviewed agree to say that either the OSINFOR never responds to their complaint (and when it does, the answer arrives several months later – there is a real lack of responsiveness) or that the field visits to verify the invasions or contamination were not a public service but had to be paid by the concessionaires themselves (transport, food, accommodation fees, up to 1000 soles). Torres (2003) confirms these facts; according to him, the financial budget and human resources allocated to OSINFOR is inadequate to prevent invasions and supervise concessions. Staff is not sufficiently trained and often changes due to problems related to corruption. Indeed, miners' common strategy to make the concessionaire's complaints go away is to bribe the OSINFOR officials. This allows them to pursue their extractive activity in the logging concession while remaining legally unpunished. For that reason, logging concessionaires also consider that despite the obligation for the regional government

(GOREMAD[11]) to respect, protect and fulfill the RTWS, it does not oversee its implementation. Indeed, the RTWS is impeded by a lack of political will from the GOREMAD. As we described earlier, local mining industry has become the region's dominant socio-political force, therefore impunity is granted to miners and no effort has been made to protect the logging concessionaires' RTWS. Moreover, an effective implementation of the RTWS would require clarity on the distribution of responsibilities between the central and regional governments. However, the process of decentralizing facilities to regional governments has been slow and problematic in Peru, which has led to an inertia of the GOREMAD regarding to the RTWS. Indeed, some logging concessionaires expressed a lack of confidence that government authorities would defend their right. On the contrary, some others were unaware of their rights, which means that there is also a lack of transparence about the RTWS and the possibility of complaint in case of violations. Another element that complicates concessionaires' legal remedies is the lack of clear property rights in Madre de Dios (and in the Amazon region in general) (Cronkleton and Larson, 2015). As we said earlier, some mining concessions overlap existing logging concessions, which means that the logging concessionaires do not have clear land-use rights over their concession. This complicates legal remedies and makes it difficult to produce satisfactory outcomes for the concessionaires. The miners are well aware of that situation and take advantage of it by invading even more the concessionaires' land, preventing them from going into their concession or threaten them to death (verbal attacks).

As a result of all these governance failures and weak State presence, most logging concessionaires do not resort to legal complaints anymore and avoid expensive trials before courts. Indeed, as government agencies do not comply with their obligations, logging concessionaires seek better outcomes than those commonly provided by the formal justice system and therefore tend to develop informal codes of practice with miners in order to overcome administrative delays or costs and resolve invasion disputes. These codes implies an alternative dispute resolution: negotiation, being

[11] Regional Government of Madre de Dios.

defined as "any form of direct or indirect communication whereby parties who have opposing interests discuss the form of any joint action which they might take to manage and ultimately resolve the dispute between them" (Law Society of Upper Canada, 1992). In this case, logging concessionaires and miners negotiate in direct communication – on the field (concession) – a financial agreement that consists of a bride given by the miners to the logging concessionaires in exchange for the quality loss of their water resources. So the miners pay a financial compensation for the violations of the concessionaires' RTWS, which generally involves the payment of a "*regalia*", a royalty equivalent to a miner's working day per week or 10% of the gold extracted by the miners on the logging concession per day. This situation corresponds to what Bebbington (2009) calls "*livelihood based environmentalism*" and Martínez-Alier (2002) "*environmentalism of the poor*": negotiation can always resolve a conflict if one of the parties accepts a compensation for the loss of access to a resource or the substitution of a resource by another. In this case study, negotiation is chosen by the logging concessionaires for all the reasons that have been exposed above (governance failures, regional institutions' weakness and lack of responsiveness, expensive costs and delays of the formal justice system, etc.) but also because bribes solve their financial issues. Indeed, most of the logging concessions are failing to pay annual timber extraction fees and are indebted, the royalty paid by the miners thus enables them to pursue their economic activity. In others words, concessionaires accept a financial compensation for the loss of access to safe water. On the other hand, resolving conflicts by negotiating and bribing is a commonly accepted practice among miners because it prevents them to be put on trial and imprisoned. Furthermore, negotiation allows them to develop long-term relationships with logging concessionaires and by authorizing them to work in a logging concession for several months, provides them a steadier and safer job. In this sense, in Madre de Dios, an active resistance against ASGM and extractive activities does not exist. Unlike the water-related conflicts observed in other departments of the country, in Madre de Dios, water struggles do not question the extractive development paradigm, on the contrary, due to a weak regional governance, logging concessionaires' resistance

against miners rises up in order to get financial compensation for the loss of access to their water resources.

Conclusions

In Madre de Dios, ASGM is currently reconfiguring the socio-political landscape of the department as well as its environmental characteristics. Indeed, nowadays, miners' groups (mostly settlers or migrants) have growing influence within the regional government and represent a large part of the departmental population. As a consequence, ASGM has grown significantly since the 2000s commodities boom, becoming a major driver for land degradation and deforestation as well as mercury contamination. This study shows that ASGM does not respect the Right to Water and Sanitation in the department (yet recognized fundamental human right by the international community), and especially the logging concessionaires' RTWS, by violating its second feature: adequate quality of water resources. This violation (due to mercury use, combined with overlapping land-use rights and illegal invasions), currently leads to water struggles between logging concessionaires and illegal/informal miners, which are the result of opposed interests regarding to water (access to water of adequate quantity versus access to water of adequate quality).

Our results also suggest that the parties pursue these interests through non-violent strategies, including verbal arguments as well as legal, extra-legal and alternative dispute resolutions. As far as miners are concerned, extra-legal strategies are generally preferred, such as threats (to death), corruption of OSINFOR officials or verbal assaults. Regarding to logging concessionaires, they first opt for legal instruments by lodging administrative complaints with the OSINFOR. However, considering regional governance failures (lack of enforcement and transparency of the RTWS, weak State presence, OSINFOR administrative delays and costs, or confused land-use rights), they finally choose an alternative dispute resolution: negotiation. They negotiate with miners and accept to lose their access to safe water in exchange for a financial compensation. In Madre de Dios, bribing is indeed a common strategy among miners but it seems to be accepted by both parties. In conclusion, because of the weak regional governance and absence of political will to control and regulate

ASGM, extractive activities are not questioned by logging concessionaires in this part of the Amazon region, on the contrary, the extractivist model seems to emerge victorious from these conflicts. As a result, the exceptional biodiversity of the region and the health of its population are at risk; to prevent this, the national government and the GOREMAD should begin to clarify their respective responsibilities and roles in order to ensure that regulations designed to protect the RTWS are enforced. Also, awareness raising, access to information and transparency about the RTWS should be promoted. In addition, improving the enforcement of legal procedure regarding to administrative complaints would also mean increasing the budget allocated to the OSINFOR. Finally, preventing conflicts would entail developing mechanisms to ensure that new land-use rights are not granting in existing concessions. Instead of gathering and storing data differently, all agencies involved in forest management and granting land-use rights (including Ministries of Agriculture, Environment and Energy and Mines, as well as the GOREMAD) should develop a consistent and unique system enable them to share and compare data among themselves.

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