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Mining conflict and rent-seeking in China: A mixed method analysis of cases of illegality

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ABSTRACT

Research on mining conflict frequently approaches the subject either through in-depth case-studies or numerical analyses of the frequency of disputes. Yet, a more comprehensive understanding of mining conflict could be achieved through mixed methods, whereby qualitative and quantitative approaches are combined. To substantiate this, the article focuses on China, one of the world's largest mineral producers, while using an approach that couples qualitative assessment of case-studies with a quantitative analysis of legal cases through the Conflict Analysis Model (CAM). The study is based on a data-set containing 204 case-studies on mining conflicts. The CAM established: (1) over half of the cases stem from unlicensed mining, partly due to villages' discretionary power over land, which enables them to grant mining rights while surpassing competent authorities; (2) a decline in the number of cases since the early 2010s, likely attributable to the government's crackdown on artisanal mining. The qualitative case-study approach ascertained that mining conflicts are not a straightforward, mono-dimensional matter of state versus society but consist of multi-layered networks between government, companies, and farmers, pitting different levels of government and society against each other. These networks are driven by, what can be termed, the "economics of rent-seeking."

1. Introduction

China is endowed with abundant mineral resources, amounting to a total of 173 different confirmed minerals (Ministry of Natural Resources, 2020). In recent years, the country's scale of mineral exploitation has rapidly expanded, leading to a rise in mining-induced conflict (Yang and Ho, 2019). Conflict over mining attracted the attention of the Chinese nation's highest leadership, and both President Xi Jinping and Premier Li Keqiang have on separate occasions expressed concerns (Li et al., 2019). Research has examined various aspects of Chinese mining-related conflict, including the distribution of benefits between local government, enterprises, and farmers (Chen et al., 2016), illegal and rent-seeking behavior (Lu, 2014), policy credibility and mass protests (Li and Zhou, 2014), litigation (Wang and Yuan, 2013; Zhang, 2019), and spatial distribution (Feng et al., 2016).

Existing research is generally limited to a single methodology, opting for either a quantitative or a qualitative approach. On the one hand, we find studies that examine single or multiple case-studies based on descriptive research, which due to their stringent focus can go into analytical depth, thereby uncovering underlying mechanisms, drivers, or processes (Pu and Scanlan, 2012; Zeng and Liao, 2015; Zhan, 2013). However, such studies may encounter greater difficulty in achieving a macro-level understanding of conflict. On the other hand, we also find studies that aim for generalization – including modeling studies aiming to predict (Welsch, 2008), which typically measure conflict in terms of frequency or quantity (Chen et al., 2016; Li, 2014; Lu, 2014). Yet, the limiting factor of assessing conflict through frequency or quantity is that it might be too mono-dimensional to capture the essence of conflict. This may be demonstrated with a few illustrations.

If a village is affected by ten disputes each involving two persons, how does that compare to a village affected by a single dispute involving the entire community? Likewise, if a village is affected by ten disputes each of which resolved within a week, how does that compare to a village affected by a single dispute that lasts for a decade? Through these examples it becomes evident that a deeper understanding of conflict ought to be assessed through more indicators than frequency or quantity alone.

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Furthermore, even though quantitative research can describe trends at higher levels of aggregation, it may fall short of capturing underlying mechanisms or processes. For instance, how does a mining conflict play out when some villagers profit from mining by working in or running an illegal quarry, while others from the very same community, suffer from its environmental effects? Similarly, how are different levels of government tied into networks of rent-seeking over mining when some levels are trying to enforce the law, while others are trying to break it?

To address these issues, this article proposes a more comprehensive assessment of resource conflict through mixed methods (Brannen, 2005; Creswell and Plano Clark, 2007), which couples qualitative study with quantitative analysis. The former will conduct a descriptive analysis of actors, networks, and rent-seeking processes, based on the examination of three mining case-studies, respectively, from the provinces of Sichuan, Fujian and Guangdong. The latter is achieved through the Conflict Analysis Model (or CAM), developed under the theory on institutional function, also known as the credibility thesis (Ho, 2014; 2017). This theory aims to assess the functionality and support for policies and institutions with respect to land, natural resources, and property (Arvanitidis and Papagiannitsis, 2020; Celhay and Gil McCawley, 2020; Davy, 2018; Fan et al., 2019; Fold et al., 2018; Mollinga, 2016). An important, but not sole, indicator for credibility is conflict, which the CAM apart from its frequency and quantity, approaches through additional indicators, including but not limited to, conflict timing, nature, source, and intensity.[1]

This research is structured around the following questions: (1) How can mining conflict in China be characterized, apart from frequency and quantity? (2) What are the relations between the different actors involved in illicit mining? (3) What factors complicate the enforcement of mining policies and laws in China? It needs mentioning that a large proportion of research on Chinese mining is directed towards environmental disputes, which pose a threat to the livelihood of local communities, such as through pollution, diseases, earthquakes, land subsidence, and forced displacement (Fan et al., 2003; Tang, 2016; Wang et al., 2011; Zhang, 2013).[2] Having said this, there is also significant conflict due to the economic stakes involved in mining, pitting central government against local government, governments against farmers, and farmers against farmers.

The vested economic interests in mining create ample incentives for rent-seeking (Zhan et al., 2015). In fact, the illegal operation of mines is often tacitly condoned or even actively shielded by local officials, called "protective umbrellas" (*baohusan* in Chinese), sometimes at the instigation of, or supported by village cadres. In fact, from the very establishment of mines, village collectives – as the *de jure* owners of rural land – play a crucial role in land acquisition, as a result of which the cadres that govern them are easily enticed into closing lucrative, yet, illicit deals. Simultaneously, while the majority of mining profits is distributed among the central/local state and mining companies, the share obtained by the general populace is limited (Wen, 2012; Xing, 2013).[3] This uneven wealth distribution is a frequent source of conflict (Hu and Tan, 2011; Wei, 2008; Zhan, 2013). Lastly, mining also divides rural communities internally; while some may benefit from higher incomes through mining, other groups may feel lost out (Wright, 2004). In the context of the above, this paper will zoom in on the economic conflicts over mining.

Apart from the introduction, this article is structured as follows. The following section starts by introducing the data sources, and continues to describe the mixed methods with particular reference to the Conflict Analysis Model and case-studies. For a better understanding of the character, dynamics, and features of mining conflicts, the third section presents the findings of the conflict analysis along a set of six different indicators. The fourth section makes a qualitative analysis of three typical case-studies on mining disputes. The article closes with a discussion of the empirical findings followed by a conclusion reviewing the study's ramifications for the understanding of resource conflicts in general, and mining conflicts in particular.

2. Data and methods

The conflicts that were analyzed for this study are derived from a set of cases investigated under the auspices of the newly established Ministry of Natural Resources (previously, the Ministry of Land Resources), the primary state organ responsible for mining in China. The set initially contained a total of 704 local cases, which were first textually analyzed, and then categorized, resulting in 344 government notices, 156 brief reports, and 204 extended cases sufficiently rich in content for further analysis. The cases, which come from all over China, cover the period from May 2011 to June 2016 and were collected by the Ministry as study and training material.[4] They give a relatively adequate and detailed inside representation of the economic conflicts over mining, which set government in opposition of society, and different levels of government in opposition of each other.

Below we will discuss the quantitative and qualitative approaches that have been employed for this study.

2.1. The conflict analysis model (CAM)

The CAM originated from the study of land tenure and forest conflict (Ho, 2005, 2006), and was gradually developed to include a set of seven variables (Ho, 2014), notably, timing, source, nature, frequency, intensity, duration, and outcome of conflict. This was later expanded with an additional indicator of the different actors involved in conflict (Yang and Ho, 2019). The model is a heuristic tool to which indicators can be added, adjusted, and operationalized according to the needs of the study. In effect, it is a flexible, analytical instrument to assess the variables at play rather than a rigid model in which each indicator needs to be present.

The aim of the CAM is to approach conflict in a multi-dimensional, temporally, and spatially sensitive manner by going through a reiterative process of hermeneutical data interpretation. To date, the CAM has been applied and tested through a variety of studies, such as on urban commons (Arvanitidis and Papagiannitsis, 2020), grassland (Fan et al., 2019), forest (Krul et al., 2020), indigenous land rights (Nor-Hisham and Ho, 2016), and arable land (You et al., 2022). Geographically speaking,

[1] Conflict intensity may be important to consider in the Chinese context, as political power is highly centralized, and certain mechanisms for conflict resolution available in other parts of the world, are less available or absent, which might cause different conflict intensities. For instance, disputants have fewer means to escalate conflicts to higher-level courts or institutions, causing conflict to be more localized. In effect, conflict resolution through referendum, establishing contacts with global non-governmental organizations or appeals to the International Court of Justice seldom occur (Haarstad and Fløysand, 2007; Paredes, 2016; Urkidi, 2010). In addition, due to lower legal awareness and less trust in the judiciary, conflict resolution frequently happens in the extra-legal sphere, such as through mediation and petitioning (in Chinese: *xinfang* or "letters and visits") (Huang, 2015).

[2] It should be noted, however, that the environmental impact of mining only becomes apparent at a long term, often years after mining has commenced. This implies that there is also a time-lag between the start of mining and the eventual eruption of conflict.

[3] In this regard, various studies ascertained a so-called "resource curse" in the mining areas, with a low per capita GDP growth rate, outdated industrial structure, and lagging public expenditures (Li et al., 2013; Zhan et al., 2015).

[4] For an easier understanding for readers less familiar with the Chinese context, the cases are not literally translated but are instead rendered as annotated and shortened transliterations with additional interpretation from the authors. As the cases total over 200, they could not be individually referenced in the bibliography due to limitations of space. Therefore, they have been referenced as (Ministry of Land Resources, 2011-2016), apart from the specific cases used for the qualitative analysis.

these studies encompass regions ranging from Southeast and East Asia to Southern Europe.

In this paper, the model will be used to analyze mining conflicts according to the following indicators :[5]

1) Location, described as the place where the conflict occurred, and operationalized via the region (North/South) and provincial-level unit (province, autonomous region, municipality under the State Council) where the conflict took place;[6]
2) The timing, described as the time when the conflict occurred, and operationalized here as the year and month when the conflict was made public;
3) The source, described as the origin or cause of the dispute, and operationalized through the type of violation that triggered the disagreement;
4) The nature, described as the kind of mineral resource, and operationalized through four sub-types (i.e. energy, water/gas, metallic minerals and non-metallic minerals);
5) The channel, described as the way in which the conflict has become known, and operationalized through the channel via which the case was initially reported (public tip-offs, inspections, media reports, and so forth);
6) The intensity, described as the gravity of the conflict, and here operationalized through the level of the imposed penalty.[7]

The indicators are scored according to the number of cases and frequencies, after which a heuristic, interpretative assessment establishes each indicator's relative weight vis-a`-vis the total. This process of conflict analysis can be visualized as depicted in Fig. 1.

2.2. The case-studies

Notably, each of the 204 cases is based on a narrative account, which goes into minute detail in describing a case. When analyzing the cases through the CAM, a substantive proportion of these empirical details is actually lost. In contrast, by making a careful selection of the cases, and analyzing them through a case-study approach (Yin, 2009), various important features of economic mining conflicts can be highlighted: (1) the involved actors, such as mine owners, overseers, miners, villagers, rural cadres, mining companies, reporters, and various levels of local government; (2) actors' inter-connecting networks, e.g. the relation between private/corporate mine owners vis-a`-vis villagers, rural cadres and local government; (3) the economics of rent-seeking, or more particularly, the costs and benefits of illegal mining.

For a better understanding of the case-studies, some additional background information on the levels of Chinese administration and on the distinction between state "officials" (*guanyuan*) and rural or village "cadres" (*ganbu*) can be insightful. For starters, the Chinese government is comprised of four different levels, ranging from: (1) central; (2) provincial; (3) prefectural; and (4) county, with the latter three also known as "local governments".[8] Beneath the county, Chinese administration is composed of three levels of the (rural) collective: (1) town/township; (2) administrative village; (3) natural village/villagers' group. The collective is generally known as a self-governing organization (*zizhi zuzhi*) in the sense that its incumbents are not on the government's payroll, but are supposedly self-financed. In this context, the difference between officials and cadres also becomes clear: the former term is reserved for people employed at various levels of government, whereas the latter generally refers to those employed by the (village and township) collective.

We here qualitatively analyze a typical albeit necessarily limited selection of the cases, due to reasons of space. The first one of these deals with the illegal reopening of an artisanal coal mine in Sichuan Province, which had been ordered by authorities to close down. The second case gives a fine-grained account of a local municipality's raid against a clandestine, artisanal mine of rare earths in Fujian Province. The third case deals with the illegal sub-lease of a mine exploited in excess of its license by a mining company in Guangdong Province. The cases are based on, respectively, (Department of Land Resources of Guangdong Province, 2013; Ministry of Land Resources, 2013; Sichuan Provincial Bureau of Land Resources, 2012). For a geographical distribution of the case-studies, see Plate 1.

3. Using CAM to analyze conflict

In this section we will commence the analysis with the quantitative analysis of mining disputes through the CAM, and more in particular, by looking at the conflict location, timing, source, channel, nature, and intensity. The findings around each of these indicators are respectively discussed below.

3.1. Location

China's mineral resources can be found in all provinces, autonomous regions, and municipalities under the State Council, which is largely reflected in the geographical occurrence of the cases (although not all provincial-level units are represented). As shown in Table 1, in terms of geographical distribution, over two-thirds of the cases (68.1 percent) come from southern China, with the provinces of Guangdong, Sichuan and Hunan ranking among the top three. The remainder of the cases (31.9 percent) comes from northern China, with Henan, Hebei and Shandong ranking among the highest.

3.2. Timing

With regard to the timing, Table 2 shows that more than half of the cases date from the second half of 2012, while there is a marked decrease of cases after that.

3.3. Source

In terms of the source or cause of conflict that sets central against local government, and governments against society (i.e. corporate actors and farmers), Table 3 establishes that well over half of the cases (54.9 percent) stem from unlicensed or illegal mining.

The second source of economic conflicts (yet, at considerable

[5] Thus, in certain ways the CAM used here deviates from earlier applications (most specifically through the addition of geographical location), while it concurs with earlier research through the inclusion of timing, nature, source, and intensity.

[6] In China there are currently four provincial level cities under the State Council, i.e. Beijing, Tianjin, Shanghai and Chongqing.

[7] Again, CAM is a flexible, heuristic tool, and intensity can also be measured in other ways, such as the level of escalation (e.g. township, county, prefecture, province, national) and the type of escalation (e.g. mediation, petitioning, lawsuit, protest, road-blocks, violence) (Yang and Ho, 2019).

[8] In the original Chinese case descriptions, the prefectures have been termed "prefectural level cities" (*dijishi*) or county-level cities (*xianjishi*), which are Chinese terms to distinguish these administrative levels from their rural counterparts, the prefecture and county, respectively. However, to simplify the cases, they have here been rendered as prefecture and county. The distinction between urban and rural administrations, is also the reason for the difference in China between the "town" (or *zhen*; urban) versus the "township" (*xiang*; rural).

Fig. 1. Conflict analysis model (CAM) applied to mining conflicts. Source: Illustrated by authors.

Table 1
Geographical location of the cases.

Region	Cases	Percentage	Provincial unit	Cases	Percentage
South China	139	68.1	Guangdong	37	18.1
			Sichuan	23	11.3
			Hunan	21	10.3
			Guangxi	18	8.8
			Zhejiang	12	5.9
			Fujian	11	5.4
			Hubei	6	2.9
			Jiangxi	5	2.5
			Anhui	3	1.5
			Jiangsu	1	0.5
North China	65	31.9	Henan	12	5.9
			Hebei	9	4.4
			Shandong	8	3.9
			Shanxi	6	2.9
			Inner Mongolia	6	2.9
			Liaoning	5	2.5
			Beijing	3	1.5
			Heilongjiang	3	1.5
			Ningxia	3	1.5
			Xinjiang	3	1.5
			Jilin	2	1.0
			Tianjin	1	0.5
			Qinghai	1	0.5
Unknown	5	2.5	Unknown	5	2.5
Total	204	100.0	Total	204	100.0

Source: Illustrated based on (Ministry of Land Resources, 2011–2016).

Table 2
Timing of conflict.

Year / month	Cases	Percentage
201,204–201,206	33	17.7
201,207–201,212	101	54.3
201,301–201,306	31	16.7
201,307–201,312	16	8.6
201,401–201,406	5	2.7
Total	186	100.0

Source: Illustrated based on (Ministry of Land Resources, 2011–2016).

distance from the primary cause) is constituted when the mine operates outside of the designated plot boundaries (16.7 percent). In this case, the mining entity attempts to maximize profits by clandestinely mining in excess of that what has been originally approved by the government. The qualitative analysis in the next part of the paper presents a poignant example of that (Case III: Illicit sub-lease by a wollastonite mining company). The third most important cause of conflict comprises the wider category of other types of offenses (9.8 percent). This category refers to: illegal lease and transfer of mining rights; illegal extraction, processing and storage; illegal purchase and sale of minerals; forgery of documents; disputes over compensation; illegal transportation; illegal change of mining methods; concealment of mining accidents; and lastly, bribery and officials acting as "protective umbrellas". The qualitative analysis provides an insightful example of this (Case I: Illegal reopening of an artisanal coal mine).

Table 3
Source of mining dispute.

Type of violation	Cases	Percentage
Unlicensed / illegal mining	112	54.9
Mining beyond designated borders	34	16.7
Other	20	9.8
Illegal use of land*	16	7.8
Exploration as excuse for mining**	6	2.9
Unknown	16	7.8
Total	204	100.0

* Illegal use land use refers to the occupation of land resources other than agricultural land (included in the category on unlicensed/illegal mining), such as forest, grassland and wasteland. ** According to the 2009 Mineral Resources Law separate permits need to be obtained for mining exploration and exploitation. However, mining companies oftentimes start mining after just having received the green light for the exploration (and not exploitation) of minerals.
Source: Illustrated based on (Ministry of Land Resources, 2011–2016).

3.4. Channel

With regard to the channel or way in which the conflict has become known, Table 4 ascertains that the three highest scoring channels are:

1) Regular inspection (*xuncha*; 18.1 percent), which refers to the daily supervision on mining to identify current statuses, trends, and potential problems as to timely prevent transgressions and take measures;
2) Public tip-offs by individuals (*qunzhong jubao*; 17.6 percent), which can take place through the designated hotlines (12336 Ministry of Natural Resources Hotline), Wechat (by scanning the governmental QR code), or online (by submitting digital complaint forms);
3) On-site inspection (*jiancha/shencha*; 10.8 percent), meaning the examination, verification, and investigation of suspected sites, articles,

Table 4
Channel of conflict.

Way in which conflict became known	Cases	Percentage	Valid percentage
Inspection	37	18.1	30.3
Public tip-offs	36	17.6	29.5
On-site inspection	22	10.8	18.0
Special operations*	15	7.4	12.3
Joint law enforcement**	8	3.9	6.6
Others (accidents, media reports, etc.)	4	2.0	3.3
Unknown	82	40.2	N.A.
Total	204	100.0	100.0

* Refers to specifically targeted campaigns on issues of high importance.
** Relates to inspection campaigns jointly carried out with other relevant departments, such as on environmental protection, commerce, or agriculture.
Source: Illustrated based on (Ministry of Land Resources, 2011–2016).

tools and accounts after an administrative case is filed. On-site inspection provides legal evidence for investigating and punishing illegal acts, and its procedure is bound by the Administrative Penalty Law.

Notably, in a significant number of cases it is unknown how the case was brought to the attention of the competent department of Natural Resources. For this purpose, Table 4 also provides a row with the recalculated (valid) percentages by excluding the unknown values.

3.5. Nature

With regard to the nature of the conflict (Table 5), it can be seen that approximately one-third of the cases concern metallic mineral resources (such as gold, silver, tin, copper, zinc, iron, and aluminum), whereas another one-third is relates to non-metallic minerals (including sand, gravel, limestone, gypsum, clay, and marble). Energy resources (e.g. coal, oil, and natural gas) account for 15.7 percent.

3.6. Intensity

When considering the intensity of conflict (Table 6), it can be seen that in the overall majority of cases, it is unknown whether, and if so, what fine has been imposed. If we exclude that proportion, it can be ascertained that in terms of the valid percentages, close to 40 percent of the cases are only lightly fined, with a proportion of less than 10 percent of the illegal revenues. Fines against a proportion of over 50 percent of illegal revenues account for 20.9 percent.

4. A qualitative assessment of mining cases

After having provided the reader with a quantitative assessment of mining conflict through the CAM, this section will continue with a qualitative assessment of the cases. Different from the CAM analysis, the qualitative, case-study analysis can reveal various features which the preceding analysis could not, and is thus, complementary to the CAM in terms of: (1) the involved actors; (2) the networks that tie the actors together; and 3) the economics of rent-seeking, or the various costs and benefits in the illegal operation of mines.

4.1. Case I: illegal reopening of an artisanal coal mine[9]

In rural China many coal mines have been opened up by farmers. However, due to their small scale and artisanal manner of operation, miners generally face dangerous working conditions leading to frequent mining accidents (He and Song, 2012). Since 2010, the Chinese State Council has launched a Combat against Illegal Activities (*dafei zhiwei*) which aims to strengthen work safety. In its wake, many artisanal mines have been ordered to close down. The following case demonstrates that the enforcement of this policy has also encountered challenges.

Table 5
Nature of conflict.

Resource	Cases	Percentage
Metallic resources*	65	31.9
Non-metallic resources	63	30.9
Energy**	32	15.7
Water / gas***	1	0.5
Unknown	43	21.1
Total	204	100.0

* Includes rare earth metals, such as neodymium, cerium, and yttrium. ** Refers to coal, oil, shale gas/oil, natural gas, uranium and geothermal resources. *** Includes groundwater, mineral water, carbon dioxide, hydrogen sulfide, helium and radon. Source: Illustrated based on (Ministry of Land Resources, 2011–2016).

Table 6
Intensity of conflict.

Fine as proportion of illegal revenues	Cases	Percentage	Valid percentage
<10%	17	8.3	39.6
10% - 30%	13	6.4	30.2
>50%	9	4.4	20.9
30% - 50%	4	2.0	9.3
Unknown	161	78.9	N.A.
Total	204	100.0	100.0

Source: Illustrated based on (Ministry of Land Resources, 2011–2016).

Located on the side of a hill behind the former Huashan Cement Plant in the Western District of Panzhihua City, is an old, illegal coal mine. It had been formerly operated and "owned" by Qin Yehui, but had been ordered to close down.[10] In November 2007, Min Guiping and Huang Wanli conspired to lease the mine from Qin, and illegally reopened it. For the lease fee, Huang agreed to pay Qin 200 Renminbi (RMB) for each farm truck loaded with mined raw coal.[11]

Min and Huang recruited Zhang Chuan, a rural cadre working in the Coal Anti-Smuggling Team (*meitan dasidui*) at Taiping Township, Renhe District. He was promised 2,000–3,000 RMB a month, in return for which he acted as a "protective umbrella" for the clandestine mine. Huang hired Zhang Hong and Li Guangkun as overseers to recruit miners for which they would receive 2,000 RMB per farm truck of coal. Under this arrangement, Zhang and Li themselves had to pay the workers' wages and production materials. They paid the miners 4.5 RMB for each woven bag of raw coal, and 5.5 RMB for each bag loaded unto the farm trucks (rented by Min and Huang) (see Fig. 2).

Zhang and Li hired the workers Liu, Tang, and others to mine the coal. During the period of illegal mining, Qin Yehui's wife, Xiong Min, went to the mine daily to count the number of trucks and calculate the lease fees. In total, she collected over 15,000 RMB. From December 2007 to February 2008, Min, Huang, Zhang, Li, Xiong and others illegally mined more than 80 vehicles of raw coal, totaling over 500 tons, with an estimated value of 153,500 RMB. During the period, the initial conspirators, Min and Huang, respectively received 10,000 RMB and 4,000 RMB. Overseers Zhang and Li respectively earned 8,500 RMB and 8,000 RMB.

At the same time, Wang Huixiang, who had set up a coal washing plant in the north of the Baoding Bridge,[12] persuaded Huang to sell the coal to him, which he eventually acquired against a price of 400 RMB per ton. In total, he purchased over 400 tons of raw coal against 160,000 RMB. On the morning of 4 February 2008, a mining accident occurred in which worker Tang was injured, and the mining was stopped.

On 7 April 2008, the overseers Zhang Hong and Li Guangkun were detained on charges of illegal mining by the Public Security Bureau [i.e. the police] of Panzhihua Western District.[13] The same month, on 23 March, the competent Bureau of Public Security applied for an appraisal of the economic damages, which was issued by the Sichuan Provincial

[9] The case also provided gender and ages of all actors, but for reasons of space this information has been omitted. In sum, all actors are male except for Xiong Min, while most of the actors are in their 30s, except for Li Guangkun (Sichuan Provincial Bureau of Land Resources, 2012).

[10] According to Chinese law, mineral resources are owned by the state, while its use may be leased by third parties. In spite of this, farmers often claim ownership of the mines that they have opened up and exploit themselves.

[11] At the time one RMB was roughly equal to 0.13 US dollar.

[12] This bridge crosses the Jinsha River in Panzhihua City, and forms the main channel between the Baoding coal mining area and the outside world.

[13] Remarkably, Huang and Min were released on 30 April 2008, after which they continued the illegal mining. Subsequently, the Panzhihua Western District Bureau of Land Resources filed a case on 2 March 2009, and reported it to public security three days later.

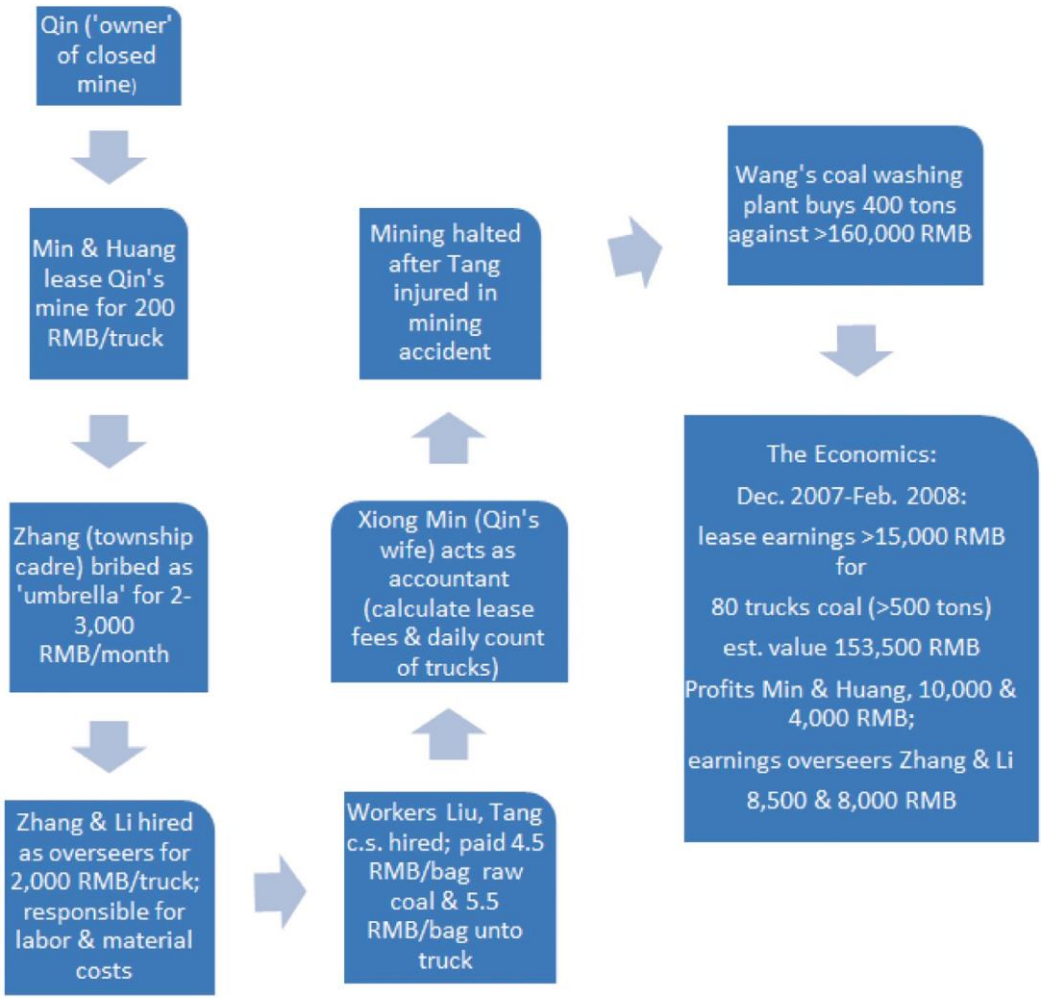

Fig. 2. Actors, relations and economics in illegal mining. Source: Illustrated by authors.

Department of Land Resources on April 7. The following day, public security executed the arrest, while public prosecution was filed by the Western District People's Procuratorate on 24 June. On 7 July, Min, Huang, Zhang, Li and Xiong were sentenced by the Western District People's Court to fixed-term imprisonments ranging from six months to one year and ten months, and fines between 2,000 RMB to 4,000 RMB. The owner of the coal washing plant was sentenced to fixed-term imprisonment of ten months and fined 4,000 RMB. All perpetrators were sentenced to compensate the Panzhihua Coal Company for economic losses of 123,000 RMB. Zhang Chuan, the township cadre who had acted as a "protective umbrella", was separately dealt with.[14]

4.2. Case II: raid against artisanal, rare earths' mine

This case is told through the eyes of a reporter who was allowed to join a government raid against an illegal mine. As a result, we have an extra-ordinary fine-grained account of the manner in which such a raid is executed, and of the persons who are involved, and equally important, who are not, to safeguard the integrity of the operation.

On 11 December Wang Qinyong, deputy leader of the Inspection Team of Land Resources of Longyan Prefecture, received a public tip-off that someone had bribed local villagers to illegally exploit rare earth metals in a village named Changkeng situated in Gutian Town, Liancheng County. Wang immediately reported this to relevant leaders.

On the morning of the 12th, Wang Qinyong called me to inform of a joint operation at 3 a.m. the next morning together with the Department of Public Security and the Forest Public Security of the same city. The same day at 11.00 p.m. Wang took two law enforcement officers to explore the site. To prevent leakage, all law enforcement officers involved in the operation were left unaware of the location, neither was the local (County) Bureau of Land Resources informed, nor was local public security personnel asked to participate.[15]

At 3:30 a.m. on the 13th, law enforcement officers participating in the operation arrived at the rendezvous one after another. As the commander-in-charge of Longyan Prefecture's Joint Special Action against illegal mining of rare earths, Wang Qinyong briefly explained the plan and matters of attention. After that, 19 law enforcement officers drove five cars to the destination.

After driving along national highway 319 for some distance, the car entered the expressway at Longyan West. Wang Qinyong related that on 11 December he received a public tip-off that someone had bribed local villagers to illegally exploit rare earth. Wang immediately reported this to relevant leaders and took two law enforcement officers to explore the site at 11 p.m. of the 12th (see Fig. 3).

[14] As Zhang was a local cadre his case was likely transferred to the local Party Commission for Discipline and Inspection.

[15] The text mentions that the participating units were of "the same city" (*tongshi*) which should refer to Longyan, while it mentions "local" (*dangdi*) which likely refers to the county level administration under their jurisdiction. No year in which the case occurred is mentioned.

After the car arrived at 5:40 a.m., the law enforcement officers were split up in two groups, one group went straight to the entrance of the quarry to seize illegally mined rare earths; the other group went on-site to apprehend workers and collect relevant evidence materials. Due to the continuous rain a few days ago, the path had turned muddy, which impeded walking, while we had to use hands and feet to carefully crawl past certain steep sections.

When arriving at the temporary residence of the workers, we saw nine sheds lined up along the foot of the mountain. When hearing the sound of footsteps, the workers woke up. Seeing the officials at the door, some panicked and rushed to the mountains in their pajamas and disappeared in the fog. A total of nine workers were apprehended.

At 7:20 a.m. dawn had broken and the mine could be better inspected. It was well hidden in the mountains. At the foot of the mountain, we found a high-power diesel generator, and four steel barrels filled with diesel, surrounded by wires and plastic pipes. Further on, almost half of the mountainside had been blown open, leaving the bare mountain conspicuously exposed. Illegal miners had dug away the surface of the mountain, transported and piled up the soil, which was then injected with solution. By adding oxalic acid to the exuded liquid, the rare earth metals could be obtained.

This is the simplest and most primitive method of rare earth mining. The result, however, is the destruction of vegetation, soil erosion, water pollution, and loss of farmland. Reportedly, every ton of rare earth mined in this way destroys 200 m^2s of vegetation, strips 300 m^2s of topsoil, and results in 2,000 m^3 of tailings and 12 million cubic meters of soil erosion per year.

A villager passing by related that after mineral processing, the wastewater contained extremely high concentrations of ammonium oxalate and ammonium sulfate, and directly flowed from the mountain streams and gullies into the farmland, fish ponds, and rivers at the foot of the mountain. As a result, farmland could no longer be cultivated while fish died. Even if fish were caught alive, nobody would dare to eat.

Halfway up the mountain, we could only see a few plastic pipes conveying the ore liquid from the top of the mountain to two basins used to leach the rare earth. The basins contained a light green liquid, while adjacent to them was a large number of discarded plastic bags that had contained ammonium sulfate and ammonium oxalate. The bags, when piled up high enough, were directly burned in situ. To get a sense of the magnitude of this operation, in a shed in the village, law enforcement officers discovered over 30 tons of unused ammonium sulfate and (toxic) ammonium oxalate used for the leaching of rare earth metals.

At 8:20 a.m. the special action team transferred the nine workers, relevant evidence, and the discovered chemicals to the Liancheng County Public Security Bureau and the Bureau of Land Resources for investigation. Simultaneously, both agencies were ordered to dismantle the production facilities and living quarters of the mine, and apprehend and investigate those who had fled the site.

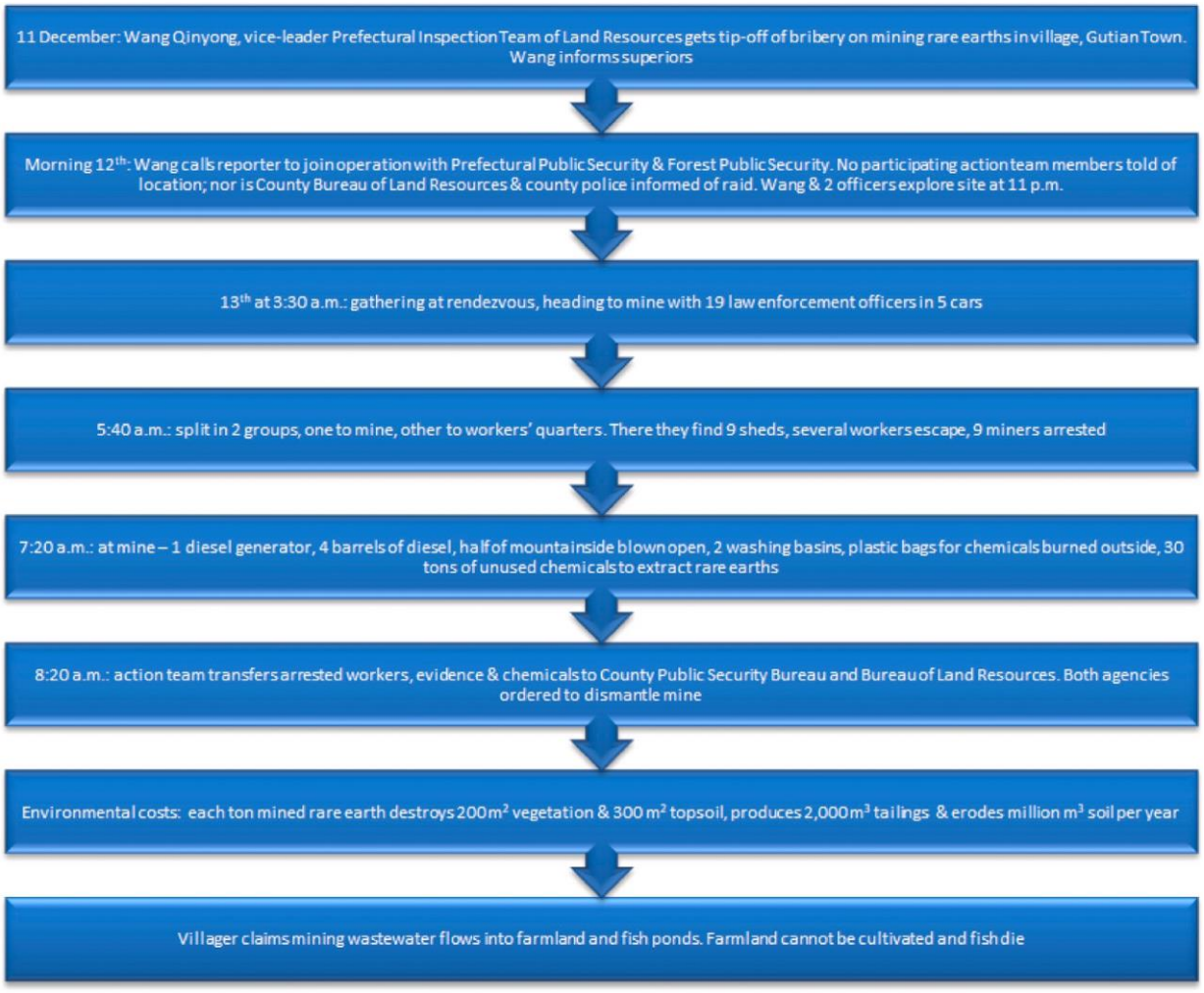

Fig. 3. Actors, relations and environmental costs of rare earths' mine. Source: Illustrated by authors.

4.3. Case III: illicit sub-lease by a wollastonite mining company

Different from the preceding cases, which concern artisanal mines, this case involves a company that has legally obtained a mining license for the exploitation of wollastonite (of which China is the world's leading producer).[16] What makes the case interesting is the way in which government policy on mining production is being evaded by actors on the ground.

In October 2005, the Lingnan Company obtained a license for the mining of wollastonite near a village in the Shizitou Mountains at Dalubian Town, Lianzhou City. The license had validity until December 2009. However, during the term the company did not develop and use the wollastonite according to the spatial planning, and its production scale evidently exceeded the scope of the license.

After the license expired, Lingnan Company leased the part of the mine that was illegally exploited in excess of the license to Huang Jinliang and Zhong Xingfu for a period of six years at an annual lease fee of 800,000 RMB. Huang and Zhong illegally exploited this mine from May 2010 until March 2012. Following a public tip-off, the Provincial Department of Land Resources, together with the competent departments of Qingyuan Prefecture (under which jurisdiction the county-level city of Lianzhou falls), investigated the case (see Fig. 4).

According to the Appraisal Committee of the Provincial Department of Land Resources, the illegal (and destructive) exploitation of wollastonite ore by the Lingnan Company amounted to 122,000 tons over a period from 2007 until 2009. This resulted in economic damages to the government of 7,321,000 RMB. The clandestine mining by Huang and Zhong during 23 months resulted in economic damages of 7,066,400 million RMB.

The Qingyuan Prefectural Department of Land Resources imposed the following administrative penalties: the (current) mining license of the Lingnan Company was revoked, and a fine of 2,194,600 RMB was imposed according to 30 percent of the economic damage. In addition, the revenues of 800,000 RMB from the lease to Huang and Zhong were confiscated, while a fine of 50 percent of these proceeds was imposed amounting to 400,000 RMB. Huang and Zhong were penalized as follows: their revenues of 7,066,400 RMB through the illegal mining were confiscated, and while awaiting prosecution, one of them was already detained.[17]

The Qingyuan Prefectural Party Commission for Discipline and Inspection, and the Prefectural Government Bureau of Supervision put forward the following recommendations regarding the liability of involved government officials :[18] the Vice Mayor of Lianzhou Municipality and Mayor of Dalubian Town were both stripped of their party positions. Both were charged with acting as "protective umbrellas" during their term, and were further prosecuted by the Qingyuan Prefectural People's Procuratorate. The Deputy Director of the Municipal Administration of Work Safety received a "grave administrative demerit" (*xingzhengjidaguo*). Those receiving a lighter punishment of "administrative demerit" (*xingzhengjiguo*) included the Deputy Director of the Bureau of Land Resources and Deputy Director of the Bureau of Forestry of Lianzhou Municipality, as well as the Deputy Mayor and Head of the Public Security Bureau of Dalubian Town.

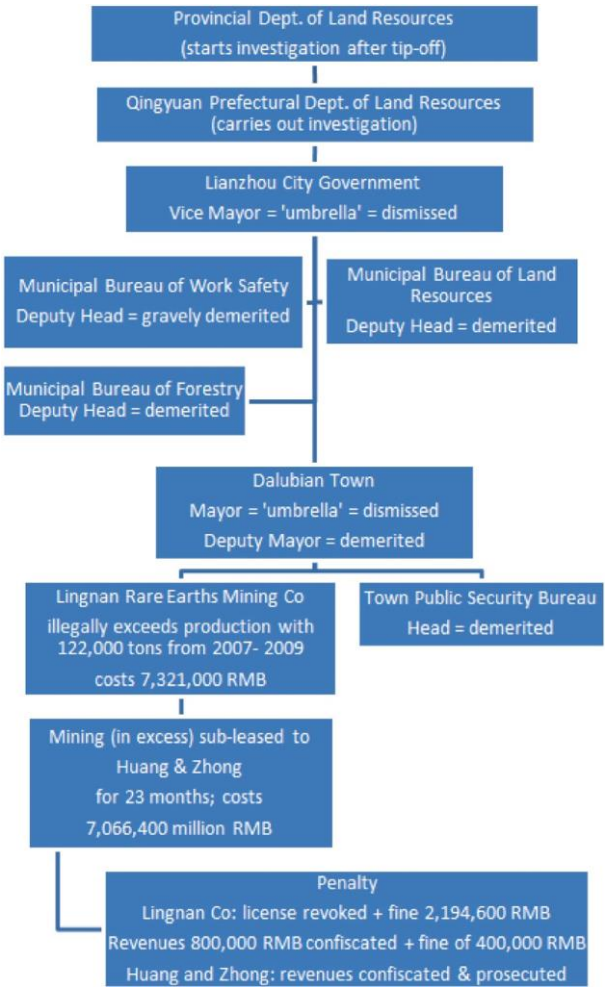

Fig. 4. Actors, relations and economics in illegal sub-lease of mine. Source: Illustrated by authors.

5. Discussion

5.1. Lessons from the CAM study

Let us turn to what can be learnt from the combination of the CAM and case-study analyses. The CAM analysis made an assessment of mining disputes on the basis of a set of various indicators: location, timing, source, nature, channel and intensity of conflict. Interestingly, it was found that the overall majority of the cases (or 68.1 percent to be precise) comes from South China. This may be explained from the fact that the economic stakes in the developed, wealthier regions of the south are generally higher, whereas the authorities' capacity and resources for law enforcement are better, potentially leading to a greater number of cases to be filed and investigated.

With regard to the time of occurrence of mining conflict, there is a marked decrease of cases after 2012. A possible explanation for this

[16] Wollastonite is a mineral with a wide variety of applications due to its flexural strength, durability, and resistance to chemical attack, high temperatures and friction. It finds use across many different industries, ranging for the production of ceramics, cement and insulating boards to paint, plastics and metals.

[17] The case also mentions Cheng Mingjian, Cheng Jianwei and Ouyang Zibin as suspects but does not specify their relation to Huang and Zhong. They could be hired overseers or workers.

[18] For reasons of space, the names of the officials have been omitted. In the original case (Ministry of Land Resources, 2013) the implicated officials are: Luo Mensheng, former Vice Mayor Lianzhou Municipality and incumbent Deputy Secretary Lianzhou Municipal Party Committee), Huang Zanhong, former Mayor of Dalubian Town and incumbent Party Secretary Town Committee; Huang Jianbo (Deputy Director Municipal Administration of Work Safety); Li Wanquan (Deputy Director Municipal Bureau of Land Resources), Li Tuqing (Deputy Mayor of Dalubian Town), Huang Xuri (Head Public Security Bureau of Dalubian Town), and Xu Mumin (Deputy Director Municipal Bureau of Forestry). Note that the Chinese state system consists of a parallel structure with an official heading the government and a party cadre heading the Party at a given level of administration. For instance, a city would have a mayor as well as a municipal Party Secretary. Although the Party Secretary generally has the final say (more particularly over human resources), the two positions do constitute a certain balance of power, and at times, also clash.

Plate 1. Case-study sites in China. Source: Illustrated by authors

might be the State Council's "Combat against Illegal Activities", which has led to an increased crackdown on illegal mining and the closure of artisanal mines. Moreover, due to China's pledge to become carbon-neutral by 2060, coal mines have been forced to restructure towards becoming cleaner, higher tech, and more efficient. In this context, the Chinese government expected the coal sector to lay off 1.3 million workers over the period from 2016 to 2020 (Ministry of Human Resources and Social Security, 2016). This has imposed even greater pressure on shuttering small-scale, informally operated mines.[19]

Concerning the source of mining conflict, we found that more than half of the cases have an origin in unlicensed mining. According to Chinese law, mining rights must be granted by the county government (or above, depending on the scale of the operation), and only after the land in question has been formally appropriated against payment of required taxes and compensation for farmers' relocation (Yang et al., 2017: 411). However, as village collectives are the *de jure* owners of rural land (although not of the mineral resources underneath, which are public property) (Ho, 2017: 214), they wield considerable discretionary power over the land in their jurisdiction. In effect, through bribery, the village collectives can illegally grant corporate and individual entities the right to mine, while surpassing the county (or higher levels of government) (as happened in Case II).

In terms of the channel, nature and intensity of mining conflict, the following observations can be made:

- In bringing cases to the attention of authorities, a relatively high proportion is brought in through regular inspections and an almost equal percentage through public tip-offs. The latter is interesting, and points to the potentially high level of discontent and grievances from other actors affected by the mining;
- The CAM revealed that energy resource conflicts only account for 15.7 percent of the cases, whereas counterintuitively, one would have expected a higher percentage given the fact that China is the world's largest producer of coal, and accounts for a high number of coal mining accidents (see: Case I in which operations were halted after a mining accident);
- When considering the intensity of conflict, only a small percentage (4.4 percent) has a severe fine of over 50 percent of the illegal proceeds, while 8.3 percent is fined less than 10 percent. Having said that, in the majority of the cases (78.9 percent) the height of the fine is unknown. The relatively large number of missing cases is also an

[19] Note, however, that this explanation is conjectural, and the cases here cannot be interpreted in a similar way as a statistically representative survey. Moreover, there is also a time lag, as the campaign started two years earlier in 2010, while the decrease in cases occurred in 2012.

issue in the cases of conflict channel and nature, and care should be taken to interpret these figures.

5.2. Lessons from the case-studies

Different from, yet, simultaneously complementary to the CAM, the qualitative analysis of the case-studies has, in various ways, demonstrated: (1) what actors are involved in the mining conflicts; (2) how they relate to each other, as well as; (3) the rent-seeking economics that drive the cases (see: Table 7).[20]

5.2.1. Actors

What becomes clear from Table 7 is that economic mining conflicts are not a straightforward matter of government pitted against society, but are comprised of multi-layered networks. These networks can start from as high as the provincial government (where a conflict may start, e. g. through a public tip-off), pass through the prefecture, county, and township, and go right down to the level of individual villagers. We also see a highly varied range of involved actors, including different government departments (charged with land administration, inspection, public security, forestry, and work safety; see Cases II and III); representatives from the media (reporter asked to join a raid; Case II); companies (legal and illegal entities; mining and processing firms; Cases I-III), and individual farmers whose interests mutually conflict (driven by grievances over pollution; Case II) or concur (while jointly operating the illicit mine; Case I).

5.2.2. Relations

The case-studies reveal how the different actors relate to each other, and mobilize networks to engage in illegal mining and evade the policies that aim to regulate, license, or crack down on artisanal mines. For instance, Case I shows how individual actors organize themselves to engage in illegal mining (owner of closed mine acting as its lessor; villagers becoming mine lessees and operating the mine; overseers who hire workers and supervise the actual work; owner of a coal washing plant who persuades mine operators to sell him illegally mined, thus, cheaper coal). Simultaneously, the case discloses the rent-seeking mechanism to win over local cadres to act as a "protective umbrella" by bribing a member of a coal anti-smuggling team at the level that directly oversees the village (i.e. the township). In this sense, the case exposes certain weaknesses in the policy implementation at the grassroots. Similar relations as described above are demonstrated through the Cases II and III (Table 1).

5.2.3. Economics

Case I on the reopening of a mine provides detailed information on the economics of illegal mining (i.e. lease fees, prices per bag and truck load of raw coal, total coal production, coal washing costs, gross income, and profits per person). Although Case II on the raid against a rare earths' mine does not reveal exact figures, it does provide clues as to the extent of rent-seeking: the precautions taken by the raiding team to avoid blowing cover, i.e. the speed of action (less than 48 h after the tip-off), the secrecy (team members withheld the location, lower-level administrations not informed), and the scale of operation (3 departments, 19 officials, and 5 vehicles). Through the case we also get good insight into the environmental damages of artisanal mining (large quantities of untreated wastewater, open-air burning of plastic, pollution of arable land and fisheries, destruction of soil and vegetation). In this case, it is likely that the adverse environmental impacts have driven the public tip-off (think of the negative comments by the villager). Case III on the illegal sub-lease by a mining company shows the government-incurred costs of a high-level case (directly overseen by provincial authorities): the economic damages caused by the company are specified in time (2007–2009), quantity (122,000 tons), and monetary terms (7,321,000 RMB), while those caused by the villagers is specified in time (23 months) and monetary terms (7,066,400 million RMB). We also get direct information on the extent of rent-seeking, i.e. the number of implicated persons (seven officials), their ranks (county vice-mayor; town mayor; county department heads; and town police head), and the level of penalties (dismissal, demerits, fines, confiscations, and revocations).

Table 7
Qualitative Mining Case-studies: Actors, relations, and economics.

	Case I	Case II	Case III
Actors	1) owner (closed mine); 2) villagers; 3) accountant; 4) rural cadre; 5) overseers; 6) miners; 7) coal washing plant owner	1) prefectural inspection team head & members; 2) reporter; 3) county land resources bureau; 4) county public security; 5) miners; 6) villagers	1) provincial & prefectural land resources bureau; 2) city government; 3) city bureaus for work safety, forestry, land resources; 4) town government; 5) town public security; 6) mining company; 7) villagers
Relations	Case revealed after accident. Villagers lease from former mine owner, bribe cadre and hire overseers, who in turn hire miners; villagers approached by coal washing plant owner (not vice versa)	Case revealed via tip-off. Mine owner bribes village (cadres), but exposed by villager, prefecture raids mine, and suspects rent-seeking at prefecture/county (within own ranks, departments of public security & forest police)	Case revealed via tip-off. Company leases excess mining to villagers; officials at various levels bribed/involved, i.e. city vice-mayor, 3 heads of city departments; town mayor/vice-mayor; town public security head
Economics	Total earnings of lessor/lessees, overseers; workers' salaries; bribery expenses; costs illegal coal washing	No info on earnings, but on extent of rent-seeking and environmental costs, i.e. soil erosion, destroyed vegetation, pollution, loss of farmland & fishery production	Total earnings of lessor/lessees over time; rent-seeking involves 6 officials at city/township levels

Source: Illustrated by authors.

6. Conclusion

It would be almost a platitude to state that mining has led to serious conflict around the world; to be sure, there are numerous studies into mining-induced conflict from as equally numerous parts of the world (Atta-Quayson and Baidoo, 2020; Haslam and Tanimoune, 2016; Owen and Kemp, 2015; Paredes, 2016; Yang et al., 2017). A significant proportion of the research on mining conflict is devoted to the question whether the relative abundance of mineral resources is to blame: countries well-endowed with minerals face a "resource curse" (Collier and Hoeffler, 2005).[21] Significant research is also devoted to examining procedures to prevent or mitigate conflict, such as through responsible

[20] The company secretly sub-leased its excess operation to villagers after its initial license had expired. This allowed it to gain revenues from the illegal mine, while staying clear from operating it. An indication for this is that the villagers sub-leased the mine after the license's expiration. Paradoxically, the company's license was revoked as a penalty, which would not make sense if it had not been extended after its initial expiration. This leads to the suspicion that the company had to halt its excess operation after 2009, obtained a new license to continue the originally approved operation, but illegally sub-leased the excess operation.

[21] This hypothesis has been contended by others (Bond, 2014).

mining (Goodland, 2012), free, prior and informed consent (FPIC) (FAO, 2016), and social impact assessment (SIA) (Becker, 2001).[22]

However, before considering how mining conflict can or ought to be mitigated, managed, or prevented, we are actually in need of a multi-dimensional understanding of conflict rooted in the complexity of different societies, economies and polities. In effect, our understanding of mining conflict apart from considering the quantity and frequency of conflict could benefit from a more comprehensive approach based on the combination of different methods and indicators. To substantiate the argument, we focused on economic mining conflicts in one of the world's largest mineral producers, China. We then combined the qualitative analysis of Chinese case-studies on mining conflict with the use of the Conflict Analysis Model or CAM. Based on this double analysis, we are now in a position to return to our original research questions posed in the introduction.

Firstly, the CAM analysis has ascertained that apart from frequency, conflict can be effectively assessed in terms of where (location) and when it occurred (timing); what caused it (source); what mineral resource it involved (nature), how it became known (channel); and what level of seriousness it concerned (intensity). Secondly, through the qualitative case-study analysis, we have gained good insight into the number and types of actors involved in illicit mining, the relations that bind them, as well as the costs and benefits that drive them. Lastly, what complicates China's enforcement of mining policies is the fact that economic disputes are no straightforward matter of state versus society, but are propelled by complex, multi-layered networks between government, companies and farmers, causing different levels of government and society to be turned against each other.

The relational complexity of these cases signals that care should be taken in the interpretation of the statistics over mining conflict. In effect, mere numbers are insufficient to have a good sense of the kind of conflict that authorities are facing. It is hoped that this article has made a first step towards such a wider understanding of mining conflict, by marrying qualitative, in-depth case-study analysis with an improved, numerical measurement through the CAM.

Declaration of Competing Interest

The authors declare no conflicts of interest.

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