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Effect of Local Community's Environmental Perception on Trust in a Mining Company: A Case Study in Mongolia

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Abstract: While the mining industry is booming globally, local communities resist mining operations. It is crucial for mining companies to maintain trust within these communities to prevent conflicts. This research investigated local community's trust in a mining company in Mongolia using a questionnaire survey. We assessed the residents' perceptions of the company's effort to maintain environmental protection, as a determinant of trust, in addition to the determinants of motivation and ability. The results showed that the trust level varied within the different respondent groups and the determinants of trust differentially explained the state of trust. The nomadic herders who lived close to the mine site had low trust while being sensitive to the environmental effects. Other herders had neutral trust. Town citizens had high trust, which was mainly related to positive perceptions of motivation. Communicability of the information provided by the company influenced formulation of positive and negative perceptions. Overall, low trust likely leads to conflicts. Therefore, mining companies are advised to conduct surveys with different groups in the local community, especially those sensitive to environmental changes, and take measures to maintain trust.

Keywords: trust; mineral extraction; environmental perception; local community; herders; Mongolia

1. Introduction

Due to the expansion of mineral extraction worldwide, mining conflicts between mining companies and local communities have been increasing. While fewer than 50 conflicts were recorded annually up to year 2000, the numbers have steadily risen to 250 conflicts in 2016 [1,2]. The main reasons for mining conflicts are the perceptions of mining's adverse effects on natural environment and local communities' lives in terms of the sources of livelihoods, stocks of resources, and inherent traditional lifestyle [3]. For example, mining effect on water quality and quantity caused a conflict in Peru [4]. Local people resisted mining in Mongolia due to water contamination and land alteration [5–7]. In Andean highlands of Peru, local residents competed for land and water [1]. In these remote areas, livelihood is dependent on farming or livestock agriculture.

Various studies have been conducted on diverse aspects of mining conflicts to prevent confrontations and ensure sustainable mining development and satisfaction of local people. Consequently, the studies agreed on a generic content that distrust of local community is one of the factors that influences mining resistances [1,8]. Thus, mining companies need to gain trust of local community to prevent conflicts. Studying the state of trust prior to a problem would help us maintain the trust in the future [9]. Mineral extractions can have various effects on the natural environment, for example, leading to landscape change and increasing other risks associated with handling and

accommodating toxic chemicals. Nevertheless, mining companies can gain local communities' support through trust if they minimize any negative environmental effects and risks and address the concerns that cause distrust. We investigated the local community's trust in a mining company in Mongolia after a decade-long relationship without resistance.

The mining sector is the primary industry in Mongolia, with 16.1 percent of GDP and 78.8 percent of export income in 2015 [10]. The mining companies operate in the grassland areas where nomadic herders produce meat and dairy products by raising livestock, which is the main source of food in the country [11]. In addition, nomadic pastoralism is a traditional culture that depends on the use of grassland pasture and natural drinking water [12,13]. In this respect, livestock herding is the second most important economic unit, following the mining sector. These two industries need to sustain and support each other for the economic growth. The company in this case study appeared to be trusted. According to the news in the mass media, the mining company had a good reputation. It complied with the laws and regulations and international standards, used a modern technology, and took appropriate environmental protection measures. The mining company dedicated a fund to the local area development for remodeling of schools and hospitals in the towns and road construction, while a micro loan program was dedicated to reduce unemployment [14]. The present study investigated the relation between trust and local community's perception of company's effort to maintain environmental protection.

The local community consists of town citizens and nomadic herders who live at different distances from the mine site. Norton and Steinemann [15] described that folks, living in a particular area, value the ecosystem more than other people, which connects them to their ancestors and future generation. Additionally, studies based on community surveys illustrated that residents' environmental perceptions depend on the spatial distribution of residency [16], specifically, "residents living closer to a natural resource are possibly more concerned with its environmental quality" [17]. Considering this literature, we conducted the survey to compare the nomadic herders who lived in proximity to the mine site with the herders in far distances and town citizens.

2. Theories of Trust

Barber [18] (pp. 9–15) described trust as an "expectation" that "partners in interaction will carry out their fiduciary obligations and responsibilities, which are their duties in certain situations to place others' interests before their own". Mollering [19] (pp. 110–111) described that trust is the hub of a wheel surrounded by reason, routine, and reflexivity in the rim and explained as following. The reason for trust is the interests or tasks of the subjects in the particular situation. The subjects follow routines that consist of written and unwritten rules. Working together for a while builds trust, which increases reflexivity and allows the uninterrupted completion of tasks. Risks, vulnerabilities, and uncertainties are suspended through the action; thus, the suspension connects the hub and rim to ensure that the wheel turns successfully.

Additionally, local community's trust in a mining company has been studied in relation to an individual's social relation. Studies of the local residents' interviews provided opportunity to find trust dimensions at the micro scale [3]. Horowitz [20] described a case of the residents' trust in scientists' information about environmental assessment and concluded that trust depends on an individual's "affiliation", which was described as "a sense of solidarity with the protest group or the mining company." Dougherty and Olsen [3] defined an individual's self-efficacy as an individual's "belief in his/her capability to control . . . events". Self-efficacy influences institutional trust and interpersonal trust, which are related to support and opposition of the mining activity, respectively.

2.1. The Determinants of Trust

How is trust built in public? The studies on public trust in risk managing organizations have described different determinants of trust. Peters [21] found that trust increases if public perceptions of the knowledge and expertise, openness and honesty, and concern and care are high. Moffat and

Zhang [8] indicated that a mining company's effort to improve social infrastructure, contact quality, and procedural fairness is significantly related to trust. In the study of Nakayachi et al. [22], motivation, ability, and salient value similarity (SVS) determined public trust in eight risk managing organizations in Japan. In this study, we refer to the determinant of trust as motivation, ability, and the company's effort to maintain environmental protection (abbreviated as "environmental protection"). These determinants are described below. In some studies, SVS is the determinant of trust, but here we defined it separately using the answers of an open-ended question.

The first determinant is motivation. Trust is formulated based on the perception of fairness [23] and care [21]. For example, in the case of mining, the members of a local community observe whether the mining company takes care of the issues that residents face due to the mining operation and solves them fairly. The second determinant is ability, which is related to the knowledge and intelligence [24] and expectations of technically competent performance [18]. In the study of Dougherty and Olsen [3], the residents trusted the mining company, saying, "The company has good and reliable equipment". People develop trust when they believe in the ability and reliability of a subject [25]. We define the ability based on the above-mentioned characteristics of knowledge, expertise, intelligence, and competitive performance. For example, in the case of mining, the members of local community consider whether a mining operation utilizes reliable technologies and equipment and whether the professionals and workers at the mine site have knowledge and skills to mitigate the negative effects on the natural environment and social life.

As the third determinant of trust, we propose that residents' perception of the company's effort to maintain environmental protection affects trust. It is based on residents' evaluation of how the company is monitoring and mitigating negative environmental effects during extended period of the mining operation. Trust is built based on the local community's expectations that the mining company will make proper environmental decisions [8]. Residents expect the natural environment to be same as before the mining started so they can use the land again.

For this study, we examined whether the above-mentioned three determinants define trust of local community, as shown in the model in Figure 1. Further, the relation between trust and the three determinants was examined considering diverse structure of the community.

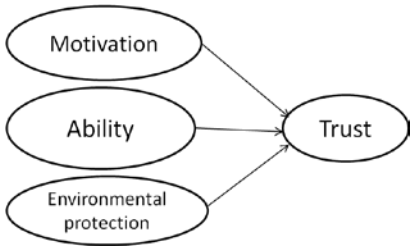

Figure 1. Model tested in the study.

2.2. Salient Value Similarity (SVS) in this Study

SVS is one of the strong factors that influence trust. It is defined as an evaluation of values shared by the subjects. Individuals who judge an organization's values to be similar to their own values have more trust in the organization [26]. Salient value differs across situations and individuals depending on the problem and available solutions [27]. For example, if the rate of cancer was higher in one area compared to other areas, the residents of that area would expect the authority to pay particular attention to the public health and information policy. If the authority prioritized these values, the residents would trust them [27].

Considering this case study, what could be the salient value for the residents living in the area where a mining company was operating? For nomadic herders, salient value might be the use of pastureland and water for livestock, since the mining operation might alter the natural landscape

or have negative effects due to the use of toxic chemicals. Meanwhile, other residents might expect the mining operation to benefit the area or the country economically. If the mining company shares these important values and does not pollute the pastureland and water while contributing financially, then the herders and other residents would develop trust in the company. In this respect, we aimed to determine the salient value for the residents in this case study separately from the determinants directly related to trust. We analyzed the answers of an open-ended question to determine SVS.

3. Methods

3.1. Study Area and Respondents

G Mine (the mining company's identity is withheld) and the residents of two adjacent *soums* (a *soum* is a territorial administrative unit in Mongolia, similar to a district) in Selenge Province, Mongolia, were selected for the survey. The distances between the mine site and the two central towns of the *soums* were 19 and 25 km, respectively.

The questionnaire was administered to the local community members in the two *soums* in August 2014. We obtained responses from 91 respondents between the ages of 18 to 71, with a mean age of 41 (SD = 14). In the quantitative analyses, we included all responses. In the qualitative analyses, we excluded the data from the respondents with missing answers, using 71 responses (male n = 33, female n = 38).

The respondents were grouped into three groups: the town citizens, herders residing close, and other herders, as shown in Table 1. It was based on the answers to a question about the distance between living location and the mine site.

Table 1. The respondent groups by the locations of residence.

Respondent Groups	Number of Responses	Locations of Residence
Town citizens	35	In the central towns of *soums*, far from the mine site
Herders, residing close to the mine site (abbreviated as "herders residing close")	17	In the proximity to the mine site
Other herders	19	Within the territories of the *soums*, far from the mine site

We visited *ger* (a *ger* is a dwelling of nomadic herders) houses of the herders and collected answers from an adult in the family. Five respondents were crop farmers who cultivated wheat and vegetables seasonally near the mine site and had livestock as well; hence, we categorized them as herders. Regarding the total years of living in this *soum*, the respondents residing for more than 30 years, 11–30 years, 6–10 years, and up to 5 years comprised 31%, 39%, 21%, and 8% of the samples, respectively. The answer sheets were attached to a letter stating the purpose of the study and a statement ensuring that the identity of the respondents will not be revealed.

3.2. Questionnaire

3.2.1. Qualitative Data of the Open-Ended Questions

The answers to open-ended questions were coded using structural coding method [28] (pp. 66–70) to find a core phrase with the highest frequencies. The following questions were evaluated.

1. To define SVS for this case study, the question "What does the mining company need to consider carrying out a long-time mining operation?" was used. The respondents were instructed to list up to three answers in the order of importance. The first out of the three answers were selected and analysed, yielding the total number of 46 answers.
2. To reveal and discuss the respondents' opinions about the company, the question "What is your opinion about the mining company and its activities?" was used. The responses were collected from 37 participants (herders residing close n = 15, other herders n = 8, and town citizens n = 14).

3.2.2. Quantitative Data

The questions listed below assessed the trust level and elements that determined the trust on a five-point Likert scale [29] ranging from "strongly disagreed" (1) to "strongly agreed" (5). The questions and the analyses were designed based on the literature review [22,30] and a preliminary survey conducted in the same region in August 2013. Statistical analyses were conducted using IBM SPSS 24.0 software (IBM, Armonk, NY, USA).

Questions assessing the trust and its determinants:

- Trust

1. "Residents respect the company."
2. "Residents rely on the company."

- Motivation

3. "The company is very conscious about the issues related to residents."
4. "The company treats all problems fairly."

- Ability

5. "The mining operation and mineral processing follows the appropriate technological regimes using modern equipment and machinery."
6. "Workers in the mining company are highly skilled."

- The company's effort to protect environment (Environmental protection)

7. "The company is serious about environmental problems."
8. "The company conducts environmental monitoring and controls contamination."

A quantitative question about information communicability of the company investigated whether the company provides information to the local residents about the mining operation, the company's activities in the area, and monitoring of environmental contamination and rehabilitation. The response options included not at all, rarely, seldom, often, and quite often.

4. Results and Discussion

4.1. Reliability Coefficients

For each determinant, the correlations between the two items were calculated to determine the Cronbach's alpha reliability [31]. The values were as follows: ability ($\alpha = 0.61$), motivation ($\alpha = 0.62$), environmental protection ($\alpha = 0.64$), and trust ($\alpha = 0.50$). The coefficients were moderate; thus, the mean value of the two items measuring each element was used for further analyses.

4.2. Determinants of Trust

To examine the determinants of trust, multiple regression analysis was conducted following the studies of Peters [21] and Sato and Ohnuma [30]. The results showed that the respondents' perception of environmental protection, motivation, and ability affected trust in the mining company, as shown in the path diagram in Figure 2 (multicollinearity coefficient VIF < 1.41; thus, the independent variables are not linearly related [32]).

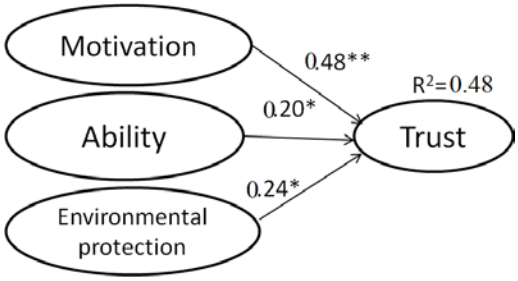

Figure 2. The determinants of trust for all respondents. * $p < 0.05$, ** $p < 0.001$.

4.3. Trust Level Differences between the Respondent Groups

Trust was determined by the three elements, as indicated in Figure 2. Thus, we examined the trust level differences between the respondent groups. The mean values of the three determinants and trust are shown in Table 2.

To measure the mean differences, we conducted the analysis of variance (ANOVA) with the three respondent groups as the predictor variables. Trust and the three determinants were the dependent variables and each dependent variable was tested separately. The results indicated that none of the following determinants were significant: ability $F(2, 68) = 0.08$, $p = 0.92$; motivation $F(2, 68) = 1.51$, $p = 0.23$; and environmental protection $F(2, 68) = 62$, $p = 0.54$. Only the interaction effects for the respondent groups in trust variable was significant, ($F(2, 68) = 3.90$, $p < 0.05$), which illustrates that the trust levels among the three respondent groups were statistically different. Further, a post-hoc test was used to compare the trust levels between the respondent groups (Tukey $p < 0.05$). The result showed that the trust levels were different for the town citizens and herders residing close. This illustrates that the town citizens had a high trust in the mining company, whereas the herders residing close had a lower trust. The differences between the other herders and the other two respondent groups were non-significant, which means that the other herders had neutral opinion regarding trust.

Table 2. Mean values of each element and trust by the respondent groups.

Items	Ability	Motivation	Environmental Protection	Trust
Respondent Groups	**Mean (SD)**	**Mean (SD)**	**Mean SD**	**Mean SD**
Herders residing close	3.97 (1.01)	2.82 (1.22)	3.15 (1.27)	3.15 (1.27)
Other herders	3.95 (0.72)	3.45 (1.05)	3.37 (1.04)	3.63 (1.12)
Town citizens	3.87 (0.98)	3.34 (1.20)	3.54 (1.26)	4.06 (0.94)

4.4. Relation between Trust and the Determinants for Each Respondent Group

The town citizens had high trust while the herders residing close had lower trust. Subsequently, we investigated the associations between the determinants and these trust levels. To achieve this, we computed Pearson's correlations between trust and the three determinants: ability, motivation, and environmental protection, for each respondent group, as shown in Table 3.

Table 3. Correlations between trust and the determinants by the respondent groups.

Respondent Groups	Items	Ability	Motivation	Environmental Protection
Herder close	Trust	0.70 **	0.82 **	0.64 **
Other herders	Trust	0.33	0.32	0.43
Town citizens	Trust	0.06	0.62 **	0.50 **

** $p < 0.01$.

According to the table above, trust in the mining company significantly correlated with ability, motivation, and environmental protection for the herders residing close; and with motivation and environmental protection for the town citizens. For the other herders, trust did not correlate with the three determinants.

4.5. Results of the Open-Ended Question and Discussion

The previous results revealed that each respondent group showed different trust levels towards the three determinants. We wanted to know the reasons for these differences based on the respondents' answers to the open-ended questions.

4.5.1. Defining Salient Value of the Respondents

When trust level is low, SVS has been found to influence public trust in a risk managing organization [22]. In this study, SVS was not examined as a determinant of trust; however, we wanted to know whether there was a connection between low trust and SVS. Salient value varies with the situation; hence, we defined it for this case study. The answers to the open-ended question were analyzed by coding. Two main themes emerged, as shown in Table 4: (A) no environmental contamination and good rehabilitation; and (B) contribution to the local area development. The remaining answers, which had different meanings than A or B, were placed in C category and excluded from the analysis. The number of A and B responses was analyzed using the chi-square test. The results showed that A occurred at a significantly higher rate ($\chi^2 = 5.49$, $p < 0.05$) compared to B, representing the salient value of the respondents.

Table 4. Defining the salient value: The coded answers.

Codes	Samples of Answers	Number of Responses
A. No environmental contamination and good quality rehabilitation	Do not cause contamination of the natural environment Good quality rehabilitation to be conducted in the mined land	$n = 28$
B. Contribution to the local area development	The mining company has to support the local area financially	$n = 13$

According to the responses of all participants, the mining company must consider the quality of rehabilitation and environmental contamination as a salient value to continue mining operations for long period.

4.5.2. Positive Perceptions

The town citizens had high trust in the mining company, which correlated positively with the determinants of motivation and environmental protection. Some town citizens answered to the open-ended question about the environmental protection of the company positively, stating, "The company is good at restoring the mined-out areas, which was broadcasted on local TV" (4 residents of town citizens). Regarding the company's motivation to care about the area, the participants responded, "They helped financially and had a fund to support the businesses of the residents". This result is consistent with Dougherty and Olsen's [3] study who indicated that "Trust in a spatially distant institution is institutional trust. People with this type of trust are not influenced by the emotions of surrounding people and usually support the mining operation". In addition, during the field survey, the town citizens mentioned that the company constantly distributed brochures and monthly newspapers in the towns. We assume that the town citizens' perceptions of the mining company were based mainly on two factors: (1) the company's activities in the towns; and (2) the information about the mining operation and environmental protection measures distributed by the mining company in the two towns.

4.5.3. Perceptions of Negative Environmental Effects

The herders residing close had low trust in the mining company. The mean ability was slightly higher compared to the two other respondent groups; thus, we assume that ability did not affect the low trust of the herders residing close (Table 2). Therefore, the low trust was the result of the determinants of environmental protection and motivation. On the open-ended question, the respondents expressed negative perceptions of environmental changes due to the mining activity based on their personal observations (the other herders had same opinions).

> *There was a beautiful hill, but now it has been ruined (Respondents: 2 herders residing close). The mining operation greatly damaged the natural environment (Respondents: 2 herders residing close, 1 other herder). The seven lakes have been dug in the [open] pit mine, which cannot be filled back, even after the rehabilitation is finished (Respondents: 3 herders residing close, 1 other herder).*

In addition, environmental effects of some facilities at the mine site were perceived as follows:

> *The waste water with cyanide in this lake [the tailings dam] may be penetrating and polluting ground water (Respondents: 2 herders residing close). The mine uses a lot of ground water through many ground water wells. Now soil in the pasture land has become dry (Respondents: 4 herders residing close).*

Herders who lived close to the mine site had negative perceptions that have resulted in low trust [22]. Their responses differed significantly from those of the town citizens. Before the mining operation started, the herders residing close used the land to graze livestock or cultivate wheat crops in the valley. During the mining, the valley has changed significantly as a result of digging the hill and forming some lakes. These herders expected to use the land after the mining has finished, but in the meantime, they observed severe environmental damage. Thus, people living near the mine sites are more likely to notice more environmental problems compared to the people who live further away. This should be considered in environmental decision-making processes [15]. Changing landscape in rural areas by using natural resources leads to contradicting opinions; therefore, concerns of the local residents should be taken seriously [33]. This finding is consistent with the results of study on environmental perceptions, showing that residents who lived close to a creek were concerned more about water quality compared to residents who lived further away [16]. Thus, the environmental protection measures should be presented first to the herders living near the mine to maintain trust.

Related to motivation, the herders residing close did not respond much. Instead, some herders residing close expressed their dissatisfaction with economic benefits of the mining operation.

> *The mine was there for too short; it provided no benefit to the country/local area (Respondents: 3 herders residing close, 1 other herder). The company dug tens of tons of gold but nothing has changed for us (1 herder residing close).*

The unmet expectations of economic benefit among herders living close to the mine site resulted in low trust [34]. They did not feel that the mining company's financial contribution in the two towns was satisfying.

The residents supported the current mining activity and did not resist during the mining operation for a decade. However, during this field survey, some residents mentioned that they did not want the mining company to start a new mining activity, although the preparation was underway in one of the *soums* (one respondent each from herders residing close and other herders). The company's efforts to contribute financially and engage in active communication in the local area did not translate into long lasting successful relationship in the future. The trust decreased when their expectations failed. These findings are consistent with the study about "the lack of trust changes the way people make decisions about important issues" [35].

4.5.4. Far from the Mine Site

The other herders, which were also nomadic herders, were neutral in terms of trust, possibly due to living further away from the mine site and not getting the information about the company. They were concerned mainly about the land, saying "We want the pasture land back for livestock grazing" (three respondents of other herders). The mining area was important to the herders for livelihood as a pasture land. Few respondents had the same opinions about the environmental effects of the mining activity as did the herders residing close, but these responses did not influence other herders' trust level significantly.

5. Information Communicability

The studies of Peters [21] and Moffat and Zhang [8] indicated that the amount of information received from the mining company and contact quality affect trust. In this study, 43% of the town citizens, 71% of the herders residing close, and 79% of the other herders responded that they did not receive any information about the mining project. According to this result, most of the town citizen respondents received consistent information because they had easy access to the information sources, such as TV and two representative offices of the mining company in both towns. On the contrary, most herders answered they did not get such information. It might be because the mining company disseminated information mainly in the towns. The herders residing close and other herders who lived tens of kilometers away from the towns did not have access to consistent information. The only way for them to obtain the information was to visit the towns.

On the open-ended question, some respondents mentioned that they received information from the company about the rehabilitation in the mined area and the financial contribution for the local area development. The company highly prioritized the establishment of a positive relationship with the local community. Two representative offices actively communicated with the residents and constantly distributed newspapers and brochures that contained information on the company's activities, such as public meetings, financial contributions, and environmental contamination control conducted through regular monitoring programs [36].

6. Conclusions and Recommendations for Mining Companies

In this case study, we examined the local community's trust in the mining company and the determinants of trust, including motivation, ability, and environmental protection using a questionnaire survey. We assessed the residents' perceptions of company's effort to maintain environmental protection as a new determinant of trust in addition to other determinants. The result of SVS indicated that most respondents believed that it is important to minimize environmental changes for long lasting mining operation. Furthermore, the determinants of trust significantly affected the trust levels. Specifically, the herders who lived close to the mine site had low trust, which was significantly related to their perception of the company's effort to maintain environmental protection. This respondent group was sensitive to environmental effects of the mining activity on the land they inherited from their ancestors, which they hoped to use again after the mining operation. On the contrary, the town citizens had high trust in the mining company, evaluating positively the company's motivation. Some other herders showed neutral trust that was not affected by any determinants.

In addition, the company's communication, including the information dissemination, influenced different trust levels in that easy access to the information sources resulted in high trust among the town citizens while the herders with limited information had low trust.

Based on the results, mining companies need to detect the groups with different values in the community while learning from local systems and collecting adequate knowledge [37]. Further measures can be taken to recover or maintain trust level within the community. These could include: (1) listening and responding through conducting surveys [38]; (2) actively engaging in decision making processes [26]; (3) establishing environmental monitoring with participation of residents [37];

and (4) considering environmental perceptions of the residents residing close to the mine cite [16]. The accumulation of positive perceptions over time would lead to long lasting trusting relations [39] (p. 69). Moreover, it is difficult to identify the concerns of communities because "communities have few constructive ways to be heard" [38].

The mining company's financial contribution to the area increased positive perceptions of the company; however, it is not the only factor that gained support in the area. Literature on successful mining operations indicates that the mining company can offer long-term benefits to the region and minimize negative environmental effects, even though some residents are highly aware of the negative environmental effects [40,41].

Several months after this field survey, the company encountered a resistance movement by some residents and a NGO against the new mining operation, which was under preparation. The protestors developed a slogan to protect a mountain, including head-water area and the historical tombs. Before the resistance movement, if the mining company gathered sufficient knowledge about the residents' low trust that disrupted the balance of power between the local community and the mining company, it might have prevented the resistance. Consistent with the initial intention to clarify the local community's trust in a mining company, this research identified the state of trust before the resistance movement.

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References

1. Conde, M.; Le Billon, P. Why do some communities resist mining projects while others do not? *Extr. Ind. Soc.* **2017**, *4*, 681–697. [CrossRef]
2. Temper, L.; del Bene, D.; Martinez-Alier, J. Environmental Justice Atlas. Available online: https://ejatlas.org/ (accessed on 10 August 2017).
3. Dougherty, M.L.; Olsen, T.D. They have good devices: Trust, mining, and the microsociology of environmental decision-making. *J. Clean. Prod.* **2014**, *84*, 183–192. [CrossRef]
4. Bebbington, A.; Williams, M. Water and Mining Conflicts in Peru. *Mt. Res. Dev.* **2008**, *28*, 190–195. [CrossRef]
5. Dalaibuyan, B. Mobilizing against Dispossession: Gold Mining and a Local Resistance Movement in Mongolia. *J. Cent. North. Humanit.* **2012**, *5*, 13–32.
6. Beck, L.; Mendel, T.; Thindwa, J. *The Enabling Environment for Social Accountability in Mongolia*; Report; World Bank: Washington, DC, USA, 2007.
7. Reeves, J. Mongolia's Environmental Security. *Asian Surv.* **2011**, *51*, 453–471. [CrossRef]
8. Moffat, K.; Zhang, A. The paths to social licence to operate: An integrative model explaining community acceptance of mining. *Resour. Policy* **2014**, *39*, 61–70. [CrossRef]
9. Möllering, G.; Bachmann, R.; Hee Lee, S. Introduction: Understanding organizational trust-foundations, constellations, and issues of operationalisation. *J. Manag. Psychol.* **2004**, *19*, 556–570. [CrossRef]
10. Jigjid, R.; The Minister of Mineral Resources Mongolia. Speech at a Conference of "Geology and Exploration in Mongolia-2016." on 4 March 2016. Available online: https://www.infomongol.mn/content/print/67483.htm (accessed on 9 September 2016).
11. Tumurtogoo, E. Food Demand and Supply of Mongolia. Available online: http://www.nodai.ac.jp/cip/iss/english/9th_iss/fullpaper/1-2-4msua-enkhbayar.pdf (accessed on 13 October 2017).

12. Sharma, V.; Dalaibuyan, B.; Erdenebileg, G.-O.; Natsag, M.; Adiya, S. Traditional Livelihoods and Mining in Mongolia's Changing Climate: Exploring the Potential of Cross-sectoral Partnerships in Achieving Sustainability. *APN* **2016**, *6*, 8–12. [CrossRef]
13. Cane, I.; Schleger, A.; Ali, S.; Kemp, D.; McIntyre, N.; McKenna, P.; Lechner, A.; Dalaibuyan, B.; Lahiri-Dutt, K.; Bulovic, N. *Responsible Mining in Mongolia: Enhancing Positive Engagement*; Report; Sustainable Minerals Institute, The University of Queensland: Brisbane, Australia, 2015.
14. Interview with a manager of the mining company (Ulaanbaatar, Mongolia). Personal communication, 2013.
15. Norton, B.G.; Steinemann, A.C. Environmental values and adaptive management. *Environ. Values* **2001**, *10*, 473–506. [CrossRef]
16. Brody, S.D.; Highfield, W.; Peck, B.M. Exploring the mosaic of perceptions for water quality across watersheds in San Antonio, Texas. *Landsc. Urban Plan.* **2005**, *73*, 200–214. [CrossRef]
17. Brody, S.D.; Highfield, W.; Alston, L. Does location matter? Measuring environmental perceptions of creeks in two San Antonio watersheds. *Environ. Behav.* **2004**, *36*, 229–250. [CrossRef]
18. Barber, B. *The Logic and Limits of Trust*; Rutgers University Press: New Brunswick, NJ, USA, 1983; pp. 9–15, ISBN 0-8135-0958.
19. Mollering, G. *Trust: Reason, Routine, Reflixivity*, 1st ed.; Elsevier Ltd.: Oxford, UK, 2006; ISBN 978-0-08-044855-8.
20. Horowitz, L.S. "Twenty years is yesterday": Science, multinational mining, and the political ecology of trust in New Caledonia. *Geoforum* **2010**, *41*, 617–626. [CrossRef]
21. Peters, R.G.; Covello, V.T.; McCallum, D.B. The Determinants of Trust and Credibility in Environmental Risk Communication: An Empirical Study. *Risk Anal.* **1997**, *17*, 43–54. [CrossRef] [PubMed]
22. Nakayachi, K.; Kudo, D.; Ozaki, T. Trust in organizations conserned with risks of the Great East Japan Earthquake. *Jpn. J. Psychol.* **2014**, *85*, 139–147. [CrossRef]
23. Renn, O.; Levine, D. Credibility and trust in risk communication. In *Communicating Risks to the Public*; Springer: Dordrecht, The Netherlands, 1991; pp. 175–218.
24. Hovland, I.; Janis, L.; Kelley, H. *Communication and Persuasion*, 13th ed.; Yale University Press Ltd.: London, UK, 1953; p. 21, ISBN 0-300-00573-3.
25. Möllering, G. Rational, Institutional and Active Trust: Just Do It!? In *Trust under Pressure: Empirical Investigations of Trust and Trust Building in Uncertain Circumstances*; Edawad Elgar: Cheltenham, UK, 2005; pp. 17–36.
26. Earle, T.; Cvetkovich, G. *Social Trust: Toward a Cosmopolitan Society*; Greenwood Publishing Group: Santa Barbara, CA, USA, 1995; ISBN 978-0275948450.
27. Siegrist, M.; Cvetkovich, G.T.; Gutscher, H. Shared values, social trust, and the perception of geographic cancer clusters. *Risk Anal.* **2001**, *21*, 1047–1053. [CrossRef] [PubMed]
28. Saldana, J. *The Coding Manual for Qualitative Researchers*; SAGE Publications Inc.: London, UK, 2009; pp. 66–77, ISBN 978-1-84787-548-8.
29. Likert, R. A Technique for the Measurement of Attitudes. Available online: https://legacy.voteview.com/pdf/Likert_1932.pdf (accessed on 5 August 2017).
30. Sato, K.; Ohnuma, S. Influence of involvement and interest over determinants of trust in authority in public decision-making. *J. Jpn. J. Soc. Psychol.* **2013**, *29*, 94–103. [CrossRef]
31. Cronbach, L.J. Coefficient alpha and the internal structure of tests. *Psychometrika* **1951**, *16*, 297–334. [CrossRef]
32. Atsushi, O. *Analysis of Psychological Survey Data by SPSS and AMOS*; Tokyo Tosho: Tokyo, Japan, 2004; ISBN 978-4-489-00675-3.
33. Soini, K.; Vaarala, H.; Pouta, E. Residents' sense of place and landscape perceptions at the rural-urban interface. *Landsc. Urban Plan.* **2012**, *104*, 124–134. [CrossRef]
34. Lewis, J.D.; Weigert, A. Trust as a Social Reality. *Soc. Forces* **1985**, *63*, 967–985. [CrossRef]
35. Luhmann, N. Familiarity, Confidence, Trust: Problems and Alternatives. In *Trust: Making and Breaking Cooperative Relations*; Basil Blackwell: Oxford, UK, 2000; pp. 94–107. [CrossRef]
36. Representative of the mining company in a town (Selenge, Mongolia). Personal communication, Interview, 2013.
37. Bebbington, A.J.; Bury, J.T. Institutional challenges for mining and sustainability in Peru. *Proc. Natl. Acad. Sci. USA* **2009**, *106*, 17296–17301. [CrossRef] [PubMed]

38. Lawson, K. Communities, Building Trust between Mining Companies and Communities. Available online: https://www.csiro.au/en/Research/MRF/Areas/Community-and-environment/reflexivity (accessed on 3 December 2017).
39. Nakayachi, K. *Safe, but Cannot Be Relieved: Psychology over Trust*; Chukuma Shimpo Publishing: Tokyo, Japan, 2008.
40. Prno, J.; Scott Slocombe, D. Exploring the origins of "Social license to operate" in the mining sector: Perspectives from governance and sustainability theories. *Resour. Policy* **2012**, *37*, 346–357. [CrossRef]
41. Moffat, K.; Zhang, A.; Boughen, N. *Australian Attitudes toward Mining: Citizen Survey—2014 Results*; CSIRO: Canberra, Australia, 2014; pp. 1–16.