

Article

Environmental Justice and Sustainability Impact Assessment: In Search of Solutions to Ethnic Conflicts Caused by Coal Mining in Inner Mongolia, China

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Abstract: The Chinese government adopted more specific and stringent environmental impact assessment (EIA) guidelines in 2011, soon after the widespread ethnic protests against coal mining in Inner Mongolia. However, our research suggests that the root of the ethnic tension is a sustainability problem, in addition to environmental issues. In particular, the Mongolians do not feel they have benefited from the mining of their resources. Existing environmental assessment tools are inadequate to address sustainability, which is concerned with environmental protection, social justice and economic equity. Thus, it is necessary to develop a sustainability impact assessment (SIA) to fill in the gap. SIA would be in theory and practice a better tool than EIA for assessing sustainability impact. However, China's political system presents a major challenge to promoting social and economic equity. Another practical challenge for SIA is corruption which has been also responsible for the failing of EIA in assessing environmental impacts of coal mining in Inner Mongolia. Under the current political system, China should adopt the SIA while continuing its fight against corruption.

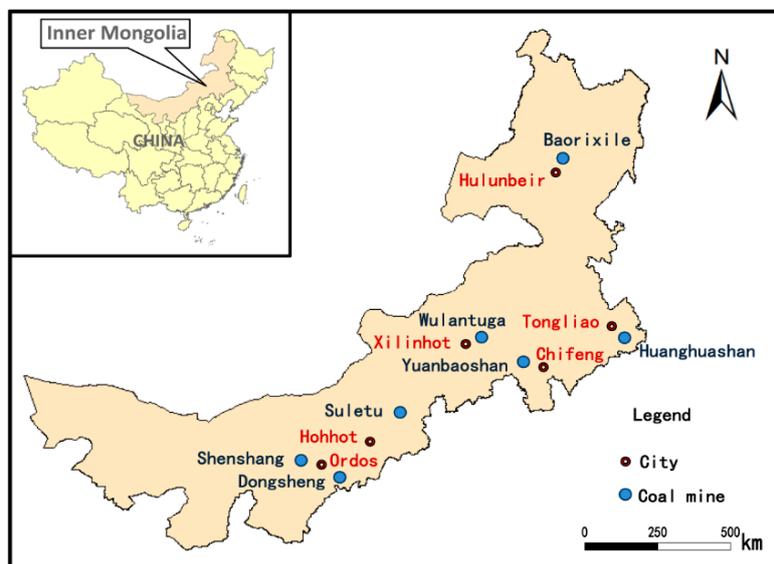
Keywords: environmental impact assessment; sustainability impact assessment; environmental justice; public participation; ethnic conflict; China

1. Introduction

The Inner Mongolia Autonomous Region forms much of China's strategic northern frontier bordering Mongolia and Russia. In a region where protest is rare, a series of Mongolian demonstrations across the region, including these in the capital Hohhot, took the world by surprise in the spring of 2011. Students demonstrated and clashed with police, demanding justice. The events were triggered by an incident near Xilinhot (Figure 1). A Chinese truck driver killed a Mongolian herdsman who was blocking a convoy of coal trucks from driving through his pastureland. Chinese and international media widely reported the protests that underscored simmering discontent over environmental damage from mining in this resource-rich region [1–3]. To quell the demonstrations, the government declared martial law and cracked down on the activists while pledging to look into the impact of the mining industry on the environment and local culture.

We were curious how mining-related environmental problems led to ethnic conflicts in a region that had been relatively free of ethnic tensions in recent history. Our initial investigation indicated that mining caused serious environmental and economic injustice to the Mongolian herdsmen. We found earlier reports on mining pollution in Inner Mongolia. For example, the *Beijing Youth Daily* reported that a few rare-earth refineries polluted the grassland and killed 60,000 livestock that belonged to 190 herdsmen from 1996–2003 [4]. Another report found that arsenic poisoning was threatening the lives of the nearly 300,000 people in the Ordos Region; 2000 were already sick and many died of cancer, producing cancer villages [5]. China has hundreds of cancer villages, places where cancer rates are unexpectedly high and industrial pollution is suspected as the main cause [6]. However, most of them are in the more developed regions on the eastern coast. In Inner Mongolia, the main cause is suspected to be water pollution caused by mining.

Figure 1. Location of the studied cities and coal mines in Inner Mongolia.



Mongolians have many long-established grievances, such as those reported by Jacobs: the ecological destruction wrought by an unprecedented mining boom, a perception that economic growth disproportionately benefits the Chinese and the rapid disappearance of Inner Mongolia's pastoral tradition [7].

Qian *et al.* find quantitative evidence to support the conclusion that the expansion of coal mining and associated industry and population increase was the major cause of grassland degradation in the Hologol region of Tongliao City, Inner Mongolia [8]. While mines are expanding, underground water is being over-extracted and coal-fired power plants as well as chemical plants are being established [9]. Coal mining and associated electricity generation have seriously degraded the water resource and the livelihood of local people in Inner Mongolia [8].

Greenpeace reports that in China, a coal chemical project in the dry Inner Mongolia region, part of a new mega coal power base, had extracted so much water in 8 years of operation that it caused the local water table to drop by up to 100 m, and the local lake to shrink by 62%. Due to lowering of water table, large areas of grassland have subsided (Figure 2). The drastic ecological impacts have forced thousands of local residents to become 'ecological migrants' [10]

At the costs of the environment and local residents' livelihood, Inner Mongolia has since 2002 experienced an economic boom based on mining. The wealth from the economic boom has not been fairly distributed. Many Chinese investors have benefited from the mining operations and become billionaires. Ordos became one of the wealthiest cities in China. However, ordinary Mongolian herdsman are not benefiting from that boom, which is based on exploitation of what they view as their resources. Coal development on the grasslands does not increase the herdsman's income or materially improve their life but instead has dampened their future by degrading the environment [11], causing injustice and sustainability disparities [12,13].

Figure 2. Baorixile, Hulunbeir, Inner Mongolia: grassland subsidence due to lowering of water table caused by coal mining [10]. © Lu Guang/Greenpeace.



The paper draws from global knowledge of environmental justice and assessment approaches and applies it to Inner Mongolia. It argues for the need of developing a sustainability impact assessment (SIA) and demonstrates that such a need is particularly urgent for subtle ethnic regions such as Inner Mongolia. We explore answers to five related questions: (1) What are the theoretical bases for developing an SIA that emphasizes justice? (2) How have assessment approaches been practiced in China? (3) Why has environmental impact assessment (EIA) not worked for Inner Mongolia in the current EIA system? (4) How and why do we need to explore an SIA that supports environmental justice in order to help with sustainability? (5) What should China do in search of solutions to ethnic conflicts in Inner Mongolia?

The analyses were based on data collected during fieldwork through qualitative research methods including site inspections and semi-structured interviews and discussions with local officials and scholars concerning environmental and economic issues. The study covers seven major coal-mining areas: Dongsheng, Shenshang, Suletu, Yuanbaoshan, Wulantuga, Baorixile, and Huanghuashan, in six associated city regions: Ordos, Hohhot, Xilinhot, Chifeng, Tongliao, and Hulunbeir (Figure 1). Primary and secondary data were collected during fieldwork in the summers from 2011–2013. The initial report was presented and discussed at the International Conference on Sustainability Assessment at Dalian Nationalities University. Follow-up fieldwork and research was conducted after the conference to further verify and interpret the research findings. We realize that our study areas were limited to only a few places. Due to lack of time, financial support, and availability of data and information, we were not able to obtain quantitative data or conduct more in-depth investigations. Environmental justice, sustainability impact assessment and ethnic conflicts in China are topics that are contested and require more systematic research. As a result, caution is needed when drawing conclusions from our findings.

In search of solutions to environmental degradation, injustice, and ethnic conflicts in the region, we first examine how project assessment tools could help. For example, environmental impact assessment (EIA) has been regarded as an important measure to control environmental impact in many countries, and some governments, such as those of the United States and Scotland, have attempted to use environmental assessment tools to deliver environmental justice [14]. However, environmental assessment tools in theory and practice appear to be inadequate when sustainability, not just the environment, is the subject for assessment.

2. The Theoretical Basis for Sustainability Impact Assessment that Supports Environmental Justice

This section starts with an overview of the meaning of sustainability and its indicators, and criteria that have been used or proposed for EIA. Following discussions over the use of existing assessment approaches to assess sustainability, the focus is on exploring the possibility of incorporating justice and equity into existing assessments and SIA.

2.1. Sustainability: The Three Pillars

Sustainability means meeting the needs of the present without sacrificing the ability of future generations to meet their own needs [15]. It has been illustrated as having three overlapping dimensions: the simultaneous pursuit of economic prosperity, environmental quality, and social equity,

also known as the “three pillars” of sustainability [16–18]. In addition, cultural sustainability is widely regarded as an important element for people to achieve a more satisfactory intellectual, emotional, moral and spiritual existence. Recent holistic and inclusive thinking of sustainability emphasizes overlapping dimensions and the interaction among them [18]. In addition to environmental and material needs that may be fulfilled through economic development, humans also need social development to improve social justice, equality, and security. While acknowledging the interactions among different dimensions, Gibson *et al.* caution against a simplistic application of the three pillar model, pointing out that it serves to emphasize tensions among competing interests [19]. In contrast, their criteria cross the traditional and limiting divides to provide a more holistic conceptualization [19]. They also criticize approaches to sustainability that over-emphasize local considerations or that focus too strongly on efficiency measures, recalling that the sustainability discourse is essentially global and the West must challenge some fundamental cornerstones of its way of life, and particularly the obsession with economic growth [19].

2.2. Sustainability and Justice

Dobson provides a detailed discussion of the relationship between environmental justice and sustainability. He argues that “the discourses of sustainability and justice may be related” but “the question of whether sustainability and justice are compatible objectives can only be resolved empirically, and the range and depth of empirical research required in resolving this question has not been done” [20]. We argue that SIA for subtle ethnic regions such as Inner Mongolia should stress justice, including environmental, social, and economic justice, and equity, which has been recognized as a key element of sustainability. Sustainability is about meeting needs. Justice has increasingly been recognized as one of such needs. There is no sustainability without justice. Furthermore, the United Nations resolution 66/197 on sustainable development pays special attention to the welfare of ethnic minorities: recognizing and supporting their identity, culture and interests; avoiding endangering their cultural heritage, practices and traditional knowledge; and preserving and respecting non-market approaches that contribute to the eradication of poverty [21]. Iris Marion Young has also questioned the common practice of reducing social justice to distributive justice and argued for group-differentiated policies and a principle of group representation [22]. Using justice as an overarching element can help develop a more holistic SIA for ethnic regions such as Inner Mongolia.

The concept of environmental justice was first developed in the early 1980s during the social movement in the United States on the fair distribution of environmental benefits and burdens. The United States Environmental Protection Agency defines environmental justice as “the fair treatment and meaningful involvement of all people regardless of race, color, sex, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations, and policies” [23]. Three different notions of justice have been applied, including distribution, recognition, and procedure (or participation) [24]. Procedural justice means that those who are most affected by decisions should have particular rights to be involved and have their voices heard on a fully informed basis [25]. Participation has also been demanded as an instrument of EIA. Since *ex ante* analysis of potential impacts of planned projects on the environment is difficult, participation is intended to reduce uncertainty by intra-subjective judgment; furthermore, participation increases the transparency of the

decision-making process [26]. From a social science point of view, participation is a central element of sustainability [26]. Participation, however, is difficult to translate meaningfully into quantitative terms as a social indicator [26]. Direct and open debates among the people who will be affected by the development lay the foundation for conflict resolution in Inner Mongolia, if SIA can be incorporated at the planning level in order to influence decision making and support policies that affect regional sustainability [27].

2.3. Sustainability: Indicators and Criteria for Assessments

In practice, economic and social indicators and criteria have been used, in addition to environmental ones, for assessing sustainability [28]. For example, Becker presents an overview on sustainability indicators for assessing economic, environmental, and social sustainability which includes “equity coefficients (Gini coefficient, Atkinson’s weighted index of income distribution), disposable family income, and social costs, participation, and tenure rights [26]. Herder *et al.* used “production costs” and “local value added” as economic indicators and “employment” as a social indicator [29]. However, the incorporation of these sustainability truths into assessment and decision-making processes remains somewhat daunting in practice. Lamorgese and Geneletti developed a framework for evaluating planning against sustainability criteria and found that criteria explicitly linked to intra- and inter-generational equity is rarely addressed [30]. Jain and Jain emphasize the need for an alternative index which considers sustainability of human development and formulates an index based on strong sustainability [31]. Shah and Gibson have developed a set of 12 core procedural and substantive-level sustainability criteria to be used as a guide for clarifying development purposes, identifying potentially desirable options, comparing alternatives and monitoring implementation for infrastructure at the water-agriculture-energy nexus in India [32]. They believe that sustainability-based tools encourage comprehensive attention to issues at the core of sustainability thinking and application: relative to conventional assessment approaches, assessments applying explicit sustainability criteria encourage lasting benefits within complex socio-ecological systems through assessing interdependencies and opportunities, sensitivities and vulnerabilities of regional ecologies, incorporating systems, resiliency and complexity frameworks. SIA for Inner Mongolia should learn from the international experience to develop specific indicators and criteria that help with ethnic equality and harmony.

2.4. The Debate over the Use of Existing Assessment Approaches to Assess Sustainability

Researchers have been debating over the use of existing assessment approaches such as environmental impact assessment (EIA) and strategic environmental assessment (SEA) to assess sustainability. For examples, Zhu *et al.* advocate an impact-centered SEA with institutional components as an alternative to the impact-based approach which seems unable to address institutional weaknesses in most conventional SEA cases in China [33]. Lam, Chen, and Wu affirm the potential role of SEA in fostering a sustainable and harmonious society and the need to mainstream sustainability considerations in the formulation of national plans and strategies [34]. Hacking and Guthrie identify the features that are typically promoted for improving the sustainable development directedness of assessments and a framework which reconciles the broad range of emerging approaches and tackles the inconsistent use of terminology [35]. Morrison-Saunders and Retief assert that internationally there is a growing demand

for EIA to move away from its traditional focus towards delivering more sustainable outcomes [36]. They argue that it is possible to use EIA to deliver some sustainability objectives in South Africa, if EIA practices strictly follow a strong and explicit sustainability mandate [36]. To advance SEA for sustainability, White and Noble examined the incorporation of sustainability in SEA and identified several common themes by which SEA can support sustainability, as well as “many underlying barriers that challenge SEA for sustainability, including the variable interpretations of the scope of sustainability in SEA; the limited use of assessment criteria directly linked to sustainability objectives; and challenges for decision-makers in operationalizing sustainability in SEA and adapting PPP (policy, plan, and program) development decision-making processes to include sustainability issues” [37].

2.5. The Possibility of Incorporating Environmental Justice into Environmental Assessments

Jackson and Illsley proposed that SEA could be used to help deliver environmental justice [38]. Krieg and Faber suggest that environmental injustices exist on a remarkably consistent continuum for nearly all communities and a cumulative environmental justice impact assessment should take into account the total environmental burden and related health impacts upon residents [39]. Connelly and Richardson argue that “we cannot debate SEA procedures in isolation from questions of value, and that these debates should foreground qualities of outcomes rather than become preoccupied with qualities of process” [40]. They “explore how theories of environmental justice could provide a useful basis for establishing how to deal with questions of value in SEA, and help in understanding when SEA is successful and when it is not” [40]. They assert that “Good SEA must be able to take into account the distributional consequences of policies, plans, or programs, with decisions driven by the recognition that certain groups tend to systematically lose out in the distribution of environmental goods and bads” [40]. Walker finds that although practices are evolving there is a little routine assessment of distributional inequalities, which should become part of established practice to ensure that inequalities are revealed and matters of justice are given a higher profile [41]. On the other hand, Mclauchlan and Joao oppose the use of strategic environmental assessment (SEA) to deliver environmental justice, partly because “a direct focus on the environment requires that factors associated with environmental justice are not central to SEA” [14].

The literature indicates that it is possible to use environmental assessment to incorporate environmental justice criteria such as public participation. In fact, public participation is considered as an integral part of the EIA procedure [42]. A major challenge is that environmental justice is a social factor, which is not central to environmental assessments. In China, EIA is often inadequately implemented and social factors tend to be neglected. For examples, Ren finds that “EIA in China has evolved into a fairly comprehensive and technically adequate system, but the problem lies in its poor enforcement and implementation, due to the political system and incentive mechanisms, institutional arrangements, and regulatory and methodological shortcomings” [43]. Yang criticizes that “public participation in the Chinese EIA system has not been effectively carried out” [44]. These problems have significant implications to EIA in Inner Mongolia.

2.6. The Possibility of Developing Sustainability Impact Assessments with Stress on Justice

The literature on EIA, SEA, and environmental justice may provide a theoretical context for developing SIA. The theory and practice of SIA have been discussed with case studies from different parts of the world. For example, Gibson *et al.* conceptualize sustainability assessment as a marriage between sustainable development and environmental assessment [19]. Huber made the distinction of social justice based on need, on performance, and on property as different dimensions of equity, which are not taken into account in static, target-oriented sustainability policies [26]. Bond *et al.* point out that sustainability assessment is an increasingly important tool for informing planning and development decisions across the globe [45]. Required by law in some countries, strongly recommended in others, a comprehensive analysis of why sustainability assessment is needed and clarification of the value-laden and political nature of assessments is long overdue [45]. The remaining of the paper will attempt to demonstrate the need to develop an SIA that stresses justice in order to reduce ethnic tensions in Inner Mongolia.

3. Assessment Practices in China

China faces a daunting task for improving its environmental performance, particularly in the ethnic regions where the environment is fragile, ecological systems are sensitive, the economy is underdeveloped, and ethnic relations are subtle. Different approaches have been proposed to deal with the task. Many believe that economic growth is the key for environmental improvement and social political stability [46]. This belief supports China's Go West policy, which covers all provincial level ethnic regions. While that policy has resulted in economic growth in some areas, there are indications that the environmental costs have been enormous and ethnic relations are getting worse. Exploitation of natural resources in the ethnic regions is followed by rapid environmental degradation. "Go West" has in some way become "Pollute West" under the "grow first, clean up later" approach to development. Inner Mongolia is a good example. It was once an endless field of grassland, punctuated by mountains and the occasional yurt. Now Inner Mongolia is the country's top coal producer, accounting for about a quarter of all domestic supply—doubling what it was in 2005 [1].

On the other hand, sustainable development has also been the view of some top Chinese officials such as the former premier Wen Jiabao. Sustainability management has shown that environmental problems and social problems are closely related [47], especially in the case of China [48]. Among the many possible methods for improving environmental performance, EIA has been used in China, including its ethnic regions. For examples, the Asian Development Bank (ADB) was particularly comprehensive in its assessment of Inner Mongolia Environment Improvement Project (Phase II) [49], following ADB's Environmental Assessment Guidelines [50]. The ADB report recommended that Inner Mongolia install "clean coal" technologies now to reduce global warming and reverse the climate change caused by current coal mining [51]. Many coal mining companies in Inner Mongolia have drafted EIA and posted notifications for the public to provide feedback.

However, EIAs seem to have not had any significant impact, as coal mining and associated industries continue to expand. Mining pollution causes local herders to lose their sheep and cattle and thousands of pits left behind by the mining companies cause fatalities to the herds [9]. Consequently,

coal mining has contributed to increased ethnic tension and conflicts in Inner Mongolia. Investigations found that the common people have got poorer in natural-resource rich places such as Inner Mongolia, while government officials and mine bosses got extremely wealthy, increasing social unrest [52]. The Inner Mongolia Government issued a document asking local governments and agencies to follow governmental directives to adequately protect the environment and people's livelihood [53]. The document clearly stated that promised compensations to herders who lost land due to mining should be honored. Wealth from the mining should be partially used to help improve local infrastructure and living conditions. The document, however, fails to recommend any concrete procedures to insure the local residents receive their share of the mining wealth. The document encourages coal companies to invest in non-coal industries locally. This kind of investment helps to diversify the economy and increase government revenues and GDP. However, further industrialization has been accompanied by worsening environmental degradation and damage to the agricultural environment needed to support the livelihood of the Mongolian herders.

Nevertheless, progress was made. The Inner Mongolia Government claimed to have halted 476 illegal mining projects, ordered 887 mines to suspend operations, permanently shut down 73 mines, intervened in 100 disputes between local herders and mining companies, and established a mechanism involving the government, miners and local residents to resolve disputes through dialogue [54]. However, new protests continue to be reported by the international media [55]. Tang suggests that a rise in public protests in China signals a failure of environmental governance, where officials use legal threats to extract benefit from polluters, but the power of developers in China remains untouched, despite widespread protests against polluting projects [56].

4. Why Environmental Impact Assessments Have Failed for Inner Mongolia

The last section elaborates the failure of environmental assessments to do their job for Inner Mongolian mining projects. This section will specifically answer three questions: (1) why did the mining projects fail to conduct environmental assessments when they would be expected? (2) Would environmental assessments have had an impact on the projects if they were conducted? (3) Would environmental impact assessments have addressed the questions of sustainability and environmental justice adequately, even if they were conducted?

4.1. Why Did Projects Fail to Conduct Environmental Impact Assessments?

The failure of EIA may be one of the many factors for explaining environmental degradation caused by coal mining in Inner Mongolia. Here are a few scenarios based on our investigation. First, an EIA is not conducted at all. This applies to the many small scale mining operations. Many are "illegal" as they do not have any permit. These operations tend to pay no attention to the environment. They are allowed to be in operation mainly through bribing the government officials who will then turn a blind eye on the environmental destructions. Under the pressure from repeated local protests, there has been a tightening of regulations and cracking down on these operations. However, they continue to be a major threat as corruption will continue to be severe. A second scenario is that an EIA is conducted, but is falsified as the required criteria were not followed. This is concerned with the legal operations. Again, official corruption is involved, which is the main reason EIAs are not conducted or are falsified.

4.2. *Would Environmental Impact Assessments Have Had an Impact?*

We find that large state coal mines often had an EIA conducted. We examined key government directives that provide technical guidelines for EIA for coal mines. China passed its EIA laws in 2002. In 2006, Technical Guidelines for EIA Coal Mine Master Plans was drafted. The guidelines did not include any mandatory requirements in terms of EIA. That left much room for interpretation of activities as to what was appropriate. It stated that the plan should include descriptions concerning water, air pollution, land restoration, and public participation [57]. It is unclear how many EIAs were done. However, an online search found four Master Plan EIAs, which were posted for public notification as required by the EIA laws, an indication of implementation of the EIA laws and the 2006 Guidelines. These four EIAs, three from Ordos [58–60] and one from Hulunbeir [61] are identical in terms of structure and contents, suggesting that they followed the same standard format and guidelines used in coal mining in Inner Mongolia and possibly nationwide.

The public notifications are very superficial, mainly an overview of the planned project which follows the guidelines but lack any specifics. Accompanying the notifications, a survey form asks questions such as: What do you think of the current environmental conditions in your area? What impact will the project have on the environment? Do you support the implementation of the project or not? The notifications were published in local newspapers or government websites. The public were given 10 business days to respond, which was too short by international standards. A search did not find any cases where public feedback was publicized or had any effect on the plans. That might suggest that public participation did not play any role in the plan and the EIAs were done superficially. Few EIA notifications were found online for the period between 2008 and 2011, only one for 2010 [62] and one for 2011 [63].

The Technical Audit Points for Coal Mine Master Plan EIA Report was published in October 2011 by the Ministry of Environmental Protection [64], after the widespread protests in Inner Mongolia in May. This is a comprehensive directive that provides detailed requirements for coal mine planning and EIA. The Circumstances for Rejecting and Requiring Revisions of the Plan include six items and three of them are:

- A. The project may cause major impact to the ecology or underground water (quantity or quality) but the plan does not provide mature and practical ecological recovery and protection measures;
- B. The local resource and environment is unable to provide the capacity for the possible direct and indirect impact of urbanization and industrialization due to coal mining;
- C. The majority of the public participants do not support the implementation of the project plan.

One of the Circumstances for Requiring Revisions of the Plan for reevaluation includes irregularities of public participation, no explanations for accepting or rejecting public suggestions, or obviously unreasonable rejection of public suggestions. The directive also states that the master plan should ensure that the mining operation will protect the ecological integrity and biodiversity and prevent desertification. Air pollution needs to be controlled during mining, transportation, and storage, consumption, and waste management. However, many of the requirements are still vague due to lack of specifics.

The latest EIA documents we found online include two EIA notifications [65,66] and one EIA report [67]. They reflect the more stringent guidelines and contain more specifics than the 2006 and 2010 ones. The posting of an EIA Report provides information to the public. Interestingly, however, the lead author of both the 2006 and 2011 guidelines was Beijing Huayu Engineering Co., Ltd. of the Sino-Coal International Engineering Group, in cooperation with the State Environmental Protection Bureau of China (now Ministry of Environmental Protection). Huayu or some other firms within Sino-Coal have been the sole authors for the EIAs. So the guidelines and EIAs are likely to be on the side of the coal industry, rather than the affected communities. The number of EIAs available online is very small, compared to the number of mines in the region, possibly over 100. According to the Chinese search engine Baidu, there were 82 state-owned mines in Inner Mongolia in 2009, including five state-owned enterprises, 42 state-owned major mines, and 36 state-owned local mines [68]. The number should have increased, judging from the increased coal output in the region. More importantly, the new EIA requirements were probably not followed in Inner Mongolia coal mine planning and operations, judging by the high level of environmental degradation due to coal mining, as reported in Chinese official and international media. Consequently, EIAs have had only a limited impact in protecting the environment.

4.3. Would Environmental Impact Assessments Have Addressed Sustainability and Environmental Justice Adequately?

Furthermore, even if the more stringent EIA requirements were closely followed, many social problems caused by the exploitation of natural resources in the ethnic regions were not going to go away, as many Mongolians are likely to view the coal and the land as theirs, that they inherited from their ancestors, and that the Chinese are outsiders coming in to take their resources away and destroy their land and lifestyle. The central government may claim that the resources are national property. Many Mongolians may believe that the nation should be the people instead of some state officials. Considering the history of settlement and the Mongolian way of thinking, the mining plans may have to incorporate the concept of environmental justice and respect the view of the local people and culture, in addition to protecting the environment. Improvement in EIAs is needed for the environment, but EIAs are inadequate for dealing with these social problems caused by resource exploitation in the ethnic regions.

5. The Need to Stress Justice and Equity in Sustainability Impact Assessment

The above discussed problems in EIA practices in China need to be dealt with. For example, public participation needs to be strengthened to allow full involvement from the beginning of the project planning. It would be worthwhile to explore ways to have EIAs conducted by an independent third party rather than by an affiliate of the coal companies, even though that may increase the operational cost of the assessment. EIA has not been taken seriously because it concerns only the environment, which is considered as a public good in China. The government, which is supposed to take care of the environment and the resources, puts economic growth first. Public participation has not been regarded as a key element in resource development as natural resources belong to the government (Officially they belong to the state, but in reality the government, rather than the people, is the state in China).

Wealth from mining is mainly taken by the central government, with the rest of the wealth taken by different levels of the governments. The local government, which usually receives a third of the wealth, is left to take care of the social and economic welfare [52]. Corruption and lack of funding have meant little is done for the common people. Such injustice and inequity has led local people to organize to open illegal mines to steal and rob the resources, which they think should belong to them [52]. Li Bo, head of Friends of Nature, an environmental non-government organization (NGO) in China, believes that:

The environmental assessment of development projects should be much more open. The possible existence of risk for any project—technological and economic, or social and political—should be fully discussed before the project is implemented. Right now, according to the law, there is a process for EIA. But the people who are in charge of executing these are only responsible to their seniors, not to the people under them. So these processes aren't very open, and their discussions aren't transparent. Because of this many projects are approved, and then their problems are only discovered afterwards. An example is the recent PX incident—there's a lot of fear and rage. These things can tear a society apart [69].

Morrison-Saunders and Pope argue that there is inadequate consideration of trade-offs throughout the sustainability assessment process and insufficient considerations of how process decisions and compromises influence substantive outcomes [67]. If properly done, sustainability assessment should indicate who gets what, who loses what, how, when and why [70]. Current EIAs in China are concerned with trade-offs between the economy and the environment. They are not concerned with trade-offs among different social groups. We argue that SIA should be adopted for subtle ethnic regions in order to adequately evaluate economic, environmental and social impacts to help reduce ethnic tensions. These impacts are interrelated and cannot be mitigated successfully unless they are dealt with together. If fully enforced, SIA will ensure that the public is more involved and their interest is better taken care of when justice and equity are a matter of concern in the assessment.

As sustainability assessment is new in China, we draw below some international experiences to help with the discussion. Gibson *et al.* present the case of the assessment of the proposed major nickel mining project near Voisey's Bay on the north coast of Labrador (Canada), which is often considered the first attempt to conduct sustainability assessment within a project approval context [19]. They challenge the common conceptualization of sustainability of three intersecting pillars representing environmental, social and economic concerns, on which most practice of sustainability assessment is based [19]. Gibson reports that an innovative environmental assessment and a set of surrounding and consequential negotiations were conducted between 1997 and 2002 on the proposed project:

The proponent and other participants wrestled directly and often openly with the project's potential contribution to local and regional sustainability. The resulting agreements to proceed were heavily influenced by the precedent-setting assessment, which imposed a "contribution to sustainability" test on the proposed undertaking. Given the profound differences in background, culture, priorities and formal power involved, as well as the record of tensions in the history of this case and before, the agreements also represent a considerable achievement in conflict resolution [71].

Faced with growing environmental and social crises, China's new leader, Xi Jinping, has criticized the "grow first, clean up later" approach and given more emphasis on ecological development than his predecessors. Among other things, he recently called for stopping the GDP-based promotion of government leaders [72]. Consequently, several provinces have lowered or abandoned using GDP as the only measure of success for city or county leaders, affecting over 70 of China's poorest cities or counties [73]. Evaluation will instead be based on poverty reduction and environmental protection [74]. It remains to be seen if the new policy will be applied to larger, wealthier cities. Nevertheless, cleanup efforts have been increasing. Many interviewed officials cared about the environment and were sympathetic for the Mongolian herders. There are indications that EIA will be more stringently and widely implemented. Kahya reports that:

Concerns over water use from coal mining and gasification projects have led the Chinese government to change the rules for new schemes. Mirroring recent "national plans" to tackle air pollution the Ministry of Water resources has announced a plan to limit coal expansion based on regional water capacity. The rules mean the approval process for large-scale projects must now include an appraisal of the available water [75].

Mclauchlan and Joao oppose the use of strategic environmental assessment (SEA) to deliver environmental justice, partly because "a direct focus on the environment requires that factors associated with environmental justice are not central to SEA [14]." That was exactly the case with some projects that conducted EIAs. China should borrow global knowledge in environmental justice and SIA to help with local practices and leapfrog the EIA stage to start SIA instead. Less-developed ethnic regions should leapfrog the "grow first, clean up later" stage and start practicing sustainability, so that further deepening of injustice and sustainability disparities might be avoided [12,13]. EIA has been useful in some countries. An important reason is that these countries tend to follow the rule of law and have an independent media and democratic government. Environmental injustice is partly inherited in the undemocratic system. There are limited options China has as major political reforms are unlikely to happen soon. Within the current political system, SIA certainly seems to be more useful than EIA in dealing with justice and equity problems.

6. Conclusions

In this paper, we have explored the theoretical basis and possibility of developing SIA with an emphasis on justice and equity to meet an urgent need in subtle ethnic regions such as Inner Mongolia, China. In coal mining practices in Inner Mongolia, an EIA was often not conducted for the large number of small scale so called "illegal" mines, or might have been falsified for many other mines through corrupted officials. Our focus, however, has mainly been on those that have conducted official EIAs following government guidelines but still fail to protect the environment partly because the guidelines are inadequate. The government has tightened control over EIA along with more specific and stringent guidelines.

Our research indicates that even if the new EIA guidelines are closely followed social justice and economic equity problems will continue to exist, as EIAs do not deal with any ethnic social problems. The assessment needs to include guidelines for justice and equity, in addition to protect the physical

environment. EIAs appear to be inadequate for that. Even though certain elements of environmental justice such as participation can be incorporated into EIA/SEA, these elements are not central to environmental assessments. Environmental assessments are concerned with the environment while sustainability has additional concerns such as social justice and economic equity. Consequently, EIA/SEA is in theory and practice inadequate as a tool in meeting sustainability challenges.

SIA would be in theory and practice a better tool than EIA/SIA for assessing sustainability impact. The assessment needs to involve the affected ethnic groups at the very beginning and careful negotiations are needed so that agreements can be reached. This would be an appropriate approach to conflict resolution to take care of the profound differences and complex relations in the ethnic regions. Public participation in SIA is an effective measure to ensure social and economic justice and equity. SIA should recognize and respect traditional ethnic way of life, which has often been found to be environmentally sustainable. It is important to let the local people make their own decisions concerning the use of their resources. They tend to be the people who care about the environment the most and have the knowledge for sustainability. Social and economic equity, protecting the environment, and respect for nature, culture, and autonomy of local ethnic groups should all be key elements for SIA in the ethnic regions.

However, one practical challenge for SIA is corruption which has been also responsible for the failing of EIA in Inner Mongolia. China's political system presents another challenge to promoting social and economic equity. Political reforms are necessary to enhance ethnic justice and equity. Under the current political system, China should adopt the SIA for ethnic regions while continuing its fight against corruption.

Many of the concepts discussed in this paper are contested, such as sustainability, justice, and even participation. For example, Cooke and Kothari criticize "participatory development's potential for tyranny" as "it can lead to the unjust and illegitimate exercise of power" [76]. On the other hand, Hickey and Mohan argue for transforming problematic traditional practices to citizen participation. The contested nature of the terms shows the complexity of the issues and cautions us to avoid drawing simplistic conclusions [77]. We hope that our report will provide the initial information and stimulate future research into developing an SIA with justice and equity emphasized for easing ethnic conflicts in ethnic regions.

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Author Contributions

Lee Liu designed the research, conducted literature research and fieldwork, and wrote the article; Jie Liu conducted literature research and fieldwork; Zhenguo Zhang conducted fieldwork and cartographic work.

Conflicts of Interest

The authors declare no conflict of interest.

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