Towards collective action in conflict resolution on environmental impacts due to coal mining in Indonesia

S Sudarmo
Department of Public Administration, Faculty of Social and Political Sciences, Universitas Sebelas Maret, Jl Ir. Sutami 36A Surakarta, Jawa Tengah, Indonesia

Corresponding author: sudarmosudarmo1963@gmail.com

Abstract. The Indonesian government has formally determined large-scale coal production to meet economic initiatives. This study uses the documentary method. The study found that coal mining activity has both positive and negative impacts. Coal mining creates environmental damage resulting in conflicts and advantaged and disadvantaged groups. The conflict resolution approach tends to be partial and has not resolved the problems associated with coal mining because the community tends to be victimized. Taking a participatory and inclusive collective action approach is essential to mitigate challenges coal mining entails because environmental problems require diverse stakeholders’ involvement. The commitment of coal mining entrepreneurs and the government’s concrete actions to minimize the negative impacts of coal mining cannot be further delayed which are to ensure the sustainability of Indonesia’s resources, human life, and the natural environment.

1. Introduction
This paper discusses the Indonesian government’s policy to meet energy needs and its consequence on government encouragement for coal exploration. This study also discusses the socio-economic and environmental advantages and disadvantages of coal mining. Furthermore, this study discusses the conflicts that occur due to coal mining and looks for solutions to these conflicts and disadvantages.

The Indonesian government made coal a part of the country’s core energy policy since the late 1970s. Along with economic and population growth, urbanization, industrialization, and lifestyle changes that require more energy, domestic energy needs are increasing. Government Regulation 79/2014 concerning energy policy targeted achievements in the supply and utilization of primary and final energy. Achievement is to be accomplished through the fulfillment of primary energy supply of around 400 million tones (MT) and 1,000 MT of oil equivalent in 2025 and 2050 consecutively [1]. The regulation stipulated that to achieve the target, the role of coal will be at least 30% and 25% of the total primary energy supply in 2025 and 2050 consecutively. These figures show that the Indonesian government still highly places coal in its core energy policy. The policy has continuously encouraged the government to find coal reserves and resources to meet energy needs. As a result, licensing becomes easier with 40.21 percent out of all mining permits in Indonesia being for coal exploration [2]. The continued reliance on coal for energy supply and coal exploration brings about several environmental and human life consequences that may result in conflict.

There were diverse studies of coal mining’s impacts on economic gain and consequences [3–5], physical health problems [6], environmental change and distress [7], deforestation, soil erosion,
landscape destruction, landslides, water-level reduction, and soil pollution [8–10]; and among other diverse life impacts [11,12]. However, none of them includes discussions of conflict resolution through collective actions as the consequence of the environmental effect of coal mining. This paper argues that coal mining provides social and economic benefits but brings about negative environmental impacts resulting in conflicts.

2. Methods
The current study uses the documentary research method. It was conducted using official documents and personal documents as the primary sources of information regarding the trend of coal reserve and resources for exploration, advantages and disadvantages of coal mining, and its environmental impacts. All data were analyzed with the intent to propose solutions to problems and challenges that mitigate coal’s energy benefits.

3. Findings and discussions
The government has continuously encouraged coal production to increase. Recently, the Minister of Energy and Mineral Resources claimed that Indonesia has potential coal resources of 149 billion tons (BT), total coal reserves of 38 BT, and abundant mineral reserves [13]. The government's statement is then used to justify conducting large-scale coal exploration to maximize economic benefits. The Ministry of Energy and Mineral Resources has decided to increase the nation’s coal production target from 550 million tons in 2020 to 625 million tons in 2021; these additional 75 million tons of coal production are for export and not subject to the domestic market obligation sales [14]. Thus, the government encourages coal mining companies to increase their production to achieve the government's target. Massive coal exploration is clearly based on economic motives despite the accompanying negative externalities. The desire to achieve production targets sometimes weakens the government's control over coal mining companies, although they are in the status of non-clear and clean [15].

Coal mining in the short term has positive economic impacts. These include jobs and business opportunities for residents around the mining site [9,16]; increased profits for local residents due to the higher price difference between the sale of land purchased by mining companies than the price of other lands around the mining site [3], even though the actual selling price of land is still very low [12]; increasing local revenue and the local economy [4]. On the negative side, because coal mining attracts migrants to come to work in the company and live for a long time in local boarding houses, this situation encourages prostitution [16]. In addition, after several months or years of operation, mining companies cease their activities, close the site, and leave. Residents around the mining site who have sold their land to the company and become workers in the company immediately lose their jobs and sources of income. In the long run residents will lose out due to steep switching costs once the mining company leaves. Furthermore, the company often recruits workers from outside the area so that job opportunities for residents around mining sites are limited [12].

Coal mining seems very profitable economically because it does not consider negative externalities in the total cost equation. Moreover, illegal coal mining companies are still operating. They do not have permits and documents of environmental impact analysis (EIA) [17]. Even when legal and properly permitted, coal mining causes several negative impacts on the environment and human life—first, the creation of dangerous large holes that are not managed adequately. The extraction of coal deposits has resulted in pits that require land reclamation and re-vegetation as required in the EIA document by mining companies. Otherwise, these holes are quite dangerous for humans; there are at least 168 people died because of hole accidents in the period 2014-2020 [18]. However, reclamation tends to fail because the amount of coal deposit taken out of the mine pit is much larger than the land available to cover it. In fact, many mining companies leave their former mining sites and do not carry out land reclamation and vegetation consistently as required in the EIA document [19]. Second, there are significant changes in the level of soil fertility. Topsoil and subsoil removed for a long time and then put back in the holes result in changes in the soil fertility level because high rainfall reduces or
even eliminates some of the nutrients in the soil needed by plants due to leaching by rainwater [20]. Finally, coal mining causes agricultural production to decline [12]. Third on the list include water and air pollution along with associated health problems. Transporting coal through unpaved roads results in dusty air; similarly the rivers around the mining site are polluted and cause itching; and flying dust causes respiratory problems, especially for children and the elderly [9,12].

The impact of coal mining on the environment ultimately causes conflicts between mining companies and local residents [16,18]. Even some companies with a maximum profit-seeking motive do not have the document of EIA and official permits. The destruction and pollution of the environment are getting out of control [18]. Conflicts between mining companies and residents occur because the distance between the mining site and the residents' settlements are relatively close together so that it disturbs the residents’ interests; community plants are damaged because of being affected by coal mining or land purchased by the company, but they did not receive adequate compensation. Mining companies and/or local governments do not effectively communicate the existence of mining sites to residents [21], and many EIA documents were not made through public consultation because the EIA documents are only a formality to obtain a mining permit from the local government through bribery [22]. These facts show there are differences in interests, goals, excessive economic motives, poor communication, and the absence of citizen involvement in decision making. These failures cause conflicts between coal mining companies, local governments, and community members. Because environmental pollution concerns the shared interests or goals of diverse stakeholders, collective action-based conflict resolution needs to be carried out.

Collective action emphasizes the involvement of a group of people who willingly engage in a mutual action to pursue a common interest or shared goal [23,24]. It can be done openly by a group of members or institutions [25] in the form of activity coordination or information sharing or the development of institutions [24]. Environmental damage is a common problem. Therefore, its solution requires joint actions of various stakeholders involving the government, coal mining entrepreneurs, affected local communities, economists, environmentalists, geologists, and energy and mining experts. They need to meet together in a dialogues forum to define complex problems and look for acceptable problem-solving alternatives to all without creating any new problem.

4. Conclusion
Coal mining has positive economic impacts, but it causes diverse social and environmental effects. Along with coal mining activities, complex problems have arisen that bring about conflicts between stakeholders. A complex problem cannot be solved by mining companies or government alone. Complex problems require collective and inclusive actions involving diverse stakeholders to define problems and find appropriate solutions so that potential destructive conflicts can be directed into constructive ones. Moreover, coal mining activities should involve potentially affected people in decision making or be involved in public consultation so that the EIA document truly reflects the actual situation, not a formality to obtain a permit from the local government. Government officials must also be honest, transparent and should not accept bribes in giving licenses to coal mining entrepreneurs so that good mining practices can be carried out. In the future, to meet national energy needs, the government needs to find a substitute fuel environmentally friendly coal immediately. Also, it is necessary to enforce strict rules and severe sanctions to punish any government official who conducts maladministration in providing license services to coal entrepreneurs. Similarly, any coal entrepreneur who destroys the environment and endangers human life must be punished by revoking their permits, imposing fines, and imprisoning them to create a deterrent effect against future breaches of public confidence and trust.

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