

Research Article

The effectiveness of post-mining land rehabilitation policy in realizing environmental sustainability: Lessons from Sukageuri View, Kuningan, West Java

Suwari Akhmaddhian^{1*}, Toto Supartono², Dikha Anugrah¹, Sarip Hidayat¹, Haris Budiman¹, Erga Yuhandra¹, Wawan Setiawan³

¹ Faculty of Law, Universitas Kuningan, Jl. Cut Nyak Dhien No.36A, Kuningan 45513, Indonesia

² Faculty of Forestry and Environment, Universitas Kuningan, Jl. Cut Nyak Dhien No.36A, Kuningan 45513, Indonesia

³ Environmental Service of Kuningan Regency, Kuningan 45514, Indonesia

*corresponding author: suwari_akhmad@uniku.ac.id

Abstract

Article history:

Received 6 May 2023

Revised 8 July 2023

Accepted 31 July 2023

Keywords:

policy
post-mining land rehabilitation
sustainability

The effective management of natural resources is critical in achieving environmental sustainability, and it requires a careful balance of ecological and economic interests. Therefore, this study analyzed the effectiveness of village government policy in managing post-mining land for environmental sustainability using a non-doctrinal legal approach. Primary data were collected through interviews and observations, while secondary data came from regulations, scientific journals, and papers related to post-mining land rehabilitation governance. The study was conducted in Sukageuri View, Kuningan Regency. The study found that the policy implemented by the Cisantana Village Government in managing post-mining land through the establishment of the Village-Owned Enterprise (VOE) in 2016 has been effective. The area, formerly known as Sukageuri View, is home to various flora and fauna species, with several businesses operating and over 114,000 visitors engaging in social activities in 2022. Additionally, the site has contributed to the village's original income and supported the work program of the Cisantana Village Government. In conclusion, the policy implemented by the Cisantana Village Government effectively balances ecological, social, and economic factors, meeting the criteria for environmental sustainability.

To cite this article: Akhmaddhian, S., Supartono, T., Anugrah, D., Hidayat, S., Budiman, H., Yuhandra, E. and Setiawan, W. 2023. The effectiveness of post-mining land rehabilitation policy in realizing environmental sustainability: lessons from Sukageuri View, Kuningan, West Java. *Journal of Degraded and Mining Lands Management* 11(1):5059-5071, doi:10.15243/jdmlm.2023.111.5059.

Introduction

In accordance with the Republic of Indonesia's 1945 Constitution, the preservation of a sustainable environment is a precious gift that requires utmost effort in utilizing natural resources for the common good. This is essential for achieving a happy life based on the principles of Pancasila (the Indonesian state philosophy) (Dimiyati et al., 2021). To ensure a harmonious, balanced, and sustainable environmental

management that supports eco-friendly development, it is important to pursue sustainability based on integrated and comprehensive national policy while considering the needs of both present and future generations (Zhang et al., 2022). Article 28H of the 1945 Constitution states that a good and healthy environment is the fundamental right of every Indonesian citizen (Akhmaddhian, 2020). The environment's deteriorating quality seriously threatens the survival of people and other living things.

Consequently, environmental protection and management play a crucial role, particularly in the face of increasing global warming and climate change that further exacerbates environmental degradation. Law No. 32 of 2009 concerning Environmental Protection and Management serves as a guideline on permissible and prohibited environmental practices in Indonesia (Barakati et al., 2023). It recognizes that forests, land, air, and water are classified as natural resources, that should be responsibly utilized for the benefit of the community. Non-renewable natural resources, such as minerals, are paramount for human life and development because as a region develops, the demand for mineral resources increases to support its growth and progress (Del-Aguila-Arcentales et al., 2022).

Kuningan Regency, situated in West Java Province, Indonesia, is geographically located between 108°23"-108°47" East Longitude and 6°45"-7°13" South Latitude. It comprises 32 sub-districts, divided into 361 villages and 15 urban neighborhoods, with the central government located in the Kuningan sub-district. The eastern part of the regency is characterized by lowland terrain, while the western part is mountainous, with Mount Ceremai (3,076 m) at its peak (Nasihin et al., 2016). Besides the mining industry, Kuningan Regency is renowned for its flourishing agricultural tourism, concentrated in several areas, including the small villages of Cisantana and Cibuntu (Swantari et al., 2021). These villages have re-purposed post-mining sites into national parks, such as Cisantana and Curug Sawer Parks, which serve as tourist attractions (Harjadi et al., 2021). The transition from mining sites to tourism parks, as part of the bioeconomy, creates tensions associated with economic growth, ecological integrity, and social justice (Halonen et al., 2022).

Accountability, effectiveness, externalities, and national strategic interests are only a few of the criteria used to determine how tasks are distributed among Indonesia's central, provincial, and regency/city governments. The harmony of intergovernmental relations is also taken into account when assigning responsibilities. In managing and utilizing mineral resources, the government cannot solely conduct all activities within the mining sector. The mining industry plays a significant role in generating actually added value for national economic growth and sustainable regional development; hence, the government occasionally needs partners in the shape of commercial firms engaged in mining (Shabarudin and Rahmat, 2022)

In Indonesia, the government acts as a regulator by providing legal frameworks for business entities engaged in managing and utilizing mineral resources. The current form of legality is a Mining Business License (MBL) (Baura et al., 2022). The issuance of this legality in Kuningan Regency is subject to the regional government's authority, which is regulated under Law Number 4 of 2009 concerning Mineral and Coal Mining. With the enactment of Law Number 23

of 2014 concerning Regional Government, significant changes have been introduced regarding the implementation of government affairs in the region, particularly in granting MBL (Ilmi and Imanulah, 2019)

Previous studies have examined the effects of mining on soil nutrient availability for reclamation purposes in the western region of Ghana. The study measured the macro and micronutrients in five reclamation sites and one undisturbed area, and the findings generally suggested that the restoration efforts have been somewhat successful (Adonadaga et al., 2021). Another post-mining management approach was through freshwater aquaculture using *Pangasius* sp., *Channa striata*, and *Oreochromis* sp. in Malinau Regency, North Kalimantan. This method employed turbine and nanobubble technology, including natural-based solutions for wetland and empty basin ecosystem rehabilitation (Christian et al., 2023). Improvement of soil qualities necessitates a drawn-out procedure and creative approaches for nickel post-mining land reclamation. Applying calcite (CaCO₃) and using empty fruit bunches (EFB) as biochar is one potential approach for post-mining land restoration. After nickel mining, using biochar and calcite can significantly improve the pH, available P, organic C, cation exchange capacity, *Mucuna* sp. development, and exchangeable Al content of the soil. Comparing various methods, adding 7.5% biochar by weight of soil and 4.5 t calcite ha⁻¹ yielded the greatest results in enhancing soil fertility and *Mucuna* sp. growth (Jayadi et al., 2022).

Another study conducted on asbestos mine rehabilitation at MABE, Kozani, in northern Greece, stated that the appropriate transformation of land into forest vegetation creates an environment safe from asbestos fibers and provides a sustainable future for post-mining areas as a forest (Ganatsas et al., 2021). Gold mining is a valuable economic activity for countries, providing job opportunities, revenue allocation, and socio-economic development. However, mining activities can lead to land degradation, attributed solely to illegal small-scale mining, known as *galamsey*, and large-scale legal mining. Good environmental regulations and management in this sector help address mining activities' effects on land and water resources (Awotwi et al., 2021). Based on the above description, this study aimed to examine the effectiveness of post-mining land rehabilitation policy in realizing environmental sustainability, specifically in Sukageuri View, Kuningan.

Materials and Methods

A conceptual and case study approach was used in this descriptive research to analyze and address issues in actual settings, which was conducted utilizing a non-doctrinal legal design technique. Data were gathered from primary and secondary sources, with secondary

data coming from evaluations of the literature and theories applied as analytical tools (Salam, 2020). The data collected were evaluated using qualitative descriptive analysis, and the study also relied on mining regulations (Table 1). Other approaches, such as history and law, were also used to collect accurate data (Mohammad et al., 2022). Qualitative data analysis was performed with legal document interpretation techniques during literature studies, which were analyzed analytically and critically. Primary data in the form of observations and interviews were collected with the Head of Cisantana Village, the Chairman of the Cisantana Village-Owned Enterprise, the Head of the Sukageuri View Unit, and the owners of shops, stores, and cafes in Sukageuri View.

The procedure used to identify bird species, which involved listing the types up to a certain number, was the MacKinnon method (Winarni et al., 2022). The observer documented all bird species found up until ten species were gathered. This procedure resulted in a total of ten species being determined for each list. The observer created a new list every time he had ten types, continuing until he had ten more kinds. There were ongoing, recurrent observations. In case

they were discovered during the subsequent observation, the types that were noted on the prior list were written back. With this technique, observations were made by first exploring the research site and then identifying every person located there. When no new species were discovered while being observed, the data collected on this particular bird species was deemed to be suitably representative.

The method used for plants was the quadrat sampling technique with single and sub-plots arranged systematically (Wibisono and Azham, 2017). There were thirty plots strategically placed, each measuring twenty meters by twenty meters in size. Each individual tree in the sample plots that had a diameter of at least five centimeters had its species name and the number recorded. Along with woody plants, bananas, the palm and fern families, and other plants were also noted.

This study was conducted from February 1st to 18th, 2023, in Cisantana Village (Figures 1 and 2), specifically on the 35-hectare post-mining area geographically located at S 6°56'57.9" and E 108°26'43.2" (Kehutanan dan Lingkungan Hidup, 2017).

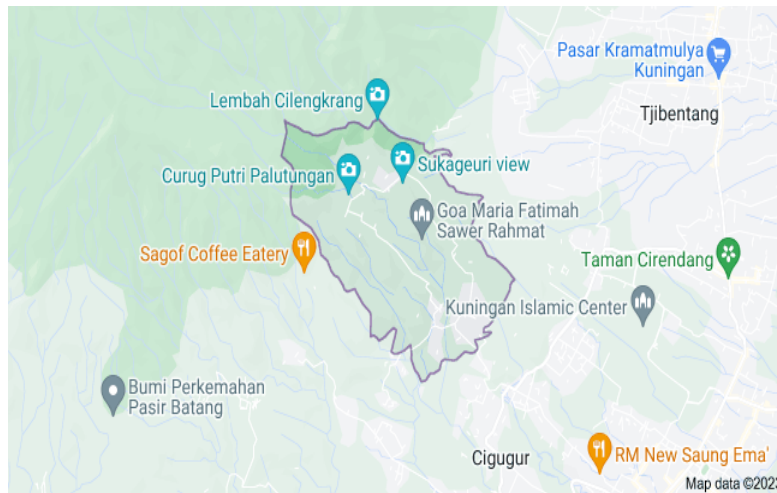


Figure 1. Map of Sukageuri View Cisantana Village, Kuningan, West Java.

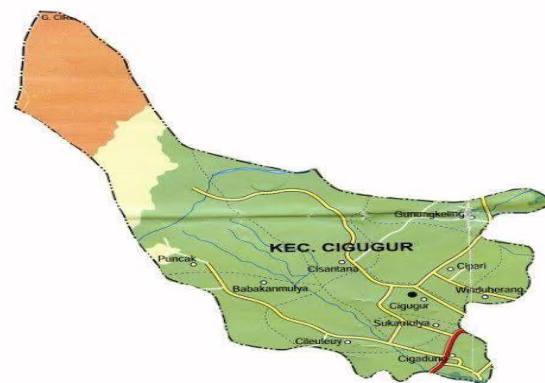


Figure 2. Map of Cisantana Village, Cigugur, Kuningan Regency, West Java.

Table 1. List of mining regulations for minerals and coal.

No	Mineral and Coal Mining Regulations
1	The 1945 Constitution.
2	Law Number 32 of 2009 concerning Environmental Protection and Management.
3	Law Number 6 of 2014 concerning Villages
4	Law Number 23 of 2014 concerning Regional Government.
5	Law Number 4 of 2009 concerning Mineral and Coal Mining
6	Law Number 3 of 2020 concerning Amendments to Law Number 4 of 2009 concerning Mineral and Coal Mining
7	Government Regulation Number 78 of 2010 concerning Reclamation and Postmining Reclamation and Postmining for IPR Holders
8	Government Regulation Number 22 of 2021 concerning the Implementation of Environmental Protection and Management
9	The Minister of Energy and Mineral Resources Regulation Number 26 of 2018 concerning the Implementation of Good Mining Principles and Supervision of Mineral and Coal Mining
10	West Java Regional Regulation Number 2 of 2017 concerning Mineral and Coal Mining Management
11	Regional Regulation of Kuningan Regency Number 11 of 2015 concerning Organizational Structure and Working Procedures of Village Government
12	Cisantana Village Regulation Number 28 of 2016 concerning the Village-Owned Enterprises Village-Owned Enterprises

Results and Discussion

Regulations of government authority in postmining land rehabilitation

There are two concepts of the rule of law, namely, Rechtsstaat and the rule of law itself. Rechtsstaat is known in continental European states, while the rule of law is usually applicable in Anglo-Saxon states and among common law followers in England (Muslih, 2013). In the sense of the rule of law, the state should possess at least three characteristics, including the supremacy of law, equality before the law, and the guarantee and mechanism for the protection of rights through due process (Muabezi, 2017). According to Andrews (1978), agreement on common aims or ambitions, agreement on the rule of law as the cornerstone of governmental or state administration, and agreement on the structure of institutions and constitutional procedures are the pillars of constitutionalism as the rule of law (Djafar, 2016). According to Law Number 23 of 2014 on regional government, within the framework of the unitary state of the Republic of Indonesia, the regional government focuses on the administration of governmental affairs, while the regional parliament is based on the principles of autonomy and task allocation with the greatest degree of autonomy (Fauzi, 2019).

The policy is defined as a series of concepts and principles that serve as the outline and foundation of a plan for carrying out a task, leadership, and action. Additionally, it is a statement of goals, principles, and guidelines for management in an effort to achieve specific objectives (Hamzah, 2019). Friedrich (1971) asserted that a policy is a set of initiatives put out by an individual, a group, or a government in a specific setting where opportunities and risks are already present. By utilizing the potential and removing

barriers, the suggested strategy hopes to accomplish particular objectives (Akhmaddhian et al., 2021).

Article 1 of Law Number 4 of 2009 concerning mineral and coal mining states that all operations involving the management, management, and exploitation of minerals or coal are included in the definition of mining. This covers general inquiry, exploration, feasibility studies, construction, mining, processing and refining, transportation, and sales, along with post-mining activities. The exploitation of minerals or coal is described in Article 6 as including all phases, including general inquiry, exploration, feasibility studies, construction, mining, processing and refining, transportation, sales, and post-mining operations. According to Article 1 Paragraph (27), post-mining is a planned, organized, and ongoing operation that continues after some or all mining exercises have been completed. It aims to return the area's natural environmental, social, and economic functions in conformity with regional circumstances.

The government regulations concerning post-mining land rehabilitation are governed by legislation at various levels, including the constitution, laws, government, ministerial, regional, and governor regulations. Based on the 1945 Constitution, Article 20A paragraph (1), the parliament performs legislative, budgetary, and supervisory functions. Furthermore, Article 22D paragraph (3) stipulates that the regional parliament may oversee the implementation of laws related to regional autonomy, establishment, and expansion of regions, center-region relations, natural resource management, economic resources, state budgets, taxes, education, and religion. The results of this oversight were submitted to the parliament for further action in 2021. Every citizen has the right to a successful life, physical and mental well-being, access to housing in a pleasant and healthy

environment, and the right to receive health services, according to Article 28H paragraph (1). According to Article 33, paragraphs (2) and (3), the state is in charge of key production sectors for the nation, which greatly impacts how many people make a living. The state owns the surrounding lands, waters, and natural resources, which are used for the populace's benefit. Article 33, paragraph (4) states that the national economy is based on economic, democratic ideals of solidarity, efficiency with justice, sustainability, environmental awareness, and self-reliance while preserving a balance between development and national economic unity.

Law Number 4 of 2009 concerning mineral and coal mining governs various aspects of mineral and coal mining operations. According to Article 6 (1), the authorization of the government in managing mineral and coal mining includes supervision and guidance on post-mining land reclamation. Article 7 (1) stated that the provincial government is also responsible for managing mineral and coal mining, including supervision and guidance on post-mining land reclamation. Similarly, Article 8(1) specified that the regency/city government is responsible for supervising and guiding post-mining land reclamation. Article 39(2) highlights that MBL for production operations, as mentioned in Article 36(1)(b), should contain provisions on environmental aspects, including post-mining land reclamation, as well as funds for its reclamation and guarantee.

Article 73(2) designated the regency/city government as responsible for ensuring technical security in mining activities, encompassing occupational health and safety, environmental management, and post-mining activities. According to Article 79, the special mining business license (SMBL) for production operations, as referred to in Article 76(1)(b), should contain provisions on environmental aspects, including post-mining land reclamation, along with funds for reclamation and post-mining guarantee. Lastly, Article 96 mandated that holders of both MBL and SMBL must adhere to good mining technical rules, encompassing (a) mining occupational health and safety provisions, (b) mining operational safety, (c) management and monitoring of the mining environment, including post-mining activities, (d) conservation of mineral and coal resources, and (e) appropriate management of mine waste in solid, liquid, or gas form until it meets environmental quality standards before being released into the environment.

Article 79 stated that SMBL for production operations, as mentioned in Article 76 paragraph (1) letter b, should contain provisions for environmental management, including reclamation and post-mining activities, a guarantee fund for reclamation and post-mining. Article 96 required holders of MBL and SMBL to implement good mining technical principles, including (a) provisions for occupational health and safety in mining, (b) mining operation safety, (c)

management and monitoring of the mining environment, including reclamation and post-mining activities, (d) conservation of mineral and coal resources, and (e) management of mine residue from mining activities in solid, liquid, or gaseous form until it meets environmental quality standards before being released into the environment.

Article 99 states that (1) when applying for an MBL or SMBL production operation, every holder must submit reclamation and post-mining plans, (2) these activities must be carried out in accordance with post-mining land designation, and (3) post-mining land designation referred to in paragraph (2) must be stated in land use agreement between MBL or SMBL and land rights holders. Article 100 stipulates that (1) every holder of an MBL and SMBL is expected to provide reclamation and post-mining guarantee funds. (2) assuming the holder of MBL or SMBL fails to carry out reclamation and post-mining activities in accordance with the approved plan, the minister, governor, or regent/mayor may designate a third party to carry out these activities with the guaranteed funds as referred to in paragraph (1), (3) the provisions in paragraph (2) apply when the holder of MBL or SMBL fails to carry out the reclamation and post-mining activities according to the approved plan.

Article 101 stipulates that the government will determine further regulations related to reclamation and post-mining activities, as mentioned in Article 99, as well as reclamation and post-mining guarantee funds, as referred to in Article 100. According to Article 124(3), mining services include consultation, planning, implementation, and testing of equipment in general exploration, exploration, feasibility studies, mining construction, transportation, mining environmental, post-mining and reclamation, and occupational health and safety. As stated in Article 141 (1), the supervision mentioned in Article 140 includes the management of environmental, reclamation, and post-mining activities. Additionally, Article 101 states that provisions related to reclamation and post-mining guarantee funds specify the amount, procedures for depositing and withdrawing, and reporting the use of the guarantee funds.

Law Number 33 of 2009 concerning environmental protection and management specifies the regulations for supervision in Article 71. According to paragraph (1), the minister, governor, or regent/mayor is obliged to supervise the compliance of businesses or related activities as well as ensure they are in accordance with the provisions stated in the laws and regulations related to environmental protection and management. Paragraph (2) allows the minister, governor, or regent/mayor to delegate their authority to technical officials or agencies responsible for supervising environmental protection and management. Furthermore, paragraph (3) requires the appointment of environmental supervisors by the minister, governor, or regent/mayor, who are perceived as functional officials in supervising. Article

72 of the law states that the minister, governor, or regent/mayor, following their authority, is obliged to supervise the compliance of the responsible parties involved in business and related activities with environmental permits (Hasyim and Mardhatillah, 2020).

Article 74 (1) of Law Number 33 of 2009 concerning environmental protection and management defines the authority and duties of environmental supervisors as follows (1) environmental supervisors appointed under Article 71 paragraph (3) are authorized to monitor, request information, make copies of necessary documents and take notes, enter a specific location, take photographs, make audio-visual recordings, take samples, inspect the equipment, inspect installations and transportation facilities, as well as stop certain violations, (2) environmental supervisors may coordinate with civil servant investigator officials in carrying out their duties, and (3) the party responsible for businesses and related activities is prohibited from obstructing the implementation of the duties of the environmental supervisor (Kumandhani, 2021).

In Law Number 6 of 2014 concerning villages, Article 1 (1) defines a village as a legal community unit with a designated territory that regulates and manages government affairs based on community initiatives and ancestral and recognized traditional rights. The village government, as stated in Article 1 (2), is responsible for implementing governance affairs and addressing the local community's interests within the Indonesian governance system. This parastatal comprises the village head and other village apparatus, as Article 1 (3) mentions. Additionally, village regulations discussed and agreed upon by the village head and the village consultative body are enacted legislative acts, as stated in Article 1 (7).

Law Number 6 of 2014 concerning villages, in accordance with Article 26, states that (1) the village head is responsible for organizing village government, implementing village and community development, as well as empowerment initiatives, and (2) carrying out these tasks as referred to in paragraph (1), the village head has the authority to (a) lead the implementation of village government, (b) appoint and dismiss village apparatus, (c) manage village finances and assets, (d) establish village regulations, e. determine the village budget, (f) foster community life in the village, (g) maintain peace and order in the village, (h) develop and improve the economy of the village to achieve a productive-scale economy for the maximum welfare of the community, (i) develop village income sources, (j) propose and receive the transfer of a portion of state wealth to improve the welfare of the Village community, (k) develop the socio-cultural life of the village community, (l) utilize appropriate technology, (m) coordinate participatory village development, (n) represent the village in and outside the court or appoint legal representatives following the provisions of laws and regulations, and (o) exercise other authorities as

stipulated by laws and regulations. Law Number 23 of 2014 concerning regional governments, in relation to Article 8 (1), states that the supervision and guidance of government affairs by the provincial region, as referred to in Article 7 paragraph (1), shall be carried out by the minister or head of non-ministerial government institutions. (2) Meanwhile, the government affairs supervision and guidance by the regency/city region, as referred to in Article 7 paragraph (1), shall be carried out by the governor, who represents the central government. Article 373 (1) of the same law states that the central government is responsible for conducting supervision and guidance on the implementation of regional government by the provincial region. (2) The governor, who represents the central government, is responsible for conducting supervision and guidance on the implementation of regional government by the regency/city region (Setiawan, 2018). It is worth noting that the Attachment to Law Number 23 of 2014 concerning regional governments, the division of concurrent government affairs between the central government and provincial and regency/city regions, the division of government affairs in the energy and mineral resources sector, the mineral and coal sector does not involve authorized supervision to be carried out by the regency/city regional government (Putri and Wicaksono, 2016).

Law Number 3 of 2020, an amendment of Law Number 4 of 2009 concerning mineral and coal mining, Article 1 number (1) defines mining as a set of activities encompassing the study, management, and exploitation of minerals or coal. These include general investigation, exploration, feasibility studies, construction, mining, processing, refining, transportation, sales, and post-mining activities. The 2009 Law concerning mineral and coal mining, Article 1 number (29), defines mining areas, referred to as MA (Firmansyah and Sugiarto, 2020), as a region with mineral or coal potentials, not bound by government administrative boundaries and included in the national spatial planning. Meanwhile, Article 1 number (32) of Law Number 4 of 2009 concerning mineral and coal mining states that the mining area of the people, referred to as PMA, is a part of the MA where small-scale mining activities are conducted. Article 1 number (6) clarifies that mining activities include the stages of general investigation, exploration, feasibility studies, construction, mining, processing, refining, transportation, sales, and post-mining activities.

Law Number 3 of 2020, on the amendment to Law Number 4 of 2009 concerning mineral and coal mining, provides a categorization of mining activities into mineral and coal mining. Mineral mining is further divided into four categories (Bujani et al., 2022), namely (a) radioactive minerals such as radium, thorium, and uranium, (b) metallic minerals including gold and copper, (c) non-metallic minerals like diamond and bentonite, and (d) rocks such as andesite, clay, fill soil, gravel, fill sand. According to Article

161B (1) of Law Number 3 of 2020, individuals whose MBL or SMBL have been revoked or expired and fail to carry out (a) reclamation or post-mining activities, as well as (b) the placement of reclamation or post-mining guarantee funds, may face a maximum imprisonment of five years and a fine of relatively IDR 100,000,000,000.00 (one hundred billion rupiahs). (2) In addition to the criminal sanctions mentioned in paragraph (1), former holders of MBL or SMBL may also be subject to additional penalties requiring the payment of funds to implement reclamation and post-mining obligations.

Based on Government Regulation 78 of 2010 concerning reclamation and post-mining for MBL holders, Article 44(1) states that the regency/city government must prepare reclamation and post-mining plans for each small-scale mining area before issuing an MBL. (2) The reclamation and post-mining plans, as referred to in paragraph (1), are prepared based on environmental documents approved by the authorized agency following the provisions of laws and regulations in environmental protection and management. Article 45(1) states that the regent/mayor determines the reclamation and post-mining plans, as referred to in Article 44 for MBL holders. (2) Both MBL holders and the regent/mayor are obliged to engage in reclamation and post-mining activities following the determined plans as referred to in paragraph (1).

Government Regulation Number 22 of 2021 concerning the implementation of environmental protection and management in Article 472, paragraph (1) defined guarantee funds for the restoration of environmental functions as finance provided by environmental approval holders for the restoration of polluted or damaged environmental quality due to their activities. It can take the form of reclamation, post-mining guarantee funds, waste management insurance, or other nomenclatures according to the relevant legislative and technical sector provisions. Minister of Energy and Mineral Resources Regulation Number 26 of 2018 concerning the implementation of good mining practices and supervision of mineral and coal mining, Article 22 regulates reclamation and post-mining and post-operation. Under Article 22 (1), Exploration MBL and SMBL holders must submit plans and carry out exploration reclamation following environmental documents (Widodo and Pranandita, 2022)

In West Java, Regional Regulation Number 2 of 2017 concerning the management of mineral and coal mining, in accordance with Article 57, states the regulations regarding reclamation and post-mining guarantees. According to paragraph (1), MBL holders are responsible for financing reclamation and post-mining guarantees for exploration and production operations through the reclamation and post-mining guarantee schemes. Furthermore, paragraph (2) emphasizes that the budget plan for exploration and production operations should include reclamation and

post-mining guarantee provisions. Administrative sanctions are addressed in Article 80, while criminal sanctions for MBL holders are stated in Article 82. In Kuningan Regency, Regional Regulation Number 11 of 2015 pertains to the village government's organizational structure and work procedures. According to Article 1(9), Village regulations are legislations enacted by the village head after discussing and agreeing with the village consultative body. Article 8 (1) highlights the responsibilities of the village head in implementing the village government, conducting village and community development, and empowering the village community. (2) In carrying out the tasks as referred to in paragraph (1), the village head has the authority to manage the village's finances and assets and establish village regulations.

Cisantana Village Regulation Number 28 of 2016 concerning the VOE, in accordance with Article 1 (6), states the name and position. (1) The VOE is named the Cisantana. (2) The VOE, as mentioned in paragraph (1), is located in Cisantana Village. Village government refers to the village head or another appointed official, assisted by other members of the village apparatus. In Indonesia, it is responsible for administering governmental affairs and serving the local community's interests within the system. The VOE is a business entity where the village owns all or a majority of its capital through direct participation from the separated assets. The purpose of the VOE is to manage assets, provide services, and conduct other business activities to achieve maximum community welfare.

Cisantana Village Regulation Number 28 of 2016 concerning village-owned enterprises in Article 2, regulated the Name and Position (1) This village-owned enterprise is named Cisantana VOE, and (2) it is located in Cisantana Village as referred to in paragraph (1). According to Article 3, establishing the VOE aims to accommodate all economic and public service activities managed by the village and inter-village cooperation. Furthermore, Article 4 outlines the following objectives for the establishment of the VOE such as (a) improving the economy of the village, (b) optimizing village assets for community welfare, (c) enhancing community initiatives in managing the economic potentials of the village, (d) developing cooperative business plans between villages or with third parties, (e) creating opportunities and market networks that support the needs of public services for residents, (f) generating employment opportunities, (g) enhance community welfare through improved public services, economic growth, and equitable distribution in the village, and (h) increasing the income of the village community and its original income.

Whereas based on the rule of law theory, namely government management based on statutory regulations that the authority of the village government in the rehabilitation of post-mining land in Sukageuri View is based on laws and regulations including the 1945 Constitution, Law Number 32 of 2009

concerning environmental protection and management, Law Number 6 of 2014 concerning villages, Law Number 23 of 2014 concerning regional government, Law Number 23 of 2014 concerning regional government, Law Number 4 of 2009 concerning mineral and coal mining, Law Number 3 of 2020 concerning Amendments to Law Number 4 of 2009 concerning mineral and coal mining, Government Regulation Number 78 of 2010 concerning reclamation and postmining reclamation and postmining for IPR Holders, Government Regulation Number 22 of 2021 concerning the implementation of environmental protection and management, The Minister of Energy and Mineral Resources Regulation Number 26 of 2018 concerning the implementation of good mining principles and supervision of mineral and coal mining, West Java Regional Regulation Number 2 of 2017 concerning mineral and coal mining management, Regional Regulation of Kuningan Regency Number 11 of 2015 concerning organizational structure and working procedures of village government, Cisantana Village Regulation Number 28 of 2016 concerning the village-owned enterprises, so that based on the principle of regional autonomy, village governments are given authority based on statutory regulations to make policies based on the potential that exists in their respective regions.

The effectiveness of Cisantana Village Government policy in postmining land rehabilitation in realizing environmental sustainability

A policy is described as a set of principles and concepts that guide planning and decision-making to achieve specific goals. According to Friedrich (1971), policy involves proposing actions that consider the opportunities and challenges present in a particular context to leverage potential and overcome obstacles to achieve desired outcomes (Satria, 2020). Legislative authority can be granted through attribution, delegation, or mandate (Herman and Muin, 2018). According to Van Wijk and Konijnenbelt (1988), attribution involves assigning governance authority to a government body by the legislature, while delegation transfers authority from one government body or official to another through legal regulations (Asmar, 2017). According to Kettner et al. (2016), program evaluation can be considered effective when it meets certain criteria. These include the government's effort in implementing the program to achieve its intended objectives, the cost efficiency of the implementation of the program, the comparison of program results with predetermined outcomes, the cost-effectiveness of the program in terms of resources expended to achieve objectives, and its direct impact on the community (Mayasoni, 2022).

The extraction of minerals in forest areas, also known as mining activities, has a detrimental impact on the forest ecosystem. Therefore, a comprehensive approach should be taken to effectively manage post-

mining forest land, including land clearing, topsoil spreading, mine waste processing, and land rehabilitation (reclamation and revegetation). Ecosystem restoration efforts must focus on land reclamation, soil erosion and sedimentation control, and land revegetation. The success of these efforts is assessed based on land reclamation performance, soil erosion, and sedimentation levels, and land revegetation progress, such as planting area, plant growth percentage, plant species, the composition of fast-growing and long-lived plant species, and overall plant health (Sudarmadji et al., 2021).

Tropical forests are one of the most diverse ecosystems in the world, with vast biodiversity. Unfortunately, the expansion of open-pit mining activities has led to significant degradation of forested land, leading to the need for science-based practices to reclaim their functions (Kopnina et al., 2022). This study provided an overview of coal mining practices, including regulatory aspects and reclamation obligations, in various locations with different land characteristics and post-mining landscape reclamation efforts in Indonesia. The regulations issued took into account the differences between mining areas within and outside forest areas, particularly with regard to licensing and the assessment of reclamation success. The study explained the coal mining process, starting from land clearing and continuing with the storage of topsoil and overburden materials. Proper handling of materials with the potential to form acid is crucial to prevent acid mine drainage. During the reclamation phase, study findings and field applications for re-establishing topsoil and soil material were presented, along with strategies for controlling acid mine drainage and erosion and managing drainage systems, sedimentation ponds, and mining lakes (Feng et al., 2022). Various post-mining land reclamation efforts and their success rates are highlighted, showing that degraded land can be restored to provide valuable ecosystem services and goods (Peters et al., 2023). Science-based best management practices for reforesting post-coal mining land were developed to promote successful reclamation and forest restoration. These included planting valuable hardwood trees, improving tree survival and growth rates, and applying appropriate tree-planting techniques to accelerate the formation of forest habitats. Monitoring and evaluation are also important, as corrective measures can be taken considering the varying success rates for different site characteristics (Narendra et al., 2021).

Sustainable development must be prioritized in Indonesia to maintain national stability and unity. Abdoellah (2017) stated several measures that need to be taken to achieve this goal. Firstly, all stakeholders must commit to mainstreaming sustainable development and ensuring political commitment (Mangukiya and Sklarew, 2023). Secondly, establishing a sustainable development council is essential to plan, monitor, evaluate, and assist in implementing sustainable development goals. Thirdly,

government programs related to development agendas should be supervised and controlled with the involvement of all community components. Fourthly, stakeholders should work together synergistically to achieve sustainable development goals. Lastly, environmental aspects should be integrated into development, prioritizing sustainable development (Opoku et al., 2022).

Sustainable development is about improving human productivity without harming society or the environment (Larbi, 2023). It involves progressive socio-economic improvement while respecting ecological carrying capacity and achieving human well-being without exceeding the capacity of the earth for resource regeneration and waste absorption. The concept of sustainable development emphasizes the balanced relationship between economic, ecological, and social issues in decision-making (Smith et al., 2022).

Communities face challenges when their social, economic, and environmental resources become depleted or damaged. Since these resources are interconnected, integrated solutions are needed to address seemingly diverse problems such as disease, child abuse, crime, injustice, a weakened economy, energy shortages, lack of decent jobs, species extinction, poverty, deforestation, pollution, family breakdown, armed conflict, or nuclear accidents. However, taking action based on the interdependence of economic, environmental, and social justice elements requires a new way of thinking and taking systemic actions. This creates a future where human society and nature can coexist for mutual benefit and eliminate suffering caused by poverty and the misuse of natural resources (Flint, 2013). Based on research findings, the Sukageuri View tourism object is used by

the community for social activities in various activities from 2019 to 2022, namely 92,110 in 2019, 120,752 in 2020, 113,635 in 2021, and 114,009 in 2022 (Table 2). The refreshing, reunion, "arisan", family gatherings, community activities, and traveling to Sukageuri View can strengthen social cohesion and create community peace.

Table 2. Data of tourists to Sukageuri View.

No	Year	Total	Activity
1	2022	114,009	Refreshing, Reunion, Rotating Savings, Family Gathering
2	2021	113,635	Refreshing, Reunion, Rotating Savings, Family Gathering
3	2020	12,752	Refreshing, Reunion, Rotating Savings, Family Gathering
4	2019	92,110	Refreshing, Reunion, Rotating Savings, Family Gathering

Cisantana Village, 2019 to 2022.

Based on research findings, the Sukageuri View tourism object economically involves the community with 15 (fifteen) business units that contribute to improving the economy (Table 3) and contributions to the Cisantana Village revenue and expenditure budget from 2019 to 2022 (Table 4). The contribution of the Sukageuri View tourist attraction to improving the community's economy is needed to support efforts to increase people's welfare in accordance with state goals.

Table 3. Data of business unit in Sukageuri View.

No	Name	Product	Employee
1	Cisantana Village Owned Enterprise	Tourism, drinking water, and waste management services	8 employees
2	Sukageuri View	Tourism Services	78 employees
3	Warung Abah	Rice, side dishes, noodles, coffee, fried foods, firewood	3 employees
4	Warung Putra-Putri	Noodles, coffee, meatballs, chicken noodles	1 employee
5	Warung Baso Katineung	Meatballs, chicken noodles, coffee, snacks	2 employees
6	Warung Al-Shafa	Meatballs, chicken noodles, <i>seblak</i> , snacks, chicken package	2 employees
7	Kantin Zahwa	Smashed chicken, noodles, and drinks	2 employees
8	Warung Merlin	Tent rental, meatballs, <i>seblak</i> , smashed chicken	1 employee
9	Outdoor	Camping equipment rental	2 employees
10	Sahada Rizkia	<i>Kupat tahu</i> , fried rice, lengko rice, drinks	2 employees
11	Warung Mamah Qita	Boiled noodles, meatballs, coffee, and snacks	2 employees
12	Warung Sukageri Ibu Titin	Noodles, rice, fried foods, and drinks	2 employees
13	Kedai Wadang Jahe Ibu Elly	Ginger drinks and various snacks	2 employees
14	Warung Mang Ira	Noodles, rice, coffee	2 employees
15	Raga Kopi Kuningan	Coffee, various foods	2 employees

Sukageuri View, Kuningan, 2023.

Table 4. Data of Sukageuri View's contribution to the Cisantana Village budget.

No	Year	Amount
1	2022	IDR 53,230,369
2	2021	IDR 50,438,001
3	2020	IDR 73,249,172
4	2019	IDR 48,413,926

Cisantana Village, 2019 to 2022.

Based on research findings on the Sukageuri View tourism object, ecologically, there are 27 types of flora (Table 5) and 15 types of fauna (Table 6). Regional development must adopt the concept of sustainable development so that economic and ecological interests go hand in hand and have a good social impact on the wider community.

Table 5. Data of flora in Sukageuri View.

No	ID name	Scientific name	Total
1	Pinus	<i>Pinus merkusii</i>	13
2	Akasia	<i>Acacia mangium</i>	7
3	Sengon	<i>Albizia chinensis</i>	4
4	Alpukat	<i>Persea americana</i>	17
5	Jati Putih	<i>Gmelina Arborea</i>	42
6	Kaliandra Merah	<i>Calliandra calothyrsus</i>	12
7	Karet Kebo	<i>Ficus elastica</i>	4
8	Kersen	<i>Muntingia calabura</i>	8
9	Angsana	<i>Pterocarpus indicus</i>	1
10	Mangga	<i>Mangifera indica</i>	3
11	Mahoni	<i>Swietenia mahagoni</i>	3
12	Cemara	<i>Casuarinaceae</i>	1
13	Surai	<i>Trema orientale</i>	8
14	Bintinu	<i>Melochia umbellata</i>	41
15	Totongoan	<i>Debregeasia longifolia</i>	3
16	Salam	<i>Syzygium polyanthum</i>	1
17	Ketapang Mini	<i>Terminalia mantaly</i>	7
18	Lamtoro	<i>Leucaena leucocephala</i>	9
19	Lengkeng	<i>Dimocarpus longan</i>	3
20	Ficus Ampelas	<i>Ficus ampelas K.D. Koenig ex Roxb.</i>	1
21	Kiara Beas	<i>Ficus sundaica</i>	2
22	Hamerang Putih	<i>Ficus padana</i>	1
23	Suren	<i>Toona sureni</i>	3
24	Nangka	<i>Artocarpus heterophyllus</i>	1
25	Pisang	<i>Musa sp.</i>	3
26	Pakis Haji	<i>Dicksonia squarrosa</i>	4
27	Sawit	<i>Elaeis guineensis</i>	2

Sukageuri View, Kuningan, 2023.

The effective management of post-mining land rehabilitation policy must consider ecological, social, and economic aspects to ensure sustainability, justice, and community well-being (Figure 3).

Table 6. Data of fauna in Sukageuri View

No	ID name	Scientific name	Total
1	Alap-Alap Sapi	<i>Falco moluccensis</i>	1
2	Bubut Alang-Alang	<i>Centropus bengalensis</i>	2
3	Kedasi Hitam	<i>Surniculus lugubris</i>	1
4	Walet Linci	<i>Collocalia linchi</i>	9
5	Cekakak Jawa	<i>Halcyon cyanoventris</i>	1
6	Layang-Layang Batu	<i>Hirundo javanica</i>	3
7	Layang-Layang Rumah	<i>Delichon dasypus</i>	6
8	Cucak Kutilang	<i>Pycnonotus aurigaster</i>	21
9	Merbah Corok-Corok	<i>Pycnonotus simplex</i>	4
10	Pelanduk Bukit	<i>Trichastoma pyrrogenys</i>	3
11	Perenjok Padi	<i>Prinia inornata</i>	2
12	Cinenen Pisang	<i>Orthotomus sutorius</i>	4
13	Burung-Madu Sriganti	<i>Cinnyris jugularis</i>	2
14	Burung-Gereja Erasia	<i>Passer montanus</i>	15
15	Srigunting Kelabu	<i>Dicrurus leucophaeus</i>	2

Sukageuri View, Kuningan, 2023.

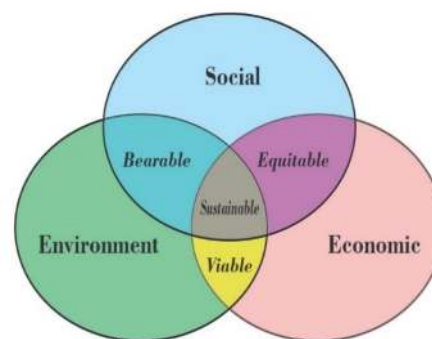


Figure 3. Sustainability model (Flint, 2013).

The Village Government of Cisantana implemented such a policy in 2016, creating the Cisantana Village-Owned Enterprise (VOE) as a business unit under the Village Government of Cisantana to manage the post-mining area named Sukageuri View. By 2023, this area has transformed into a tourist destination with 27 flora and 15 fauna species present, and it has attracted 15 businesses to operate within its boundaries. Additionally, 114,009 visitors engaged in social activities in Sukageuri View in 2022, resulting in IDR 53,230,369 of original income for the village and supporting its work programs. This success

demonstrated that proper post-mining land rehabilitation management policy led to ecological, social, and economic benefits and improved the well-being of local communities. The management of the post-mining area as Sukageuri View tourist attraction is in line with the Flint Sustainability Model, which emphasizes the interrelated aspects of environment, society, and economy. It is also in line with the concept of sustainable development, which advocates for the utilization of natural resources for the benefit of society while preserving them for future generations. The principles of sustainable development require that natural resources be managed to balance environmental, social, and economic considerations. The management of natural resources should be based on the principles of justice, community well-being, and human rights to natural resources. Therefore, managing the Sukageuri View post-mining area, which has become a tourist attraction and contributed to the income of the village, is an excellent example of how post-mining areas can be rehabilitated and utilized sustainably and beneficially.

Conclusion

In conclusion, the success of the policy for post-mining land rehabilitation management in Cisantana Village has shown the importance of sustainable development and the Flint Sustainability Model in achieving a balance between environmental, social, and economic considerations. Implementing the policy by establishing Sukageuri View as a tourist attraction has positively impacted environmental and social interactions within the community and economic growth in the area. The continued support and development of Sukageuri View are necessary to ensure the long-term effectiveness of policy in preserving the environment, improving the well-being of the community, and contributing to economic growth. This case study highlights the importance of sustainable development and the need for integrated approaches to natural resource management to achieve the well-being of communities while preserving the environment.

Acknowledgments

The authors are grateful to the Study and Community Service Institution of Kuningan University for funding this study through the Study Budget for the year 2023 with Number 032/LPPM.PM/UNIKU/2023, Environmental Agency of Kuningan Regency, the Cisantana Village Government, the Cisantana VOE, and all parties who participated and assisted with the study activities.

References

Abdoellah, O.S. 2017. Sustainable development in Indonesia: At the crossroads. Gramedia Pustaka Utama Press (in Indonesian).

- Adonadaga, M., Sambil-Kolong, S. and Ampadu, B. 2021. Effectiveness of post-mining rehabilitation activities at restoring macro and micronutrients to degraded mine sites in the Western Region of Ghana. *British Journal of Environmental Sciences* 9(4):54-66, doi:10.37745/bjes.2013.
- Akhmaddhian, S. 2020. Discourse on creating a special environmental court in Indonesia to resolve environmental disputes. *Bestuur* 8(2):129-138, doi 10.20961/bestuur.v8i2.42774.
- Akhmaddhian, S., Supartono, T., Yuhandra, E., Budiman, H. and Rahmat, D. 2021. The government policy on the Covid-19 handling viewed from environmental and biodiversity perspectives. *IOP Conference Series: Earth and Environmental Science* 819(012044):1-5, doi:10.1088/1755-1315/819/1/012044.
- Andrews, W.G. 1978. The constitutional prescription of parliamentary procedures in Gaullist France. *Legislative Studies Quarterly* 3(3):465-506.
- Asmar, A.R. 2017. Balance funds in the distribution of central and regional government affairs. *Jurisprudentie* 4(2):1-10, doi:10.24252/jurisprudentie.v4i2.4038 (in Indonesian).
- Awotwi, A., Anormu, G.K., Quaye-ballard, J.A., Annor, T., Kwadwo, I., Odai, S.N., Arhin, E. and Gyamfi, C. 2021. Impact of post-reclamation of soil by large-scale, small-scale and illegal mining on water balance components and sediment yield: Pra river basin case study. *Soil & Tillage Research* 211(March):105026, doi:10.1016/j.still.2021.105026.
- Barakati, K.P., Adjii, T.N. and Rahardjo, N. 2023. Status of groundwater and river water quality around the location of illegal gold mining activities in Lantung District, Sumbawa. *Journal of Degraded and Mining Lands Management* 10(3):4433-43, doi:10.15243/jdmlm.2023.103.4433.
- Baura, L., Saptanno, M.J. and Pietersz, J.J. 2022. Regional government authority in managing coal mineral mining *Pattimura Legal Journal* 1(1):167-188, doi:10.47268/pela.v1i1.6753 (in Indonesian).
- Bujani, M., Tangkudung, F. and Lambonan, M. 2022. Permit to use smelter by freeport Indonesia limited liability company according to Law Number 3 of 2020 concerning mining. *Lex Administratum* 10(2):1-15 (in Indonesian).
- Christian, Y., Afandi, A., Prabowo, B. and Rikardi, N. 2023. The feasibility of converting ex-coal mining void into aquaculture in North Kalimantan. *Journal of Degraded and Mining Lands Management* 10(2):4143-4153, doi:10.15243/jdmlm.2023.102.4143.
- Del-Aguila-Arcenales, S., Alvarez-Risco, A., Jaramillo-Arévalo, M., De-La-cruz-diaz, M. and de las Mercedes Anderson-Seminario, M. 2022. Influence of social, environmental, and economic sustainable development goals (SDGs) over continuation of entrepreneurship and competitiveness. *Journal of Open Innovation: Technology, Market, and Complexity* 8(2):73, doi:10.3390/joitmc8020073.
- Dimiyati, K., Nashir, H., Elviandri, E., Absori, A., Wardiono, K. and Budiono, A. 2021. Indonesia as a legal welfare state: a prophetic-transcendental basis. *Heliyon* 7(8):1-8, doi:10.1016/j.heliyon.2021.e07865.
- Djafar, W. 2016. Reaffirming the rule of law commitment: a note on the trend of the rule of law deficits in Indonesia. *Jurnal Konstitusi* 7(5):151, doi:10.31078/jk757 (in Indonesian).

- Fauzi, A. 2019. Regional autonomy in the framework of realizing good regional governance. *Jurnal Spektrum Hukum* 16(1):119-136 (in Indonesian).
- Feng, Z., Hu, Z., Li, G., Zhang, Y., Zhang, X. and Zhang, H. 2022. Improving mine reclamation efficiency for farmland sustainable use: insights from optimizing mining scheme. *Journal of Cleaner Production* 379:134615, doi:10.1016/j.jclepro.2022.134615.
- Firmansyah, F. and Sugiarto, S. 2020. Juridical review of sand mining business management based on the law of the Republic of Indonesia Number 3 of 2020 concerning amendments to Law Number 4 of 2009 concerning mineral and coal mining. *Madani Legal Review* 4(2):124-140 (in Indonesian).
- Flint, R.W. 2013. *Practice of Sustainable Community Development: A Participatory Framework for Change*. Pp. 1-458. Springer.
- Friedrich, C.L. 1971. *Political Decision-Making, Public Policy and Planning*. Wiley Online Library, doi:10.1111/j.1754-7121.1971.tb00488.x.
- Ganatsas, P., Tsakalidimi, M., Ioannidis, L. and Strafkou, T. 2021. Evaluation of restoration of an asbestos mine in Northern Greece, eight years after restoration works. *Journal of Degraded and Mining Lands Management* 8(4):2957-7290, doi:10.15243/jdmlm.2021.084.2957.
- Halonen, M., Näyhä, A. and Kuhmonen, I. 2022. Regional sustainability transition through forest-based bioeconomy? Development factors' perspectives on related policies, power, and justice. *Forest Policy and Economics* 142:102775, doi:10.1016/j.forpol.2022.102775.
- Hamzah, H. 2019. Political law of natural resources. *Jurisprudentie* 6(2):576-290, doi:10.24252/jurisprudentie.v6i2.11079 (in Indonesian).
- Harjadi, D., Praramdana, G.K., Komarudin, M.N. and Manalu, V.G. 2021. Empowerment in managing digital marketing to create a cultural tourism village in Cigugur District, Kuningan Regency. *Empowerment: Jurnal Pengabdian Masyarakat* 4(01):42-53. doi:10.25134/empowerment.v4i01.4200 (in Indonesian).
- Hasyim, M. and Mardhatillah, S.R. 2020. The principle of regional autonomy in law enforcement of environmental permits. *Bina Hukum Lingkungan* 5(1):40-61, doi:10.24970/bhl.v5i1.137 (in Indonesian).
- Herman, H. and Muin, F. 2018. Systematization of types and hierarchy of legislation in Indonesia. *Jurnal Komunikasi Hukum* 4(2):89-101, doi:10.23887/jkh.v4i2.15445 (in Indonesian).
- Ilmi, P.N. and Imanulah, M.N. 2019. Horizontal synchronization level of setting mining business permits based on the law on coal and Law Number 9 of 2015 concerning the amendment of the two Laws Number 23. *Jurnal Hukum dan Pembangunan Ekonomi* 7(2):258-265 (in Indonesian).
- Jayadi, M., Wahid, K., Neswati, R. and Andriansyah, A. 2022. Improvement of post-nickel mining soil fertility with biochar and calcite. *Journal of Degraded and Mining Lands Management* 10(1):3803-3808, doi:10.15243/jdmlm.2022.101.3803.
- Kehutanan dan Lingkungan Hidup, Kementrian. 2017. Results of the feasibility study location of recovery of former mine land, Kuningan Regency, West Java Province (in Indonesian).
- Kettner, P.M., Moroney, R.M. and Martin, L.L. 2016. *Designing and Managing Programs: An Effectiveness-Based Approach*. SAGE Publications.
- Kopnina, H., Muhammad, N.Z. and Olaleru, F. 2022. Exploring attitudes to biodiversity conservation and half-earth vision in Nigeria: a preliminary study of community attitudes to conservation in Yankari game reserve. *Biological Conservation* 272(July):109645, doi:10.1016/j.biocon.2022.109645.
- Kumandhani, P.S. 2021. Enforcement of environmental law by local governments within the framework of regional autonomy. *Dharmasiswa* 1(September 2021):1367-1382 (in Indonesian).
- Laubi, I. 2023. Land use-land cover change in the Tano Basin, Ghana and the implications on sustainable development goals. *Heliyon* 9(4):e14859, doi:10.1016/j.heliyon.2023.e14859.
- Mangukiya, R.D. and Sklarew, D.M. 2023. Analyzing three pillars of sustainable development goals at sub-national scales within the USA. *World Development Sustainability* 2(December 2022):100058, doi:10.1016/j.wds.2023.100058.
- Mayasoni, L. 2022. Methods of measuring public policy effectiveness. *Jurnal Sosial Politik Integratif* 2(3):169-173 (in Indonesian).
- Mohammad, J., Jaelani, Ly, A.K., Quang, D. and Kerry, G. 2022. Legal protection of the indigenous community in protected forest areas based on forest city. *Bestuur* 10(2):198-212, doi:10.20961/bestuur.v10i2.66090.
- Muabezi, Z.A. 2017. State based on law (rechtsstaat) not power (machtsstaat). *Jurnal Hukum dan Peradilan* 6(3):421-446, doi:10.25216/jhp.6.3.2017.421-446 (in Indonesian).
- Muslih, M. 2013. The Indonesian law state in the perspective of Gustav Radbruch's legal theory (three basic values of law). *Legalitas* IV(1):130-152 (in Indonesian).
- Narendra, B.H., Siregar, C.A., Turjaman, M., Hidayat, A., Rachmat, H.H., Mulyanto, B., Maharani, R., Rayadin, Y. and Prayudyarningsih, R. 2021. Managing and reforestation degraded post-mining landscape in Indonesia: a review. *Land* 10(6):1-29, doi:10.3390/land10060658.
- Nasihin, I., Prasetyo, L.B., Kartono, A.P. and Kosmaryandi, N. 2016. Land cover change in Kuningan District during 1994 - 2015. *Procedia Environmental Sciences* 33:428-435, doi:10.1016/j.proenv.2016.03.093.
- Opoku, E.E.O., Dogah, K.E. and Aluko, O.A. 2022. The contribution of human development towards environmental sustainability. *Energy Economics* 106:105782, doi:10.1016/j.eneco.2021.105782.
- Peters, F., Lippe, M., Eguiguren, P. and Günter, S. 2023. Forest ecosystem services at landscape level – why forest transition matters? *Forest Ecology and Management* 534(February):120782, doi:10.1016/j.foreco.2023.120782.
- Putri, N.D. and Wicaksono, D.A. 2016. Legislative implications of the takeover of authority in the mineral and coal mining sector by the central government. *Jurnal Legislasi Indonesia* (3):19-32 (in Indonesian).
- Salam, S. 2020. Reconstruction of the philosophical paradigm of science: a critical study of law as a science. *Ekspose: Jurnal Penelitian Hukum dan Pendidikan* 18(2):885-896, doi:10.30863/ekspose.v18i2.511 (in Indonesian).
- Satria, A.P. 2020. Environmental quality protection in the period of industrialization to realize environmental-based industry. *Unifikasi: Jurnal Ilmu Hukum* 6(2):156-163, doi:10.25134/unifikasi.v6i2.1962.
- Setiawan, R. 2018. Implications of amendments to local government laws on the governance authority of energy

- and mineral resources utilization by regional governments in Indonesia. *Jurnal Kajian Pemerintahan* 4(1):71-86 (in Indonesian).
- Shabarudin, S. and Rahmat, D. 2022. Legal analysis of iron sand mining conflict in Kulon Progo Regency, Yogyakarta. *Unifikasi : Jurnal Ilmu Hukum* 9(2):88-102, doi:10.25134/unifikasi.v9i2.6512.
- Smith, L.M., Reschke, E.M., Bousquin, J.J., Harvey, J.E. and Summers, J.K. 2022. A conceptual approach to characterizing ecological suitability: informing socio-ecological measures for restoration effectiveness. *Ecological Indicators* 143(December 2021):109385, doi:10.1016/j.ecolind.2022.109385.
- Sudarmadji, Triyono, and Hartati, W. 2021. Post-mining evaluation of forest land rehabilitation and potential ecosystem recovery. *Advances in Biological Sciences Research* 11:388-396, doi:10.2991/absr.k.210408.064.
- Swantari, A., Ratnaningtyas, H. and Festivalia, F. 2021. Agrotourism development using location quotient analysis in Cibuntu-Kuningan Village. *Tourism Research Journal* 5(2):165-173, doi:10.30647/trj.v5i2.126.
- Van Wijk. H.D. and Konijnenbelt, W. 1988. Hoofdstukken van Administratief Recht. Uitgeverij Lemma BV.
- Wibisono, Y. and Azham, Z. 2017. Inventory of plant species potentially as medicines in medicinal plant conservation plots in KHDTK Samboja, Samboja District, Kutai Kartanegara Regency. *Agrifor* 16(1):125-140 (in Indonesian).
- Widodo, S. and Pranandita, N.M. 2022. Scheme for the transfer of coal mining business activities from IUP holders to third parties. *Jurnal BPPK* 15(2):28-42, doi:10.48108/jurnalbppk.v15i2.739 (in Indonesian).
- Winami, N.L., Pradana, D.H., Ayujawi, S.A., Zackeisha, N., Anugra, B.G., Wulandari, Y. and Syachrudin, D. 2022. Problems in Paradise: Mangrove bird communities impacted by litter in Jakarta Bay, Indonesia. *Ocean & Coastal Management* 225:106223, doi:10.1016/j.ocecoaman.2022.106223.
- Zhang, Z., Hu, B. and Qiu, H. 2022. Comprehensive evaluation of resource and environmental carrying capacity based on SDGs perspective and three-dimensional balance model. *Ecological Indicators* 138:108788, doi:10.1016/j.ecolind.2022.108788.