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# The effectiveness of post-mining land rehabilitation policy in realizing environmental sustainability: lessons from Sukageuri View, Kuningan

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## Abstract

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 a variety of 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 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.

**Keywords:** Policy; Post-mining Land Rehabilitation; Sustainability

## Introduction

According to the 1945 Constitution of the Republic of Indonesia, 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 in achieving a happy life based on the principles of Pancasila (Dimiyati et al. 2021). In order 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, Hu, and Qiu 2022). Article 28H of the 1945 Constitution stated that a good and healthy environment is the fundamental right of every Indonesian citizen (Akhdhian 2020). The declining quality of the environment poses a significant threat to the survival of humans and other living organisms. 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, Adji, and Rahardjo 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-Arcenales 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 neighbourhoods, with the central government located in 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 mining industry, Kuningan Regency is renowned for its flourishing agricultural tourism, concentrated in several areas, including the small villages of Cisantana and Cibuntu (Swantari, Ratnaningtyas, and Festivalia 2021). These villages have re-purposed post-mining sites into national parks, such as Cisantana and Curug Sawyer Parks, which serve as tourist attractions (Harjadi et al. 2021). The transition from mining sites to tourism parks, as part of the bioeconomy, create tensions associated with economic growth, ecological integrity, and social justice (Halonen, Näyhä, and Kuhmonen 2022).

The allocation of tasks among the Central, Provincial, and Regency/City Governments in Indonesia is based on several factors, including accountability, efficiency, externalities, and national strategic interests. 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 mining sector. Sometimes the government needs partners in the form of business entities engaged in mining, as the mining industry plays an important role in providing real added value to national economic growth and sustainable regional development.(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 Mining Business License (MBL).(Baura et al. 2022) The issuance of this legality in Kuningan Regency is subject to the authority of the regional government, 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 analyzed the levels of macro and micronutrients in five reclamation sites and one undisturbed location, and the results generally suggested that the reclamation efforts have achieved some level of success(Adonadaga, Sambil-Kolong, and Ampadu 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). Nickel post-mining land reclamation requires a lengthy process and innovative solutions to improve soil properties. One alternative technology for post-mining land reclamation is to utilize Empty Fruit Bunches (EFB) as biochar and applying Calcite ( $\text{CaCO}_3$ ). The application of biochar and calcite to post-nickel mining land can substantially increase soil pH, available P, organic C, cation exchange capacity, *Mucuna sp.* growth, and reduces exchangeable Al content. The treatment of 7.5% biochar by weight of soil and  $4.5 \text{ t ha}^{-1}$  calcite provides the best results in improving soil fertility and *Mucuna sp.* growth compared to other procedures(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 fibres and provides a sustainable future for post-mining area 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, which is attributed solely to illegal small-scale mining, known as galamsey, and large-scale legal mining. Good environmental regulations and management in this sector help to address the effects of mining activities on land and water resources(Awotwi et al. 2021). Based on the above description, this study aims to examine the effectiveness of post-mining land rehabilitation policy in realizing environmental sustainability, specifically in Sukageuri View, Kuningan.

## Materials and Methods

This descriptive research was carried out using a non-doctrinal legal design method with a conceptual and case study approach utilized to investigate and solve problems in real-world situations. Data were collected from primary and secondary sources with secondary data derived from literature reviews and theories, which were used as analytical tools(Salam 2020). The data collected were evaluated using qualitative descriptive analysis, and the study also relied on mining regulations and mass media. 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 conducted 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 method used for plants was the quadrat sampling technique with single and sub-plots arranged systematically(Wibisono and Azham 2017). This study was conducted from February 8<sup>th</sup> to 18<sup>th</sup>, 2023, in Cisantana Village, 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).

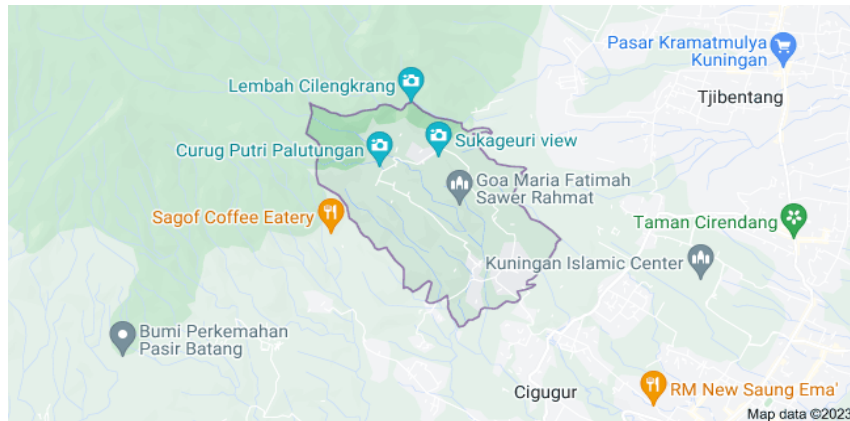


Figure 01. Map of Sukageuri View Cisantana Village, Kuningan, West Java

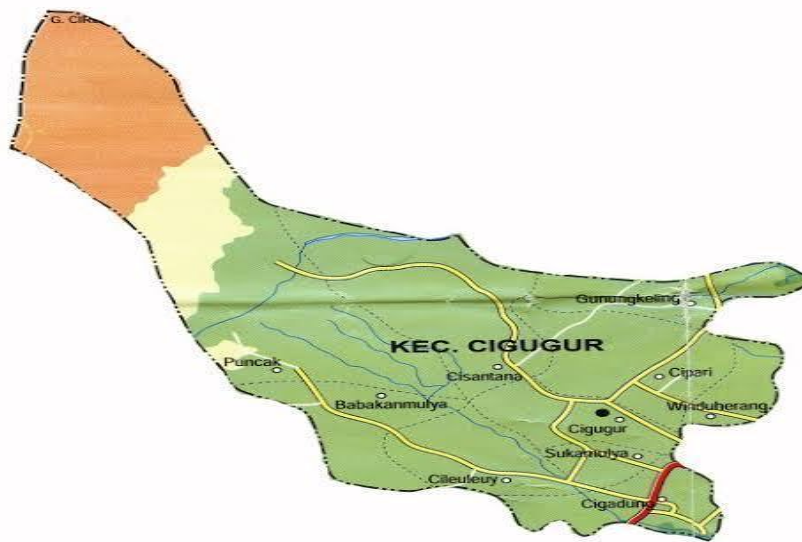


Figure 02. Map of Cisantana Village, Cigugur Sub-district, Kuningan Regency, West Java

Table 01. List of Mineral and Coal Mining Regulations

No.	Mineral and Coal Mining Regulations
1	The 1945 Constitution.
24	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.
2	Law Number 4 of 2009 concerning Mineral and Coal Mining
6.	Law Number 3 of 2020 concerning Amendments to Laws. 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
9	Government Regulation Number 22 of 2021 concerning the Implementation of Environmental Protection and Management
17	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 VOE

## Results and Discussion

### Government Regulations 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). Julius Stahl reported that a rule-of-law state possesses four foundations, namely protection of human rights, separation of powers, governance based on laws and regulations, and the existence of administrative justice. 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 William G. Andrews, the pillars of constitutionalism as a rule of law include agreement on common goals or aspirations, agreement on the rule of law as the basis of government or state administration, and agreement on the form of institutions and constitutional procedures. (Djafar 2016) Law Number 23 of 2014 on Regional Government states that the Regional Government focuses on the administration of government affairs while the Regional Parliament is based on the principles of autonomy and allocation of tasks with the widest possible autonomy within the system of the Unitary State of the Republic of Indonesia (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 the effort to achieve specific objectives (Hamzah 2019). According to Carl L. Friedrich policy is a series of actions proposed by an individual, group, or government in a particular environment with existing threats and opportunities. The proposed policy is intended to harness the potential and overcome obstacles to achieve specific goals (Alhaddhian et al. 2021).

According to Article 1 of Law Number 4 of 2009 concerning Mineral and Coal Mining, mining encompasses all activities related to analyzing, managing, and exploiting minerals or coal. This includes general investigation, exploration, feasibility study, construction, mining, processing and refining, transportation and sales, as well as post-mining exercises. Article 6 further specified that Mining Business refers to the exploitation of minerals or coal, encompassing all stages from the general investigation, exploration, feasibility study, construction, mining, processing and refining, transportation and sales to post-mining activities. Post-mining, as defined in Article 1 paragraph (27), is a planned, systematic, and ongoing activity after the end of some or all mining exercises. It is aimed at restoring the natural environmental and social functions of the site in accordance with local conditions.

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 are submitted to the Parliament for further action. (Samyo, Fauzan, and Ardhanariswari 2021) Article 28H paragraph (1) states that every citizen has the right to a prosperous life, physical and mental well-being, access to shelter in a good and healthy environment, as well as the right to obtain health services. Article 33, paragraphs (2) and (3) reported that the state controls branches of production crucial to the country, which has a significant impact on the livelihoods of many people. Land, water, and natural resources contained therein are owned by the state and used for the greatest prosperity of the people. According to Article 33, paragraph (4), the national economy is built on economic, democratic principles of togetherness, efficiency with justice, sustainability, environmental awareness, and self-reliance while maintaining a balance between progress 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 m. 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 m. supervision and guidance on post-mining land reclamation. Similarly, Article 8(1) specified that the regency/city government is responsible for k. 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 j. environmental aspects, including post-mining land reclamation, as well as k. funds for its reclamation and guarantee. Article 73(2) designated the regency/city government as responsible for ensuring technical security in mining activities, encompassing a. occupational health and safety, b. environmental management, and c. 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 i. environmental aspects, including post-mining land reclamation, along with j. 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 mining environmental (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 environmental.

Article 79 stated that SMBL for production operations, as mentioned in Article 76 paragraph (1) letter b, should contain provisions for i. environmental management, including reclamation and post-mining activities, j. 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 mining environment, including reclamation and post-mining activities, d. conservation of mineral and coal resources, 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 (1) stated that 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. (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 (1) stipulated that 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 stipulated 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 (c), Types of mining services include a. consultation, planning, implementation, and testing of equipment in the fields of 1) general exploration, 2) exploration, 3) feasibility studies, 4) mining construction, 5) transportation, 6) mining environmental, 7) post-mining and reclamation, and 8) 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 stated 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, are 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) allowed 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) required 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, are 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 defined the authority and duties of environmental supervisors as follows (1) Environmental supervisors appointed under Article 71 paragraph (3) are authorized to a. monitor, b. request information, c. make copies of necessary documents and take notes, d. enter a specific location, e. take photographs, f. make audio-visual recordings, g. take samples, h. inspect the equipment, i., inspect installations and transportation facilities, as well as j. stop certain violations. (2) Environmental supervisors may coordinate with civil servant investigator officials in carrying out their duties. (3) The party responsible for businesses and related activities is prohibited from obstructing the implementation of the duties of environmental supervisor. (Kumandhani 2021)

In Law Number 6 of 2014 concerning Village, Article 1 (1) defined 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 additional rights. The Village Government, as stated in Article 1 (2), is responsible for implementing governance affairs and addressing the interests of the local community within the Indonesian governance system. This parastatal consists of the Village Head and other village apparatus, as mentioned in Article 1 (3). 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 (1), stated that the Village Head is responsible for organizing Village Government, implementing Village and community development, as well as empowerment initiatives. (2) In 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), stated 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 supervision and guidance of Government Affairs 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 stated 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) defined mining as a set of activities encompassing 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 area, 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 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, Tangkudung, and Lambonan 2022) namely 1) Radioactive minerals such as Radium, Thorium, and Uranium; 2) Metallic minerals including Gold and Copper, 3) Non-metallic minerals like Intang and Bentonite, and 4) 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 Number 78 of 2010 concerning Reclamation and Post-Mining for MBL Holders, Article 44 (1) states that the regency/city government is required to 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, as well as Post-Operation. Under Article 22 (1), Exploration MBL and SMBL holders must submit plans and carry out Exploration Reclamation following Environmental Document. (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, stated 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, the Regional Regulation Number 11 of 2015 pertains to the Organizational Structure and Work Procedures of the Village Government. 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. In carrying out the tasks as referred to in paragraph (1), the Village Head has the authority c. to manage the Finances and Assets of the village and d. to 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 11. Village Government refers to the Village Head or another appointed official, assisted by other members of the village apparatus. 12. In Indonesia, it is responsible for administering governmental affairs and serving the interests of the local community within the system. 13. The VOE is a business entity where the Village owns either 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. Improve 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. Increase the income of the village community and its Original Income.

Table 2. Data of Tourist 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, 2023

Table 3. 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, 2023

Table 4. 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

Table 5. 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 linci</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.	Perenjak 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

Table 6. 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, meatball, 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> ,	2 employees

		snacks, chicken package	
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 drink 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

### The Effectiveness of Cisantana Village Government Policy in Postmining Land Rehabilitation in Realizing Environmental Sustainability

Policy is described as a set of principles and concepts that guide planning and decision-making to achieve specific goals. According to Carl L. Friedrich, 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. Adhi Putra Satria, "Environmental Quality Protection in the Period of Industrialization to Realize Environmental-Based Industry," *UNIFIKASI: Jurnal Ilmu Hukum* 6, no. 2 (2020): 156–163. Legislative authority can be granted through attribution, delegation, or mandate (Herman and Muin 2018). According to H.D Van Wiljk and Willem Konijnenning, attribution involves assigning governance authority to a government body by the legislature<sup>39</sup>, while delegation transfers authority from one government body or official to another through legal regulations (Asmar 2017). According to Kettner, Moroney, and Martin, program evaluation can be considered effective when it meets certain criteria. These include the governments 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, to effectively manage post-mining forest land, a comprehensive approach should be taken, 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, Muhammad, and Olaleru 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. Oekan S. Abdoellah stated several measures that need to be taken to achieve this goal(Akhmaddhian, Hartiwiningsih, and Handayani 2017). 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, making sustainable development a priority(Opoku, Dogah, and Aluko 2022).

Sustainable development is about improving human productivity without harming society or 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).

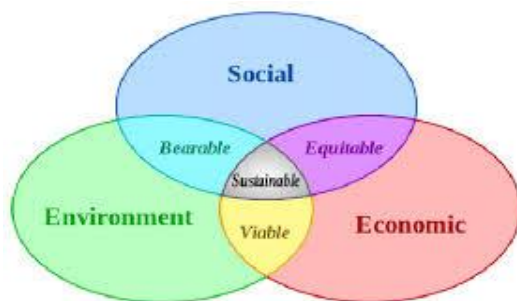


Figure 3. Sustainability Model (RW. Flint, 2013)

The effective management of post-mining land rehabilitation policy must consider ecological, social, and economic aspects to ensure sustainability, justice, and community well-being. The Village Government of Cisantana

implemented such a policy in 2016, creating the Cisantana VOE as a business unit under the Village Government of Cisantana to manage 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 improve the well-being of local communities. The management of post-mining area as Sukageuri View tourist attraction is in line with the Flint Sustainability Model, which emphasized the interrelated aspects of environmental, social, 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 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 in a sustainable and beneficial way.

## Conclusion

In conclusion, the success of 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. The implementation of policy through the establishment of Sukageuri View as a tourist attraction has had a positive impact on environmental, social interactions within the community, and economic growth in the area. The continued support and development of Sukageuri View is necessary to ensure the long-term effectiveness of policy in preserving environmental, 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 environmental.

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