

## **Analysis of Mining of Mineral C on Agricultural Land in Gondangrejo District, Karanganyar Regency**

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**Abstract:** Agricultural land is land that is easiest to convert for other needs. Meeting the need for land includes agricultural facilities, production sites and also housing. Every year existing agricultural land is reduced due to land conversion. The land conversion that occurred in Jatikuwung Village, Jeruksawit Village and Wonosari Village, Gondangrejo District, Karanganyar Regency turned agricultural land into excavated mines. Apart from that, these three villages are included in the Sangiran Dayu cluster site. Special attention is needed so that the conversion of agricultural land to C excavation mining does not damage the Sangiran Dayu cluster site nor does it damage existing agricultural land. Quarry C mining damages existing agricultural land so that a lot of ex-mining land is damaged. This damage causes less functioning of the land to be returned as an agricultural area.

This research aims to determine the level of damage to agricultural land that has occurred and determine the rehabilitation efforts carried out.

Data collection was carried out from January to May 2023. The research method used was descriptive-qualitative research. Sampling was determined by proportional purposive sampling. Research data were obtained through interviews, observation, and direct measurements in the field. The results of the research show that from 2000 to 2022, mining processes have occurred several times on agricultural land on different land. The results of the analysis based on the parameters used show that agricultural land is heavily damaged at points Jatikuwung 1 and 2, Wonosari 1 and 2, as well as JS 1, JS 2, JS 7, JS 8, JS 9, JS 10 and JS 11. Land damage is severe. This has resulted in many ex-mining lands not being rehabilitated to be returned to agricultural areas but transferred to other uses. Further treatment is needed in ex-mining areas, land rehabilitation tends not to be carried out, there is succession and more often ex-mining is converted to other land uses. Ex-mining land tends to be left to undergo natural rehabilitation so this requires more attention from the farming community, those responsible for mining as well as the government in order to maintain the function of the land again as an agricultural area.

**Keywords:** agricultural land, level of damage to agricultural land; Mining; rehabilitation

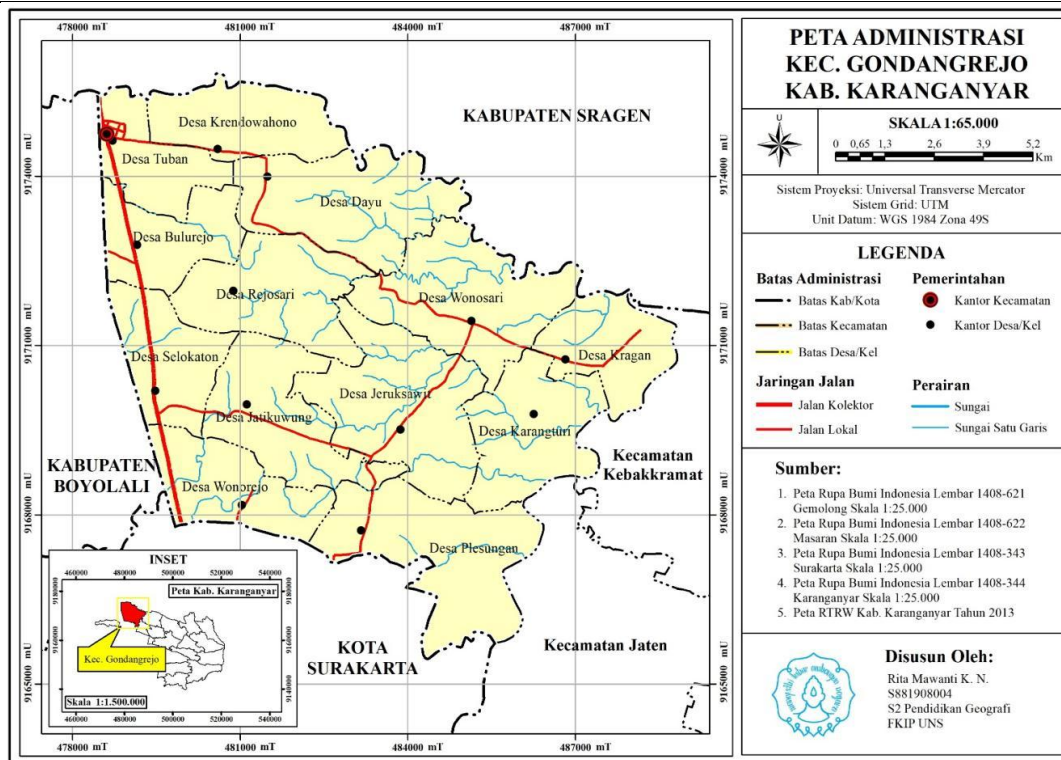
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### **Introduction**

Land is a land area whose characteristics include all biosphere, atmosphere, soil, geology, topography, hydrology, plant and animal populations as well as the results of past and present human activities that are stable (PP No. 150 of 2000). Agricultural land is the most easily converted open land for various purposes. Agricultural land is the most extensive of all existing land uses. Nowadays, land use changes occur very often as a result of the many demands to fulfill needs to improve the quality of life.

Development in Gondangrejo District cannot be separated from the 2013-2032 Karanganyar Regency RUTK article 44 which states that Gondangrejo District is the center for developing industrial, trade and city service centers, clarified by article 34 that Gondangrejo District is the direction for residential development. This confirms that the conversion of agricultural land that occurs is the target of development in Karanganyar Regency. Based on the Karanganyar Regency RUTRK articles 23 and 25, it is also emphasized that Gondangrejo District is a cultural protected area and an archaeological site preservation area with the Sangiran Dayu Cluster Site.

Jatikuwung Village, Jeruksawit Village and Wonosari Village are three villages out of 6 villages which are the Sangiran Dayu Cluster site area in Gondangrejo District. The location of the three villages can be seen on the following map:



The conversion of agricultural land functions occurs along with the development of the village area. The close distance to Surakarta City with relatively short travel time to the city center has accelerated the development of the village. Adequate connecting roads between cities and regencies, ease of online and offline transportation affect the mobility of goods and services. Integrated management is needed from the government, community members and related agencies to protect the Sangiran Site area in the Dayu cluster so that village development does not damage the existing site area. Changes in land use in the three villages over 20 years are presented in the following table:

T able 1. Land Use in Jeruksawit Village  
 Land Use of Jeruksawit Village

No.	Land Use	Area (hectares)				
		2000	2005	2010	2015	2022
1	Ricefield	507.107926	469.353913	454.965974	420.739257	414.967929
2	Settlement	142.772565	152.630543	168.00655	168.969864	189.429404
3	Plantation	16.351116	19.410521	17.160167	16.833361	10.87995
4	Empty land	0	8.676832	10.205923	44.192641	32.425947
5	Moor	0	16.159799	15.892994	15.496485	18.528377

Source: processed iconos image results,

Table 1.2 Land Use in Wonosari Village  
 Wonosari Village Land Use

No.	Land Use	Area (hectares)				
		2000	2005	2010	2015	2022
1	Ricefield	480.073327	451.360234	439.344347	425.085333	420.339271
2	Settlement	95.254678	109.514192	115.871881	120.280686	126.575108
3	Plantation	27.216044	41.142476	44.757113	48.526116	47.751373
4	Empty land	2.234478	2.761623	4.805186	9.09085	8.317233
5	Moor	17.074143	17.074143	17.074143	18.869683	18.869683

Source: processed iconos image results

Table 1.3 Jatikuwung Village Land Use

Jatikuwung Village Land Use						
No.	Land Use	Area (acres)				
		2000	2005	2010	2015	2022
1	Ricefield	329.921716	306.969383	294.049395	287.470201	272.907516
2	Settlement	120.695512	130.313411	134.000933	132.0396	143.231007
3	Plantation	40.263008	36.431484	37.625665	35.670547	35.603888
4	Empty land	5.311233	22.477192	30.515477	41.011122	44.449057
5	Moor	0	0	0	0	0

Source: processed image results from iconos,

The land changes that have occurred over the past 20 years in these three villages have not only led to residential development but also as areas for excavation mining C. Land conversion cannot be separated from the development arrangements for the village area itself. The development of article 36 of Regional Regulation No. 1 of 2003 concerning the RUTRK of Karanganyar Regency for handling mineral mining areas states that the three villages are landfill mining areas (excavation C). Mining is a series of activities in the context of search, mining, excavation, processing, utilization and sale of minerals, DLH Karanganyar Regency, (2018) .

The land that is mined is soil, sand and rock up to a certain depth will indirectly use up the humus layer in the *top soil layer* which is good for agriculture. Intensive mining of C minerals will take all parts of the soil, extracting rock and mineral deposits causing large holes in the soil which cause land degradation (Pain, 2013)

Assessment of the level of damage to ex-mining land needs to be done to facilitate the management of ex-mining land. This is done considering that mining land was originally agricultural land, so rehabilitation is needed to return it as an agricultural area. An assessment of the level of land damage is also needed to assist the village government in managing the physical potential of the village so that the construction site used for mining can be used for purposes other than returning it as an agricultural area.

Mining land rehabilitation is needed to reduce the impact of land damage. Filling up excavated holes, carrying out reforestation, intensive soil processing are one way to restore soil fertility. Soil fertility needs to be restored considering that mining land was originally agricultural land so it should be restored to its function as an agricultural area.

### Literature Review

Land is the most important element in meeting people's basic needs. The community's food, clothing and shelter needs are obtained from agricultural land production. Moreover, there is a government policy contained in Law No.7/1996 concerning food, it is stated that food security is the fulfillment of food for every household which is reflected in the availability of adequate food both in quantity and quality, safe, equitable and affordable (Anonymous, 2011).

A site is a place or location where an incident or occurrence occurs. So a site is a location as evidence of the occurrence of an event in the past and usually refers to archeology (Wikipedia; 2019)

In 2007 , the Sangiran site was divided into 4 (four) clusters to make it easier to introduce and show knowledge to the public. The four clusters are:

1. Krillan Cluster
2. Closing Cluster
3. Bukuran Cluster, these three clusters are supported by the Manyarejo field museum and finally,
4. The Dayu Cluster is supported by the Dayu Museum

Mining Business is an activity in the context of Mineral or Coal business which includes the stages of General Investigation, Exploration, Feasibility Study, Construction, Mining, Processing and/or Refining, Transportation and Sales, as well as post mining. (Ministry of Energy and Mineral Resources Regulation no. 26 of 2018)

For almost 30 years conventional agriculture has experienced worrying conditions. Indicators of agricultural concern include: 1) the level of land productivity is decreasing , (2) the level of soil fertility is declining, (3) the conversion of agricultural land is increasing, (4) the area and quality of critical land is increasing, (5) the level of pollution and damage to the agricultural environment increased, (6) the carrying capacity of the environment decreased, (7) the unemployment rate in rural areas increased, (8) the exchange power of farmers decreased, (9) the income and welfare of farmer families decreased, and (10) the gap between community groups increased. (Suntoro, 2006) degradation is affected by erosion, agrochemical pollution, industrial pollution , mining and quarrying C, and land conversion (Suntoro, 2006). Maillendra states that

damage to agricultural land due to mining is influenced by the amount of vegetation cover and tailings management (2019) damage that occurs in mining areas in general is a decrease in soil solum, high erosion, rock outcrops, slope and differences in the base relief of the mining area. The depth of the groundwater table affects the ability of the land to be managed again as agricultural land. This is related to the soil's ability to store and pass water after mining.

Mining has a bad effect on agriculture, namely narrowing the area of agricultural land and tight competition for fertile land and skilled labor (Assan, JK et al, 2018). Here it is stated that damage to mining land will result in a reduction in the area of agricultural land and a reduction in skilled workers to cultivate agricultural land due to changing professions. Farmers are changing professions due to pressure from the relatively high costs of processing ex-mining agricultural land.

Reclamation is an activity carried out throughout the mining business stages to organize , restore and improve the quality of the environment and ecosystem so that it can function again according to its intended purpose. (Ministry of Energy and Mineral Resources Regulation no. 26 of 2018) land must be reclaimed or repaired in various forms such as reforestation and afforestation. This is intended so that these lands do not experience land degradation. Land reclamation requires a relatively long time depending on the level of damage. This activity requires synergy between the government, mining permit owners and the surrounding community so that the level of land damage that occurs is not so severe.

### Analysis and Data Processing

Analysis technique is an analytical technique used to analyze data by describing or describing the data that has been collected without any intention of making generalizations from the research results. Data analysis techniques to be used in this study are:

1. Determining the criteria for damage to agricultural land in the research location used rules made by the government and parameters based on expertise. . These parameters are then weighted based on their effect on the damage that may arise. A number of These rules include:
  - a. Kep-43/MENKLH/10/1996 concerning Environmental Damage Criteria for Businesses or Mining Activities of Loose Type Class C Minerals on Land.
  - b. Central Java Provincial Regulation No. 26 of 2007 concerning management of protected areas in Central Java province.
  - c. Central Java Provincial Regulation no 22 of 2003 concerning the Management of the Sangiran Site
  - d. Government Regulation of the Republic of Indonesia No. 150 of 2000 concerning soil damage for biomass production

Parameters used for assessing damage to agricultural land due to mining of C minerals include:

Table 4 Criteria for assessing environmental damage to inland mining land

Land Damage Assessment Factors	Value (N)	Weight	NXB
Mining engineering	Correct	3	3
	Kind of true	2	
	Wrong	1	
Depth of excavation	<3 meters	1	3
	3-6 meters	2	
	> 6 meters	3	
Excavation area	<1000m	1	3
	1000-5000m	2	
	>5000m	3	
Differences in bas-relief of excavations	<0.5 meters	1	3
	0.5 - 1 meters	2	
	>1 meters	3	
The nature of the rocks that make up the excavation cliff	compact	3	3
	Rather compact	2	
	Free	1	
Slope of rock cliff	Flat (0-15)	3	3
	Slant ( 16 - 40)	2	
	Steep (41 - 90)	1	
Top soil and overburden management	saved	1	3
	Partially utilized	2	
	Discarded/not used	3	

Erosion rate	Small	1	3	
	Currently	2		
	Big	3		
Vegetation cover	>75% of the land is covered with vegetation	3	3	
	25 - 75%	2		
	< 25%	1		
Reclamation efforts	It's been implemented	3	3	
	Starting to implement	2		
	Not implemented yet	1		
Land Damage Assessment Factors		Value (N)	Weight	NXB
Mining engineering	Correct	3	3	

From these parameters, the range of damage to mining land is determined which is made as in the following table:

Table 3.5. Mining Land damage range

Damage Rate Range	Damage Level
10-30	Lightly damaged
31-60	Moderately damaged
61-90	Heavily damaged

Scoring the level of land damage is obtained by the formula:

$$I = \frac{r}{n}$$

Information:

I: class interval

R: sum of the highest scores - sum of the lowest scores

N: number of classes

Field observations to carry out measurements with agreed parameters. Weighting is done after measuring and observing the parameters in the field, to further determine the class of damage to the mining area.

2. Observations and interviews were carried out with residents around the mining area regarding the process of rehabilitation of ex-mining land. Interviews were also conducted with village officials regarding the rehabilitation of the mining area, whether it would be returned as a mining area or managed for another use.

## Results and Discussion

### a. The level of damage to the mining excavation area C

The research area has experienced land damage due to excavation C mining, this can be seen from the observations that have been made and the use of land damage parameters. From these activities it was found that there were locations that experienced light damage, moderate damage and heavy damage.

In Wonosari village, mining activities are carried out by moving all the soil solum without saving top soil, the slope of the excavation slope is steep, the excavation base relief is uneven. Mining activities are carried out quickly (> 18 m<sup>3</sup>/ day), in one day approximately 25 dump trucks enter and leave the mining area. Mining is done properly, with an open pit system. Excavated hole area > 5000 m<sup>2</sup> with basic relief > 1 meter.

Covering an area of approximately 6 hectares, excavation C was carried out in 2019-2021. Mining is carried out openly with different cliff depths, an average of more than 6 meters. The slope slope is close to 45<sup>0</sup>. The excavation slope forms a straight wall to the bottom of the excavation hole. The difference in the excavation base relief is more than 1 meter. In Wonosari Village Mining, the rocks are compact so they are quite strong even though the slope is steep. Erosion is relatively large because material from the top of the cliff will easily slide down when it rains. Erosion grooves are visible in the presence of grooves on the walls of the excavation. Vegetation cover is between 25-75% because much of the former mining area is left without land cover. Ex-mining land is at a serious level of damage. Calculation of the scoring level of damage to ex-mining excavation land C can be seen in the following table:

Table 4. 1 Table of scoring results in Wonosari village

No	Characteristics	Point 1	NxB1	Point 2	NxB2
1	Mining technique	3	3	3	9
2	Depth of excavation	3	3	3	9
3	Excavation area	3	3	3	9
4	Differences in the relief of the excavated base	3	3	3	9
5	The nature of the rocks that make up the excavated cliffs	3	3	3	9
6	Rock cliff slope	3	3	3	9
7	Top soil and overburden management	3	3	3	9
8	Erosion rate	3	3	3	9
9	Vegetation cover	3	3	3	9
10	Reclamation efforts	3	3	3	9
Index of damage to ex-mining land			90	-	90
Damage level		Heavily damaged		Heavily damaged	

Source: primary data processing

Figure 4.1. Wonosari Village Point



Source: personal documents

Erosion grooves appear on the walls that form watercourses. Mining is carried out in the southern border of the village which is an area that is permitted to be mined. The area that is permitted to be mined in Wonosari Village is adjacent to Jeruksawit Village, separated by a small river.

Figure 4. 2 Gemblung Village, Wonosari



Source: personal documents

Figure 2 is a sandstone and gravel mine. This mining was not carried out because the mining permit was not obtained. Mining was only carried out for approximately one month and was left abandoned until now.

Beneath the cliff excavations are still scattered pebbles and sand. In several parts of the cliff wall, it began to collapse because the sand was in the middle layer of the cliff wall, while solid rocks alternated between the layers of sand. Mining permits cannot be issued at every location in Wonosari Village because it is included in the Sangiran Dayu Cluster Site, so it is hoped that the authenticity of the site will be maintained.

**a. Jatikuwung**

Mining is done openly using excavators. Material extraction includes soil and stone. The depth of the cliffs is not the same, on average it is more than 6 meters. The slope of the slope is close to 45<sup>0</sup> so that it can be said to be steep. The difference in the bas-relief of the excavation is more than 1 meter. In this mining, the rocks are compact so they are quite strong even though the slope is steep. The fall of rock material is quite small. Erosion is considered large because material from the top of the cliff will easily slide down or be carried away by rainwater. The vegetation cover is between 25-75% because much of the remaining mining is left without land cover. This former mining created a vast plain plains with natural vegetation. The level of mining land damage can be seen in the following scoring table:

Table 4. 4 Table of scoring results in Jatikuwung village

No	Characteristics	Point 1	NxS	Point 2	NxS
1	Mining engineering	3	3	3	9
2	Depth of excavation cliff	3	3	3	9
3	Excavation area	3	3	3	9
4	Differences in bas-relief of excavations	3	3	3	9
5	The nature of the rocks that make up the excavation cliff	3	3	3	9
6	Slope of rock cliff	3	3	3	9
7	Management of top soil and overburden	3	3	3	9
8	Erosion rate	3	3	3	9
9	Vegetation cover	3	3	3	9
10	Reclamation efforts	3	3	3	9
Land damage index		-	90	-	90
Damage rate		Heavily damaged		Heavily damaged	

Source: primary data processing

Figure 4.3. former mining in Jatikuwung Village



Source: personal documents

**b. Palm oranges**

The total mining area is approximately 23 hectares, excavation C mining was carried out throughout 2015-2018. Mining is carried out openly. The depth of the cliff varies depending on the length of time the mine is taken but the average is more than 6 meters. The slope is close to 45<sup>0</sup>. The difference in the excavation base relief is more than 1-3 meters. In this mining, the rocks are compact so they are quite strong even though the slope is steep. The erosion is huge. Piles of material from the upper land collected at the bottom of the dug hole.

This will make it easier to manage ex-mining land for agriculture, although not all ex-quarried land will be reused as agricultural land. The vegetation cover is between 25-75% because much of the remaining mining is left without land cover.

Mining in Jeruksawit on a small scale has several objectives, including making public facilities, equalizing the height of agricultural land, and making bricks so that the land is not rehabilitated but the land is used according to needs. Leveling of agricultural land is almost common in this village considering its rough and uneven topography. The results of scoring the level of land damage in Jeruksawit Village are presented in the following table:

Location	present condition			level of damage	land area (m <sup>2</sup> )	Location coordinates		information
	still mined	being	not mined			X	Y	
wonosari			v	heavily damaged	50,000	07 <sup>o</sup> 30,096'	110 <sup>o</sup> 052.016'	dry farming
Bubble			v	heavily damaged	10,000	07 <sup>o</sup> 29,527'	110 <sup>o</sup> 51,069'	neglected
Banyubiru			v	heavily damaged	100,000	07 <sup>o</sup> 30,636'	110 <sup>o</sup> 50,322'	succession
Palm oranges 1			v	Heavily damaged	20,000	07 <sup>o</sup> 31,031'	110 <sup>o</sup> 50,583'	succession
Orange palm 2			v	heavily damaged	20,000	07 <sup>o</sup> 30,557'	110 <sup>o</sup> 51,715'	succession
Orange palm 3			v	Heavily damaged	20,000	07 <sup>o</sup> 30,603'	110 <sup>o</sup> 51,665'	succession
Orange palm 4			v	Lightly damaged	30,000	07 <sup>o</sup> 30,621'	110 <sup>o</sup> 51,665'	succession
Orange palm 5			v	slightly damaged	10,000	07 <sup>o</sup> 30,967'	110 <sup>o</sup> 51,602'	tombs and fields
Orange palm 6	v			moderate damage	10,000	07 <sup>o</sup> 30,292'	110 <sup>o</sup> 51,332'	housing facilities
Orange palm 7			v	heavily damaged	50,000	07 <sup>o</sup> 30,442'	110 <sup>o</sup> 51,791'	housing area
orangesawit 8			v	heavily damaged	50,000	07 <sup>o</sup> 30,864'	110 <sup>o</sup> 51,721'	housing area
Palm oranges 9			v	heavily damaged	25,000	07 <sup>o</sup> 30,120'	110 <sup>o</sup> 51,322'	swimming pool
Palm oranges 10			v	heavily damaged	10,000	07 <sup>o</sup> 30,355'	110 <sup>o</sup> 51,529'	rice fields
Orange palm 11			v	heavily damaged	20,000	07 <sup>o</sup> 30,126'	110 <sup>o</sup> 51,527'	dry farming

Table of characteristics of mining results

Characters/LOCATION	JS 1	JS 2	JS 3	JS 4	JS 5	JS 6	JS 7	JS 8	JS 9	JS 10	JS 11
Mining engineering	3	3	3	3	3	3	3	3	3	3	3
Depth of excavation cliff	3	3	2	2	3	3	3	3	3	3	3
Excavation area	3	3	1	2	1	3	3	3	2	3	3
Differences in the relief of the excavated base	3	3	1	1	3	3	3	3	3	3	3
The nature of the rocks that make up the excavated cliffs	3	3	1	3	3	3	3	3	3	3	3
Slope of rock cliff	3	3	3	1	1	3	3	2	3	1	1
Management of top soil and overburden	3	3	2	2	2	3	3	2	3	3	3
Erosion rate	3	3	1	2	2	3	3	2	3	3	3
Vegetation cover	3	3	1	1	1	3	3	2	1	1	1
Reclamation efforts	3	3	1	1	1	3	3	2	1	1	1

Table 4.5 Scoring of mining land in Jeruksawit Village



Characters/LOCATION	JS 1	JS 2	JS 3	JS 4	JS 5	JS 6	JS 7	JS 8	JS 9	JS 10	JS 11
Mining engineering	9	9	9	9	9	9	9	9	9	9	9
Depth of excavation cliff	9	9	9	6	9	9	9	9	9	3	3
Excavation area	9	9	9	6	9	9	9	9	6	3	3
Differences in bas-relief of excavations	9	9	9	3	9	9	9	9	9	3	3
The nature of the rocks that make up the excavation cliff	9	9	9	3	9	9	9	9	9	9	9
Slope of rock cliff	9	9	9	6	9	9	9	6	9	9	9
Top soil and overburden management	9	9	9	6	9	9	9	6	9	9	9
Erosion rate	9	9	9	6	9	9	9	6	9	9	9
Vegetation cover	9	3	9	6	9	9	9	6	9	3	3
reclamation efforts	9	3	9	6	9	9	9	6	9	3	3
Land damage index	90	78	90	45	90	90	90	75	90	60	60
Land damage level	RB	RB	RB	hospital	RB	RB	RB	RB	RB	hospital	hospital

Table 4. 6 parameter scoring results for Jeruksawit Village

RB = heavily damaged    RS = moderately damaged    RR = slightly damaged

The scoring results show that in Jeruksawit Village the mining land is in RB condition, heavily damaged. This condition allows for quite intensive land rehabilitation if it is to be returned to its function as an agricultural area.

#### B. Rehabilitation of ex-mining areas C

Rehabilitation carried out includes:

- In ex-mining areas with unequal heights and cliffs that are too steep, the land will be allowed to experience succession first. When the succession lasts between 1-3 years shrubs and shrubs will cover the land. Sedimentation from cliff slides will be retained by plant roots so that soil fertility will appear more quickly. When the succession period is over, the shrubs are sprayed with herbicide and then burned when they are dry. The land is then heated to maintain moisture and then planted with crops at the beginning of the following rainy season.
- The overdraft areas will be filled in first so they don't become big holes filled with water. In addition to reducing the risk of becoming a mosquito nest and/or drowning (accidentally falling into a dug hole) it is also to immediately level the level with the surrounding area.
- In mining areas that have a height difference between excavation cliffs of 1-2 meters, land of the same area will be directly managed as agricultural land. Starting with peanuts and black potatoes to speed up the storage of nitrates in the soil so that more nutrients are stored. After the first bean harvest period is over, a crop rotation system is implemented with cassava or corn. Ex-mining land because the topsoil is not stored, the soil tends to be in layers of parent material and parent rock so that it requires quite intensive maintenance.
- Remains of hills that are not taken as mining areas can be used to level and equalize the height differences that occur
- The topsoil that is saved can be returned to the mined area so that soil fertility is maintained. Ex-mining land can be immediately reused as an agricultural area without having to wait for land succession.
- Planting ex-mining land with plants according to community culture, for example perennials such as teak, mahogany, sengon, johar or acacia. Apart from reducing the amount of abandoned land after mining, this plant is suitable for planting in areas with minimal water and chalky areas.

### Conclusions and Recommendations

#### A. Conclusion

- Damage to agricultural land in 4 phases in Jatikuwung Village, Jeruksawit Village and Wonosari Village varied. Minor damage occurred when agricultural land was taken for personal use in Jeruksawit Village, moderate damage occurred in Jeruksawit Village which was used as a public facility and heavy damage in Wonosari Village and Jatikuwung Village resulting in a natural succession process on ex-mining land.

2. Rehabilitation is carried out naturally through a natural succession process over a period of 1-3 years. Rehabilitation is also carried out by closing the excavated holes using topsoil stored elsewhere, planting the land in accordance with the culture of the surrounding community

## B. Suggestion

1. Mining activities need to apply for SIPD. This is difficult to implement but if done it will make it easier to control and regulate mining activities
2. Mining entrepreneurs are required to pay reclamation funds when applying for a mining permit to anticipate post-mining land reclamation not being carried out. Reclamation should be the responsibility of mining business actors, not the responsibility of owners of mined land parcels

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