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Sangon and Acacia plant suitability for land reclamation of coal mines in PT. Karbindo Abesyapradhi Sijunjung District

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Abstract. The loss of the vegetation indirectly had removed the functions of the forests in regulating water system, controlling erosion and flood, absorbing carbon dioxide, supplying oxygen and controlling temperature. One of the efforts done to restore the quality of the environment around mining areas was by doing reclamation in accordance with the Regulation of Indonesian Government No. 78 Year 2010. This research applied cross-sectional design. The sample was taken in the areas vegetated. The variables studied were the chemical content of the soil (N, P, K, Ca and Mg), pH and Cation Exchange Capacity. The sample spread out in five areas reclaimed in Sungai Tambang PT Karbindo Abesyapradhi. The result of the research showed that the reclamation was done by planting sengon and acacia trees. The fertility of the soil (clay texture, acidity, Ca, Magnesium, Cation Exchange Capacity of the soil, C-Organic and N-total of the soil) in the reclaimed areas was similar. However, partially affecting both plant growth and sengon acacia tree is a cation exchange capacity and Soil Texture. It was recommended to PT Karbindo Abesyapradhi to maintain and care for reclamation has been done, because if based on the evaluation of the report on the implementation of reclamation showed reclamation does not meet the criteria of success, the Minister, the Governor, or the Regent / Mayor in accordance authority may assign a third party to conduct reclamation activities or entirely by using collateral reclamation.

1. Introduction

PT. Karbindo Abesyapradhi, the leading mining business permit owner of coal production operations in West Sumatra has the obligation to carry out environmental management, especially when and after mining in accordance with applicable regulations. The company is obliged to conduct an analysis of the important impacts of its activities, develop a plan for management and monitoring of the environment in its working area, and comply with every provision in EIA, RKL / RPL, and its employment contract. Because in the Amdal agreement PT. Karbindo Abesyapradhi which is located at positions 101020'30"-101022'40' 'East Longitude and 0049'30"-0052'13,8' 'South Latitude administratively this area is in the Kanagarian River Tambang - Kiliran Jao, District Kamang Baru, Sijunjung Regency, West Sumatra Province is done by open pit mining with a total coal reserve of ± 4,405,631 tons of production averaging 200,000 tons per year, so it is estimated that the mine life of ± 22 years is agreed upon the reclamation must be cultivated, including sengon and acacia trees.

Furthermore, the company is obliged to reclaim and revegetate ex-mining land so that the land has carrying capacity and environmental functions in accordance with the provisions. Thus, reclamation



activities should not only be seen as a part of mining operations but are stages in the mine closure process.

Based on the description above, the researcher raised this research with the title "The Conformity of Sengon and Acacia Plants for Reclamation of Former Coal Mine in PT. Karbindo Abesyapradhi-Sijunjung Regency". Reclamation activities are emphasized on improving soil quality, in terms of soil organic matter content, macro nutrients N, P, K, Ca, Mg soil and value of Cation Exchange Capacity (CEC) as well as weight volume (BV) of land, from reclamation activities- reforestation which has been carried out since 1993 to research in stages. Land that has been laid out and planted with the main plant species sengon (*Albizia falcataria*) and acacia (*Acacia mangium*). Thus it is expected to describe the role of plants in the status and dynamics of soil fertility. The soil fertility status is determined by the physical, chemical and biological properties of the soil. But this study focuses on observing canopy or tree canopy in terms of soil fertility and soil chemical properties.

2. Coal and Reclamation

Coal is a sediment composed of organic matter and inorganic materials. Organic materials are made up of remnants of plants that experience decomposition and changes in their physical and chemical properties, either before or after being covered by other deposits. Inorganic materials consist of several minerals, for example clay minerals, carbonates, sulfides, silicates, and so on

Coal mines, especially open-pit mines, require large areas to be temporarily disturbed. This raises environmental problems, including soil erosion, dust, noise and water pollution, and impacts on local biodiversity. Actions are carried out in modern mining operations to reduce these impacts. Good environmental planning and management will reduce the impact of mining on the environment and help preserve biodiversity.

In the environmental aspect, mining companies from the outset should pay attention to the Environmental Impact Analysis (AMDAL) that they have made, in accordance with the Decree of the State Minister of Environment No: 17 of 2001 concerning Types of Business Plans and / or Activities Required with EIA. General mining business activities with wide permits for Mining Business Permits (IUP) above 200 hectares or wide open areas for mining above 50 hectares cumulative per year must be completed with an AMDAL. This is very necessary to avoid open land that is too large.

The potential for significant impacts on the environment from general mining businesses includes changing landscapes, ecology and hydrology. Then, the duration of the business activity will also have an important impact on air quality noise, vibration when using explosives, and the impact of liquid waste produced. For exploitation of coal/peat production of more than 250,000 tons/year, primary ore more than 250,000 tons/year and secondary ore/alluvial deposits of more than 150,000 tons/year are all required to use AMDAL.

Reclamation of ex-mining land is an activity that aims to improve or organize the use of disturbed land as a result of mining business activities so that it can function and be efficient in accordance with its designation. In accordance with the prevailing laws and regulations, every Mining Company that engages in mining business activities, except for general investigation and exploration activities, is obliged to reclaim the former mining activities it undertakes. The cost of conducting reclamation is part of the production expense, which is one of the deducting factors of business sales (income derived from the company's mining products) to obtain a gross profit (loss). In order to guarantee the compliance of mining companies to carry out reclamation in accordance with the Reclamation Plan, mining companies are required to provide a Reclamation Guarantee, the amount of which is in accordance with the Reclamation Cost Plan that has been approved by the Minister, Governor and Regent / Mayor according to their authority. Reclamation guarantees can take the form of time deposits, bank guarantees, insurance, and accounting reserves (accounting reserve). The guarantee must be placed by the Mining Company before the Company starts a mining production or exploitation business.

3. Geological Process of Coal Formation

Coal comes from plant material through the geological process and the influence of pressure and heat so that the physical and chemical properties change. Because of its chemical composition, geologically coal is classified more closely as mineral rock [1].

The main components of coal are Carbon, Hydrogen, Nitrogen, Oxygen, Sulfur. These minerals include Silica (SiO_2), alumina (Al_2O_3), Iron oxide (Fe_2O_3), Magnesia (MgO), phosphor pentoxida (P_2O_5) and Potassium oxida (Na_2O dan K_2O) [1].

Indonesian coal has a low rank coal, which is from peat (peat) to subbituminous, the quality is very good, the ash content and its sulfur with adequate heating value for heat and physical generation. Coal in Indonesia is generally young, but the coal is of good quality, because it has experienced very high pressure caused by symptoms of mountain formation (orogenesis).

4. Considerations in Reclaiming Former Mine Land

There are 3 (three) considerations that must be considered in carrying out mining land reclamation, namely consideration of soil chemistry, soil physical and land topography [2]. First, chemically, there are two problems related to spoil material produced by open coal mining, namely the overburden is too alkaline or too acidic. In arid and semi-arid areas with low rainfall, this will be a problem because ground water containing high salt will cause water to be difficult to penetrate plant root membranes so that it greatly affects and disrupts plant growth. The second is related to the physical nature of the soil. The rock blasting process will reduce the amount of rock because it turns into sand and dust and reduces the number of soil particles because it will turn into clay. The stepping technique produces mixing between sand, dust and clay. Third is the topography of the land. The slope of the land will cause problems in revegetating the land. The type and number of plants need to be considered in relation to their ability to control erosion and nutrient deterioration.

5. Research Methodology

The research method used in this writing uses quantitative methods, with the type of crosssectional research. Crosssectional research is descriptive research, but in certain cases it is used for analytical research or exploratory research combined with descriptive research, or explorative with case control or crosssectional [3].

5.1. Description of Sampling Locations

The research location is the Western Dump Area (revegetation from 1993 to 2012). Administratively these locations are in the Mining Business Permit (IUP) area, PT. Karbindo Abesyapradhi in the Jorong area of the Tambang River, Parik Rantang Minute Nagari, Kamang Baru District, Sijunjung Regency, West Sumatra Province.

Sampling locations for each revegetation year from 1993 to the present (see appendices III and IV), are also distinguished by locations with monoculture sengon planting and monoculture acacia planting locations that have been reforested according to the age of growing greening plant communities and conditions control as a comparison.

5.2. Research time

The research was carried out on ex-coal mining land planted with Sengon and Acacia trees in the Mining Business License Area (WIUP) of PT. Karbindo Abesyapradhi located in Sijunjung Regency, West Sumatra Province in July to November 2012

6. Research Parameters

6.1. Physics Analysis - Soil Chemistry

Physics quality parameters - Soil chemistry analyzed in the laboratory includes texture, volume weight (BV), pH, C-organic, N - amount, available phosphorus, available potassium, available magnesium and CEC.

6.2. Profile of Cover of Greening Plants

The intensity of coverage of all stands against the surface of the land below. By looking at the number of trees, the density, the average tree diameter and the type of tillers and growing below which is below the stand, it is expected to further illustrate the adaptability of acacia and sengon plants, as well as see the level of soil fertility.

6.3. Physics Quality - Soil Chemistry

Tools used such as hand drills or hoes and sample bags (plastic bags), while the materials needed are stationery.

6.4. Profile of Cover of Greening Plants

The tools used include meters, while the materials needed such as stationery and paper millimeters.

7. Research Location

Geographically the mining business permit area of the production operation of PT. Karbindo Abesyapradhi is in a position 101020'30''-101022'40'' East longitude and 0049'30''-0052'13,8'' South latitude. Administratively it is in the Sungai Tambang Village area, Rantang Trench, the concern of Sijunjung West Sumatra Regency with the area of mining business permit for production operations \pm 2000 Ha (See Figure 1. Map of OP IUP).

The location can be reached from the City of Padang past Solok - Sijunjung Kiliranjao, with a distance of 165 Km. This location can be reached within \pm 3 hours by road (Trans Sumatra Road). From Kiliranjao to the location of PT. Karbindo Abesyapradhi is \pm 11 Km away, condition of class III paved road (Street of Teluk Kuantan).

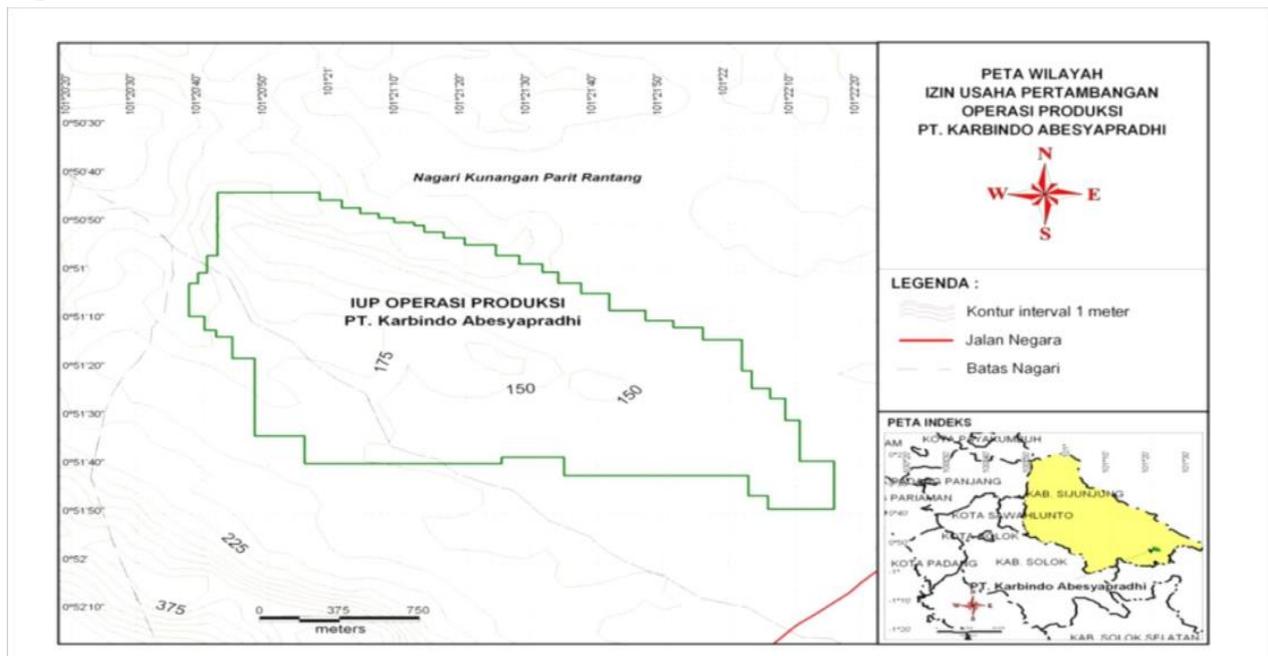


Figure 1. Map of Production Operation IUP of PT. Karbindo Abesyapradhi.
(Source: [4])

8. Coal Mining Activities PT. Karbindo Abesyapradhi

The mining system carried out by PT. Karbindo Abesyapradhi is using a surface mining system with a pit pit method. The application of open mining methods is adjusted to the calculation of layers of coal reserves with slopes, while the back-filling method serves as an effort to reduce the area of land that is open due to mining activities, so that stockpiling activities are in line with the movement of active mining operations.

8.1. Overburden Transport and Stockpiling Disassembly

Land excavation and soil transfer work is the beginning of mining activities. Amdal document PT. Karbindo Abesyapradhi explained the volume of the soil layer that was excavated and moved requires a separate place so that it does not cause problems. Overburden which is dug up will be deposited in a separate place. The location of a waste dump area (outside dump) is between 600 - 1,200 m from the mine area (pit area). Overburden dismantling is done using blasting, because the material is so hard that it cannot be disassembled directly (free). From detailed geological exploration, overburden that requires 100% blasting. Demolition using free digging or blasting still takes into account geotechnical considerations, so that it follows the predetermined pit area configuration.

To maintain slope stability at the present location, there are corner benches (either single bench or multi bench), the northern pit area ranges 55°-65°, high bench 10,0- 50,0 m, work width 20-40,0 m, and for slope angles, both single bench and multi bench pit areas in the southern part range from 300-450 (overall 300), bench width 15,0 m, bench height 10,0-20,0 m, working width 20,0-40,0 m. In some parts of the angle the slope is not stable, because it is the floor of the coal seam.

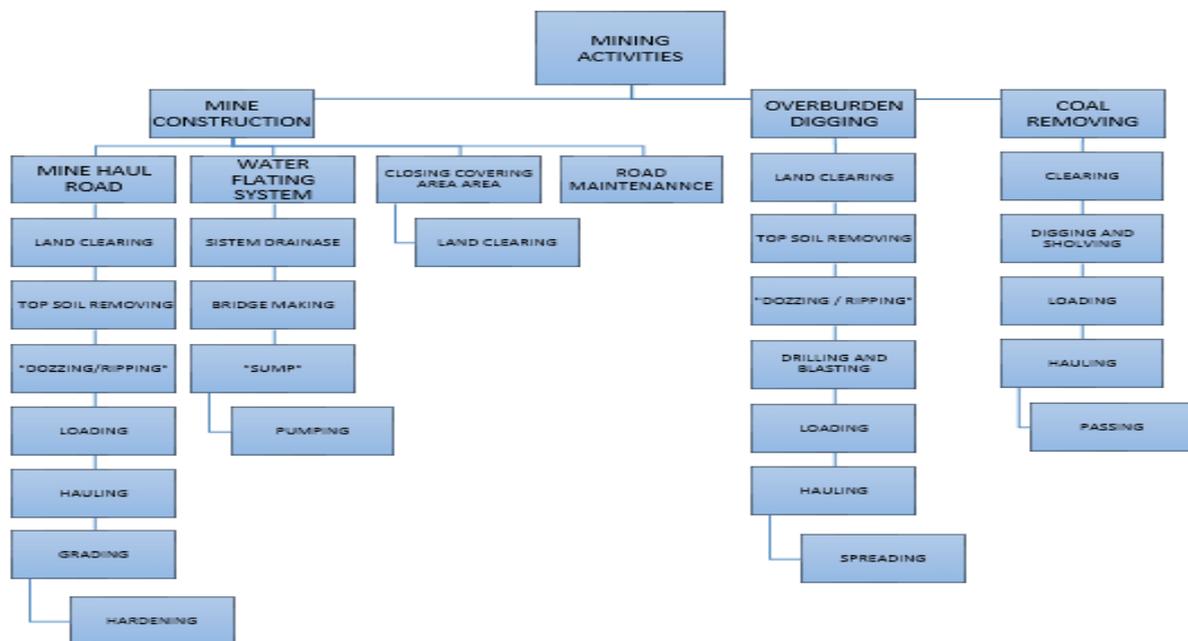


Figure 2. Mining Activities of PT. Karbindo Abesyapradhi. (Source: PT. Karbindo Abesyapradhi)

8.2. Coal Excavation, Cleaning and Loading

A steep slope coal layer and consists of several partings excavated mechanically using a heavy equipment (excavator). To do this, surface cleaning and coal breaking are done by cutting the top of each parting the act of destroying coal from side rocks or parting which is thick enough can have a negative impact on the quality of coal. This coal cleaning work uses a digging tool with a smaller capacity by a qualified operator. Then the coal is arranged into two piles, clean coal and dirty coal, then ready to be loaded into the conveyance. Coal is mined in a series of horizontal terraces; the overburden is dug first to facilitate the extraction of coal seams. Then, loaded and transported to the run of mine (ROM), then processed dryly in a coal processing plan (CPP) with a capacity of 100 MT per hour and then coal products are stacked in the stockpile area. Coal products are transported to the stock pile of gulf of Bayur Padang port. The utilization of the said land space is rented with PT. PELINDO II gulf Bayur Padang Branch (See Figure 4.5. Flow Chart Mining Process).

9. Type of soil

The results of laboratory analysis of the Land Research Station and Agro-climate of the Balitbang Department of Agriculture, Bukit Tinggi, found two types of soil found in the project area, namely Latosol and Podzolic soils. Soil Type Latosol is found in areas with choppy physiography to bump, even to the top of the hill. From the observation of the physical properties of the soil, it is known that this area has a texture of sandy clay to sandy clay loam (See Table 4.1. Results of Soil Texture Analysis). Soil fertility is very instrumental in supporting the growth of vegetation, especially when land reclamation and natural succession of vegetation that grows on the soil, Assessment of soil fertility is done by taking into account determinants such as pH (H₂O), C, N, C / N, NTK and saturation bases, which are seen in locations that are considered to represent the project area.

Table 1. Results of Soil Texture Analysis

NO.	Type of Analysis	LOCATION						
		P1	P2	P3	P4	P5	P6	P7
1.	Sand	24,67	5,5	38	24,5	32	40,25	7
2.	Ash	47,67	42	35,25	32,8	37,25	33	38,6
3.	Clay	31	52,5	23,3	42,7	30,8	26,8	49,6
4.	Organic ingredients	1,7	1,57	0,79	0,92	1,68	0,65	1,07

Information:

- Location P1 = at Pit B
- Location P2 = at Pit A
- Location P3 = Rear Base Camp
- Location P4 = Reserve Forest
- Location P5 = near washing
- Location P6 = Downstream of the River Mine
- Location P7 = Drill well



Figure 3. Flow Chart Mining Process.

Source: In the Mineral and Coal Engineering and Environmental Rectorate, Directorate General of Mineral and Coal, Department of Energy and Mineral Resources

10. Physical and Chemical Properties

This data shows the occurrence of chemical dynamics that are not uniform between parameters one with other parameters. The description of each parameter can be explained below:

10.1. Textured clay content

Some types of land are land planted with acacia trees, sengon trees and natural land which is not planted with vegetation, so the soil pH results are obtained as follows:

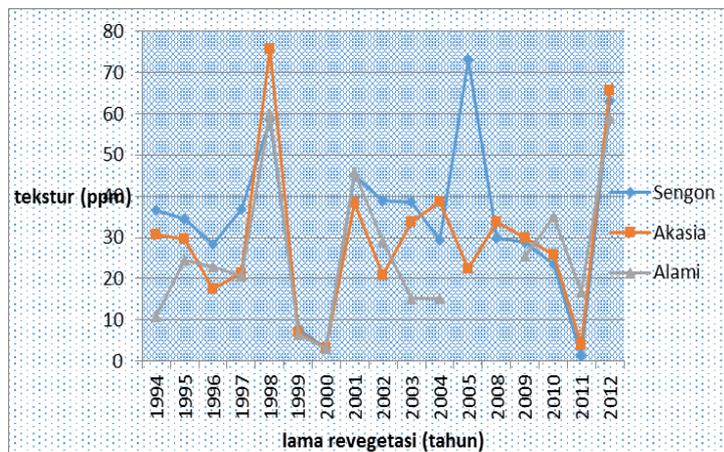


Figure 4. The results of examination of clay texture content at the Coal Mining location of PT. Karbindo Abesyapradhi in 1994-2012.

Source : Author documentation from software Microsoft Excel

The results of the examination of the content of upright clay texture of sengon trees in the reclamation area decreased in 3 years, because the process of draining by rain water, then increased sharply in the 5th year because the tree canopies had begun to tighten so that the sloping process was reduced and decreased in the following years due to decomposition of sarasah occurs. Whereas in the acacia tree stand there was an increase in the 5th year and then sharply declined the following year. Based on the graph above, it can be seen that clay content in natural areas or not planted with vegetation tends to be under the land planted with vegetation.

10.2. Soil pH

Some types of land are land planted with acacia trees, sengon trees and natural land which is not planted with vegetation, so the soil pH results are obtained as follows:

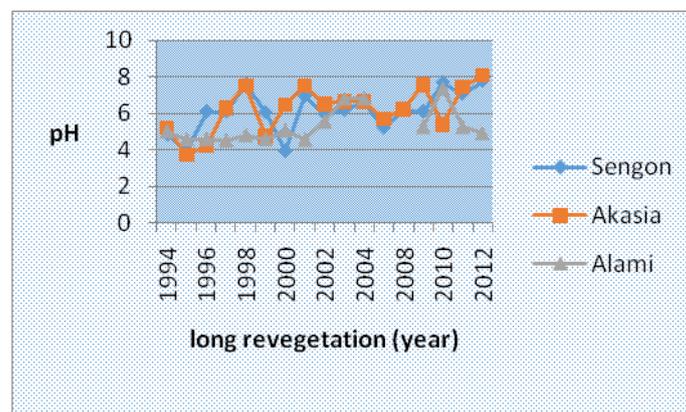


Figure 5. The results of examination of soil pH content at the Coal Mining location of PT. Karbindo Abesyapradhi in 1994-2012.

Source : Author documentation from software Microsoft Excel

The results of soil pH examination in vegetation and natural areas showed that the soil pH content in the reclamation area tended to be alkaline since the 2nd year even though in certain revegetation years there was a decrease in pH both in the stands of sengon and acacia vegetation. Whereas the pH of the soil in natural areas or not planted with vegetation tends to be acidic, this is because the natural soil base is Red Yellow Podsolc or Red Podsolc low pH.

10.3. Ca soil content

In some types of land, namely land planted with acacia trees, sengon trees and natural land which is not planted with vegetation, the resulting Ca soil content is obtained

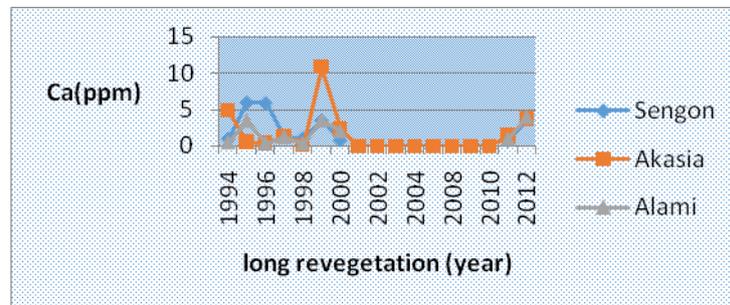


Figure 6. The results of the examination of the Ca content of the land at the Coal Mining location of PT. Karbindo Abesyapradhi in 1994-2012.

Source : Author documentation from software Microsoft Excel

Based on the picture above, it can be seen that the Ca content of the land planted with acacia vegetation has increased in the 6th year, because laboratory analysis results tend to continue to increase, from 2001 to 2011 cation exchange rates such as Ca, Mg, Na, K and CEC monitoring parameters for analysis is not taken anymore. While the Ca content in the natural area is lower than the area planted with acacia and sengon vegetation.

10.4. Mg Soil Content

In some types of land, namely land planted with acacia trees, sengon trees and natural land which is not planted with vegetation, the soil Mg content is obtained as follows:

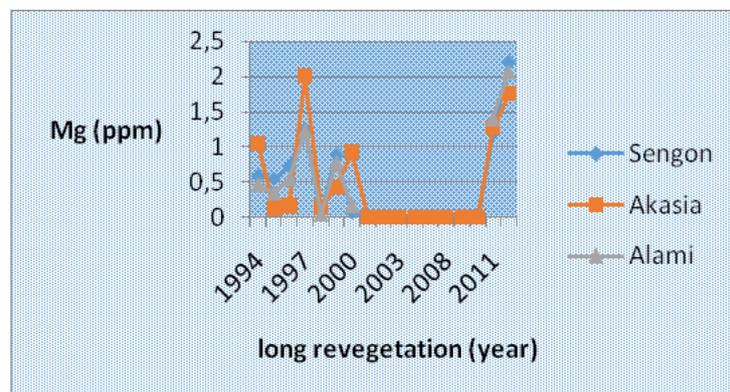


Figure 7. The results of the examination of the soil Mg content at the Coal Mining site at PT. Karbindo Abesyapradhi in 1994-2012.

Source : Author documentation from software Microsoft Excel

The results showed that the soil Mg content in the reclamation area decreased year 2 to year 8 but there was an increase in the 15th year for both sengon and acacia vegetation stands. While the content of soil Mg in natural areas tends to be lower than in areas planted with sengon and acacia vegetation

11. Discussion

11.1. Clay Texture

The results also found that the longer the life of the mine the texture of clay tends to decrease. In this case, the relationship between texture and soil structure to plant growth is very close, there is a

reciprocal relationship between components one with the other components. Plant growth can be influenced by texture and soil structure. In soil conditions that have the dominant texture of sand, the binding capacity of the soil to water and other organic materials is small. Soils with the dominant texture of sand tend to easily release the nutrients needed by plants. In a soil condition like this, the growth of plant roots will develop well. Easy root to penetrate into the soil. Drainage and aeration in the texture of the dominant sandy soil is quite good, but the texture of this soil tends to easily release the nutrients needed by plants.

For good plant growth, soil with aeration, drainage, and the ability to store water and good nutrients must have a balanced component of sand, dust and clay. So that plants can grow in optimal conditions. In addition to soil texture, another factor that has a close relationship with plant growth is soil structure.

As a result of plants experiencing growth, it turns out that plants can cause the formation of soil structures. With the presence of plants, aggregation of the soil will be formed into a more stable structure. Plants can reduce soil damage due to rain, so nutrients can be maintained and available to plants and microorganisms that live in the soil. From this description, the relationship between texture and soil structure to plant growth is related to one another. Without the texture and soil structure that is good for plants, plant growth is less optimal. Because, there are factors that limit plant growth due to unfavorable texture and soil structure. If the state of the texture and structure of the soil is in a steady state, then these factors can be overcome. In addition, the presence of plants on the ground seems to be able to help the formation of soil structures. This is caused by the existence of a root system found in the soil that is able to form natural divisions. Thus, the binding capacity of the soil increases with each other.

11.2. Mg content

The results showed that the soil Mg content in the reclamation area decreased in the second year to the eighth year but there was an increase in the 15th year for both sengon and acacia vegetation stands. This is caused by plants that are around acacia and sengon trees that have grown, the plants are rather large and weathering occurs. It means that we can see the availability of magnesium due to the weathering process of minerals containing magnesium. Furthermore, as a result of this process, magnesium will be free in the soil solution. This condition can cause magnesium to disappear with percolation water, magnesium is absorbed by plants or various other living organisms and absorbed by clay particles and deposited into secondary minerals. Availability of magnesium in soils that have high acidity and will decrease due to loss from the soil. Loss of magnesium is the same as calcium, such as erosion, due to washing and transporting plants or other living organisms.

12. Physical countermeasures

The application of plant rehabilitation methods creates a balance between human intervention and ecosystem efforts to design their own environment (self-design). This self-design provides benefits in terms of providing survival in the initial conditions of the growth of rehabilitation, stabilizing the condition of the forest after the initial phase of rehabilitation, and all of this requires costs. The types found in the location of the study are the location of PT. Karbindo Abesyapradhi as there are associated plant species in each greening area, for example, we take the example in the South E area because these plants can indirectly symbiosis with nitrogen fixing bacteria, have strong roots, and produce a lot of litter, such as: *Eupatorium conjugatum* (kerinyuah), *Lee indica*, *Sida rhombifolia*, *Piper aduncum* (betel-siriah), *Canarium sp*, *Zingiber sp*, *Merremia sp*, *Laportea sp* (Jilatang), *Syzgium jambos* (Jambak), *Clausena excavata* (sicerek), *Alocasia esculenta* (taleh), *Grewia sp* (madang), *Litsea sp*, *Mucuna sp* (aka lilik), *Ficus lepicarpa* (aro), *Abelmoschus sp*, *Cyathea sp* (nail bareh) and other suitable types (See attachment 2 Data on Observation of Flora).

Besides that, the presence of organic C is used by the function of the soil in meeting energy needs. The function of the soil is the microbes that can best adapt to the changing environment conditions, such as in mining lands that are degraded compared to soil microbes from other groups.

13. Economic countermeasures

Most of the inhabitants of the Nagari region around the location of PT. Karbindo Abesyapradhi works for the average company earning income as shown in table E. 2.1 below:

Table 2. Compilation of Number of Manpower PT. KA (End of December Condition for 2013 Working Year)

NO	LABOR QUALIFICATION	TOTAL (PEOPLE)	INCOME (Rp. Jt)
1.	Operations	147	Rp. 3.500.000,00
2.	Supervisor	34	Rp. 8.000.000,00
3.	Administration - Office Workers	27	Rp.4.500.000,00
TOTAL		208	

In addition, there are also various service businesses currently developing. The compilation of data collection results can be seen in Table E.2.2 below.

Table 3. Compilation of results of community livelihood data collection

NO	NAGARI REGION	LIVELIHOODS AND AMOUNT OF POPULATION (SOUL)				
		Farmer	trade	PNS/ABRI	Private	Services
1.	Kungan Parik Rantang	3.113	534	71	58	66
2.	Kamang	4.733	381	158	121	72
3.	Muaro Takung	330	216	82	32	45
TOTAL		8.176	1.131	311	211	183
PERCENTAGE		81,66	11,30	3,11	2,11	1,83

In addition to the Jorong Sungai Tambang I region (the location of PT Karbindo Abesyapradhi's coal mining business activities), currently various activities or economic activities of the community are developing rapidly. This indication can be seen from the existence of new stalls, new shops and the growth of shop houses (shophouses) that are used for trade services, both in the Parik Rantang Nagari Kunangan Market (the Sungai Tambang market had previously been moved) as well as in the Kiliran Jao road section - Teluk Kuantan (Jorong Parik Rantang and also Jorong Kamang). The development of said economic activities is not fully related to the existence of PT. Karbindo Abesyapradhi, but also the impact of the existence of other businesses such as plantations and palm oil mills of PT. Bina Pratama Sakato Jaya.

14. Social Response Efforts

As the government program returns to Nagari, all the social components of a Nagari community (including Ninik Mamak) play a role in regional development. In accordance with the prevailing government order, the control of all-natural resources in a Nagari including land and permits is the full authority of Ninik Mamak. In addition to settlements and agricultural businesses, land use that has developed around the location of PT. Karbindo Abesyapradhi includes fields, gardens and most of them are still in the form of forests. Field commodities such as corn, soybeans, long beans, peanuts, chillies and so on, while the garden products are dominant types of rubber and oil palm. Compilation of land use can be seen in Table E.3.1 below:

Table 4 Compilation of Land Use According to Nagari Region Around the Location of PT. Karbindo Abesyapradhi (End of Year 2013)

NO.	LAND USE	NAGARI REGION					
		Kunangan Prk Rantang		Kamang		Muaro Takuang	
		Area (Ha)	%	Area (Ha)	%	Area (Ha)	%

1.	Settlement	28,0	0,36	111,0	0,59	43,5	0,77
2.	Rice fields	34,0	0,43	136,0	0,72	168,0	2,98
3.	Field	734,0	9,32	2.043,0	10,85	1.429,0	25,37
4.	Garden	5.733,0	72,83	2.594,0	13,77	1.800,0	31,96
5.	Swamp	1,0	0,01	1,0	0,01	4,0	0,07
6.	Bush	342,0	4,34	655,0	3,48	1.051,0	18,66
7.	Mining	119,0	1,51	305,0	1,62	3,5	0,06
3.	Forest / Thicket	881,0	11,19	12.987,0	68,96	1.133,0	20,12
TOTAL		7.872,0	100,00	18.832,0	100,00	5.632,0	100,00

In accordance with the ethnicity that grew and developed in the residential area around the coal mining business location of PT. Karbindo Abesyapradhi, the prevailing customs are Minangkabau (more dominant), Javanese and Batak (especially in the social environment of the Tambang River and Tanang River communities). Although the ethnicity that developed in the Sungai Tambang area is heterogeneous, assimilation between ethnic groups - including cultural or traditional assimilation - has taken place in harmony. So, until now there has never been an inter-ethnic social conflict. Furthermore, from the results of monitoring, it is also known that through the local community development program a harmonious relationship between one another has been created between PT. Karbindo Abesyapradhi with members of the local community.

PT. Karbindo Abesyapradhi is committed to making sustainable development very important, this is reflected in what the company does in the form of community empowerment. Moreover, of course it will risk the name of the company to get and maintain permits especially socially in conducting its operations in the community. At this time the mining industry has realized that to gain access and maintain its reputation must certainly be able to demonstrate its ability to conduct mine closure and effectively gain support from stakeholders, especially the communities where the mine operates. The expectations of existing regulations and stakeholders are getting higher, so that to get maximum results, a good and right method is needed.

15. Conclusion

The conclusions obtained from the study of the suitability of Sengon and Acacia Plants for Reclamation of Former Coal Mine in PT. Karbindo Abesyapradhi - Sijunjung Regency is as follows; There is no difference in soil fertility status or chemical content (clay texture, acidity, Ca content, Mg, soil potassium, soil CEC, C-organic soil, N-total soil) on both sengon and acacia tree vegetation growth. Partially affecting the growth of plants, both Acacia and Sengon trees, are Cation Exchange Capacity (CEC) and soil texture.

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