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Determination of the Location of the Limestone Processing Industry in Malang Districts

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ABSTRACT: Malang Regency has the potential for limestone mining and currently there is still not much use. This study was conducted with observations and criteria determining the industrial location for limestone processing. the research variables are raw materials, production, labor, markets and road pavement conditions, with weighting and suspension methods. From the results of the study, the location was chosen as the location of the limestone processing industry, namely Argotirto Village, which is a location close to raw materials and processing processes and is supported by adequate road pavement conditions.

KEYWORDS-location, limestone, potensial

INTRODUCTION

For its use, limestone is used as the main raw material in the processing process of the cement industry, plasterboard industry, lime industry, one of the materials in building construction and other industries that use limestone as the main raw material. Based on the Indonesian Industrial Standard, the cement industry requires limestone with a CaCO3 content of ± 85%. This shows that limestone plays an important role as the main raw material. Malang Regency is one of the areas that has abundant limestone potential, this is because most of the limestone presence is spread in each area of Malang Regency. Based on research from the Mineral Resources Energy Service in 2008, Malang Regency has a limestone content of 1,951,820,050 m3 spread across Kalipare District, Gedangan District, Donomulto District, Sumbermanjing Wetan District, Pagak District, and Bantur District. From the data on the potential of C excavated material in Malang Regency in 2018, the limestone resources that have been measured, for Sumbermanjing Wetan District have the largest limestone content of 871,454,500 m3, compared to 5 other districts, with a mining area in Sumbermanjing Wetan District, which is ± 5,400 Ha. By paying attention to the distance of the location of the transfer of raw materials (raw materials) which will take quite a lot of time, it is feared that it will affect the level of production, where the production is used as industrial raw materials, which in turn will reduce the income level of people who make a living as miners. Thus, it is necessary to have an industrial location as a center of activity that has a number of units of industrial activity using the same means, produces similar products and has prospects as a center for the development of these activities. The study is aimed at determining the appropriate location for the limestone processing industry.

RESEARCH METHODOLOGY

For analysis methods by conducting several approaches using qualitative and quantitative descriptive methods. The research stage is the analysis of limestone potential sourced from the results of interviews with entrepreneurs / mine owners, survey results and related agencies. For the calculation of the analysis of the availability of raw materials, it is used to determine the availability of limestone in the long term as raw material for the limestone processing industry. Then analyze the determination of the location of the industry based on the level of importance and adjusted to the conditions in the field. The steps taken are to analyze scoring using variables of raw materials, production, accessibility, market, and labor. In the process of weighting and scoring, the summation of the weighting will then output the output of the selected location results.

RESULTS AND DISCUSSION

This limestone processing industry produces limestone that has been inventoried / cooked which then sells it to consumers either through orders or directly. The limestone processing process in the study area has a different way, namely processing that is

carried out traditionally and modernly because the processing process is influenced by consumer demand using limestone. The limestone processing process carried out in the traditional way is in every village, but for Sumberagung Village, it produces more raw materials than processing. The traditional process and the modern process are almost the same in producing the final product but which becomes different in the combustion / heating process, in the traditional process using sawdust this is because the limestone maturation process is more really cooked because its use is used for limestone and bleaching materials. As for the modern process, the heating is carried out using wood, this is due to the increasing consumer demand. The amount of production carried out is inside the village, outside the village and outside the district.

The three villages have different production processes, where for Druju village and Argotirto village use the production process using machines with materials for burning in the form of wood so that the amount of production produced from industry in Argotirto village is 30 tons / day and Druju village is 35 tons / day, while Sumberagung village uses a manual (traditional) burning process with sawdust and produces a total limestone production of 15 tons / day. Themajority of the work for the limestone processing industry resides around the industry. The workforce comes from Argotirto Village with a total industrial workforce of 25 people and the lowest from Sitiarjo Village with a total of 3 industrial workers. Marketing data on limestone processing obtained from 3 limestone industry business owners in Druju, Sumberagung and Argotirto villages, which have recapitulated sales / orders to consumers both outside and within the Sumbermanjing Wetan district in the last 5 years.

Analysis of limestone potential consists of the process of forming limestone in Malang Regency which previously experienced a sedimentation process, where this sedimentation process occurs due to the presence of marine plants (colonies of foraminifera animals, algae and other species) that have died and been deposited on the seabed with calm sea conditions. Limestone that occurs due to chemical sedimentation occurs due to chemical processes that take place continuously in the vast ocean with solutions contained in it, which chemically contain calcium carbonate (limestone content based on data from the ESDM Office, Malang Regency, Limestone content CaO, SiO2, AI2O3, H20, Fe203, Fe 2 0 3, Na20, MgO). Based on the results of observations, the color of limestone in the study area is brown white (dirty white), hard and has small cavities. For indicators of raw material availability, namely for forecasting reserves for the future, it is still 45 years (Druju Village 24 years, Argotirto Village 6 years, Sumberagung Village 15 years). For mining techniques Based on the results in the field, the mining conditions carried out still use blasting, which is used to dismantle the excavated rock / material from the parent rock, after that, carry out dredging. This resulted in the blasting technique being a lack of supervision on the part of the government and resulting in a lack of work safety.

The analysis of determining the location of the limestone processing industry is the calculation of the classification of the selected location hierarchy based on the number of scores on each variable of the location of the limestone processing industry using weighting and scoring, so that the highest hiarchy value is the selected location. The closer the location of the raw materials, the smaller the transportation costs of both raw materials and finished goods, so the price of limestone products will be more affordable. Meanwhile, when compared to the location of raw materials, it will affect the decline in the level of limestone production. The score scores are arranged based on the class of a certain interval. Where for the selected location hierarchy classification score value uses the interval class range of 21 for each addition of the score value, while for the number of values the selected location hierarchy.

Table 1. Determination of selected locations

No.	Village	raw materials			Production			Workforce			Road Conditions			Market			Total value	Location Hierarchy
		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C		
1	Sb.Manjing Wtn	5		50	2		16	3		18	7		28	2		4	116	III
2	Harjokuncaran	3		30	2		16	3		18	6		24	2		4	92	IV
3	Argotirto	4		40	8		64	4		24	5		20	3		6	154	I
4	Ringinsari	2	10	20	2	8	16	2	6	12	6	4	24	4	2	8	80	IV
5	Sitiarjo	3		30	2		16	1		6	7		28	4		8	88	IV
6	Sources	8		80	2		16	2		12	4		16	4		8	132	II
7	Ringinkembar	2		20	2		16	2		12	5		20	3		6	74	IV
8	Druju	4		40	6		48	2		12	5		20	7		14	134	II
Sum		33	**10**	**343**	**30**	**8**	**240**	**20**	**6**	**120**	**45**	**4**	**180**	**29**	**2**	**58**	**908**	-

description : A = Score

B = Weight

C = Value

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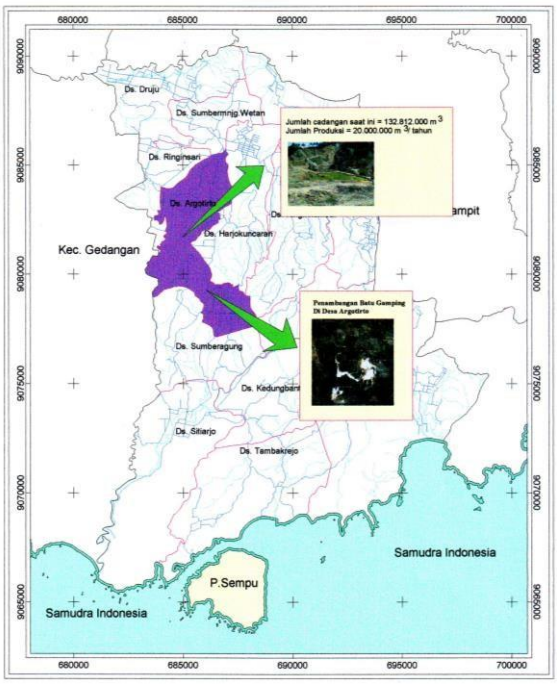
In the table above, the value of the selected location is obtained from the final result score on each variable multiplied by the selected weight, where the selected weight is obtained based on the level of importance. Theraw material variable obtained the highest score value of 80 in Sumberagung Village and the lowest score value of 20 in Ringinsari Village and Ringinkembar Village. For the production variable, the highest score was obtained at 64 in Argotirto Village, and the lowest score value was 16 in Sumberagung Village, Sumbermanjing Wetan Village, Harjokuncaran Village, Sitiarjo Village, Ringinsari Village, Ringinkembar Village, and Druju Village.

Meanwhile, for other variables, namely the variable number of workers, the highest score of 24 was obtained in Argotito Village, and the lowest score value of 6 in Sitiarjo Village. For the road condition variable, the highest score was obtained at 28 in Sitiarjo Village and Sumbermanjing Wetan Village, while the lowest score value was 16 in Sumberagung Village. As for the market variable, the highest score value was obtained at 14 in Druju Village, and the lowest score value at 4 in Sumbermanjing Wetan Village and Harjokuncaran Village.

Based on the results of the total value of the selected location hierarchy, it is obtained from each number of scores on each variable, so that a total value is obtained. Then the total values are grouped according to the hierarchical classification of selected locations (in table 3.18). So the highest total score was obtained, which was 154 in Argotirto Village as the I-th location hierarchy. From the analysis above, the village that has the highest value and is the priority of being selected is Argotirto Village.



selected location on Argotirto Village

CONCLUSIONS

Based on the results of the analysis of the availability of raw materials, for limestone it is estimated that up to 24 years this is sourced from data from related agencies, but when viewed from conditions in the study area, there are still limestones whose reserves are still unknown. And the analysis of determining the location in Sumbermanjing Wetan District for the scope of the Village using the scoring and weighting method, the selected location is Argotirto Village with the highest number of score scores of 154. So that Argotirto Village is suitable for the location of the limestone processing industry, by having the potential for raw materials and production processes that can streamline limestone production results, having the highest number of limestone orders and the number of workers, and supported by adequate road pavement conditions.

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