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## Economic Impact Valuation Events Excavation C Mining on Welfare Society in the District North Aceh

## KEYWORDS

economic, impact, mining excavation c, public welfare

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## ABSTRACT

This study aims to determine the impact of the economic valuation of mining quarrying C on livelihoods in North Aceh district, so that mining does not support the sustainability of the future can be reduced and could improve the welfare of the community. The study as conducted in several districts in north Aceh province. Observed parameters there are several variables, work opportunities, environmental degradation, and social welfare. This study also uses a regression model to see the effect of the economic valuation of the environmental impact of mining on public welfare, and the value to be paid by employers in local government method calculating unit costs of production and rent. The results showed that the impact of mining activities quarrying C consists of variable work opportunities has a positive effect on the welfare of the community, while environmental damage showed negative effect on the welfare of the community in accordance with the proposed hypothesis. And the results of the feasibility citations Rp 87.000/truk cost of sand and coral at a cost to Rp. 137.500/truk while for the cost of Rp. 137.500/truk gravel. Regression model showed that the variables work opportunities demonstrate the effect by 48%, while the effect of environmental damage by 57% against the public welfare. While the total effect of the two variables work opportunities, environmental damage to the welfare of society is at 72%. Thus the welfare of the people by the influence of the impact of mining activities have positive effect.

## BACKGROUND

Total demand mankind universal feast on natural resources and environmental services in the world, especially in Indonesia has exceeded the carrying capacity of the earth to provide (produce) all the natural resources and environmental services, while the number of residents as well as people's income increases (Wackernegel in Dahuri et.al. 2012). Therefore, the demand for goods and services in the future will continue to increase as well which can not be met again the results of the utilization of natural resources. To achieve the optimal use of natural resources is necessary to balance the environment and natural resources requires economic assessment (economic valuation) to reserve the use of natural resources and also directed how the effective management of these resources and efficient possible without reducing resources for future generations (sustainable development).

Development in an effort to improve the welfare of society, is basically the utilization of natural resources and environmental changes that will have an impact on the environment. Therefore, patterns and ways of build up that will determine the amount of impact it will have on the environment (Djajadiningrat, 2011).

Mining activities which are technology-intensive activities and capital intensive, is a source of foreign exchange. Economic cycle at the time the project is certainly going to stimulate growth-related sectors of the economy. Available and work opportunities for local people despite the presence of immigrant communities to participate in the competition can not be avoided. With the inclusion of a wide variety of cultures and ways of life that everyone is involved in the mining project, will gradually affect the pattern of social and cultural life of the local community (Rissamasu, et al., 2012). Mining business activities will be able to generate positive impacts and negative impacts ascertained. Positive impact in the form of increased community prosperity, creating job opportunities, the emergence of new economic activities should be developed. And negative impacts can take the form of pollution and waste, can cause diseases, the onset of

dust and noise and environmental damage in the social and cultural (Sukandarrumidi, 92:2010).

Law on Governing Aceh (Law PA) This will be a legal framework for the implementation of decentralization and autonomy as well as attention to sustainable development and environmental conservation in Aceh, in the future development needs to be seen how to build a reciprocal relationship between humans and the natural components should take place within the limits of the balance, if reciprocity is accomplished not balanced, it will result in the physical environment, economic, social and cultural (Sumarwoto,1991).

North Aceh Regency is one of the districts with the mining excavation C in Aceh province, is inseparable from the use of minerals sector Actively C for development is so rapid today. Currently, the excavation area C in the North Aceh Regency reached 187.81 hectares located in the 9 point spread excavation site

Table 1. Development of Income Tax Collection and Excavation Materials Class C excavation in North Aceh Year 2007 - 2011

Year	Restribusi of Area	Goals	Realization
2007	Restribusi Permit of is Effort Mining of Substance of faction C.	5.000.000,-	5.780.000,-
2008	Restribusi Permit of is Effort Mining of Substance of faction C.	6.000.000,-	3.477.000,-
2009	Restribusi Permit of is Effort Mining of Substance of faction C.	8.400.000,-	9.248.160,-
2010	Restribusi Permit of is Effort Mining of Substance of faction C.	21.454.000,-	18.461.400,-
2011	Restribusi Permit of is Effort Mining of Substance of faction C.	57.600.000,-	14.022.600,-

Source : DPKKD of regency of North Aceh , 2012.

Under these conditions, the problems encountered include the problems include:

- Is work opportunities, environmental degradation influence on the welfare of the people in the district of North Aceh.
- How indirect influence work opportunities in community welfare through environmental degradation in the district of North Aceh.
- How does the total effect of variable mining quarrying C on livelihoods in the district of North Aceh
- What is the value to be paid to the government as an agent employers who consider the public interest and the preservation of nature and environment resource
- How the public perception of mining environmental management policy excavation C in future

#### THEORETICAL BACKGROUND

Environmental impact of mining activities result sand, gravel and stone quite intensively conducted especially in the country of which (Yudhishthira, 2008). Factors that cause high levels of erosion due to sand mining is not pay attention soil conservation and land as well as geographical and geological factors research area. Allegations of erosion that occurs on sand mining area is total conjecture erosion 8766076 tons / year. erosion hazard levels based Decision Department Reforestation and Rehabilitation Department of Forestry No.041/Kpts/V/1998 is moderate and mild.

(Rissamsu et al 2012) results of research on management of mining minerals category C, describes the outline can be divided into several activities, namely the determination of the location of sand mining, reclamation / rehabilitation of land after mining, erosion control. The final goal of mine is to address existing environmental damage, control soil erosion and improve the welfare of the community.

1. Management of material Class C mining is done by granting both employers and owners of customary rights. Socialization is done on the importance of the mining license for pressing environmental damage, especially on the populace mining entrepreneur (without permission) spread
2. There is no special area for mining minerals group C because there is no inventory of mining areas, there are no local regulations, and related agencies to focus on the energy sector
3. Inventory in the mining business, licensing, mining is still focused on the element of tax revenues and user fees, Environment Management Effort (UKL) and Environmental Monitoring Effort (UPL) has not been a requirement for Employers miners
4. Factors that affect the management of which is no local regulations, human resources personnel, economic status and education level.

Mining industry in addition to bring in foreign exchange and employment siphon also vulnerable to environmental degradation. Many mining activities that invite the public spotlight due to destruction of the surrounding environment, especially mining without permission is in addition to damaging the environment also endanger the lives of miners due to limited knowledge of the miners and also because of the lack of oversight of the department related institutions (Yudhishthira, 2008).

Impact is the result of an activity such as construction. The impact of this building have emerged due to the beneficiary (gainers) and losers (losers) then assessment socio-economic impacts also need to refer to those who are advantaged and disadvantaged (Soekartawi, 1995:140).

Rissamasu et al. 2012 Mining of minerals stated category C, it will result in 2 Impact on are asof development, namely positive and negative impacts.

#### Positive impact

The positive impact is the benefit that is derived from mineral mining group c, namely:

- Absorption of labor, that is society has a job to meet the needs of family life.
- Adding revenue (PAD) with employer obligations to pay taxes and levies mineral group C.
- Streamlining transport. Because that was just the way the population has become a viable path.

#### Negative Impact

Negative impact on the causes for the mining of minerals category C is the large holes that lead into unproductive land. So that during the rainy season the holes will become mosquito breeding causing disease in the local community. The negative impact is certainly a concern for local governments perform reclamation after mining operation send.

Pough (1976) Materials quarry is divided in many categories and characteristics such as rock sediments are referred to as "mainly a single, low temperature minerals, banded, stratified, fossiliferous and Often" from the explanation shows that the excavation C derived from sedimentary rocks with characteristics and nature is a large part single, low mineral its temperature, layered, divided into levels and easy to find Matrizal (2012), states that the environmental damage due to mining and mineral extraction C largely due to the lack of consideration of environmental issues in the planning, operation and improvement hereafter mining treatment. Environmental damage can be caused by minor surgery, a large and mechanized mining or by the cumulative effect of minor surgery performed continuously.

In the view of ecological economics, valuation purpose is not only related to individual welfare maximization, but also related to the goal of ecological sustainability and distributive justice (Constanza and Folke, 1997 in Adrianto, 2005) and Bishop (1997) in Adrianto (2005) states that the valuation based on the welfare of individuals alone do not guarantee the achievement of the ecology and distribution of justice.

Sugiarto (2007), expressing that a person's level of well-being is strongly associated with the level of satisfaction (utility) and pleasure (pleasure) that can be achieved in life. In order to achieve the desired level of prosperity, we need a behavior (behavior) that maximizes the level of satisfaction in accordance with available resources.

#### RESEARCH METHODOLOGY

##### Place and Time Research

Research carried out at the mine site excavation C in North Aceh regency of Aceh province. The experiment was conducted in a period of 6 months. September 2012 to March 2013. Location of the study can be seen in the following figure.

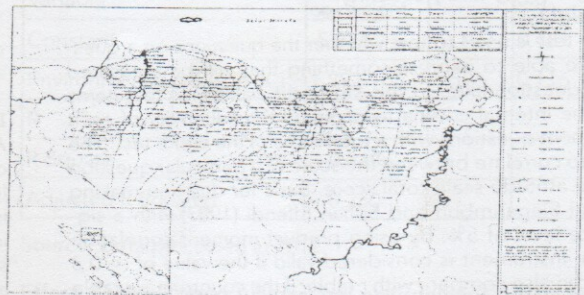


Figure 1 Location of research in the area of North Aceh regency of Aceh province.

##### Samples and data collection

Technique of determining the number of samples from each of these groups is to use the following formula Slovin (Rid-

wan,2004):

Calculation of sample size on the basis of proportional sample allocation method, then for each district or village proportional.

Tabel. 2 Proporsional Sample

No	Districts / Gampong	Respondents
1	Sawang/Blang Manyak	5
	Sawang/Babah Krueng	12
2	Kuta Makmur/Cot Meurebo	10
	Sp.Kramat/Kr.Pase VIII	7
3	Sp.Kramat/Dama	2
	Langkahan/Bola Mas	9
4	Tanah Luas/ Plupakan	2
	Nisam Antara/Darussalam	4
5	Nisam Antara/Blg Pohroh	1
	Nisam Antara/Alue Dua	10
6	Cot Girek/Alue Leuhop	15
	Paya Bakong/Matang Panyang	6
7	Nisam/Alue Bili	3
	Nisam/Meunasah Alue	10
		96

Source: Data compiled from the secretariat of the North Aceh region in 2012

The type, source and destination data retrieval

No	Data Type	Data Source	Destination
I. Primery data			
1.	Social and economic conditions, among others, education, occupation, income, number of dependents, etc.	Interview	To determine public perception of the factors to be considered in the future management of the environment
2.	Public perception in the management of mining quarrying C in the future	Interviews used a questionnaire	To determine public perception of the factors to be considered in the future management of the environment
II. Secondary Data			
3.	Socio-economic and environmental data	BPS North Aceh district, past research	to determine the location of the re-search overview
4.	Data exploration potential quarrying C and C	Relevant agencies	To determine the development of mining quarrying C

Research Variables and Parameters

The variables in this study to see the effect of the impact of mining activities on livelihoods quarrying C consists of:

1. The independent variable / independent variable (variable X) is a mining activity. Sub- variables: employment opening (X1), Environmental Damage (X2)

2. The dependent variable / dependent variable (variable Y) is the welfare society. elaboration of measurement or operational variables.

Testing Validity and Reliability

Test Validity

Validity test is used to test whether the questions on a questionnaire able to express something that will be measured by the questionnaire. In this study, the validity of test items using the internal criteria to compare the suitability of each component questions with a total score of the entire test. The trick is to correlate between the score of a particular question with the attitude scale total score. Basic for decision making by Masri Singarimbun and Sofian Effendi (1987) with a significance level of 5%. By using product moment correlation formula. Instrument is considered valid if the value of  $r > 0.3$  or you can also compare with r table, if the countruct  $>$  r table then valid.

Test Reliability

Reliability is the degree to which the variables are considered free of errors (error-free). (Ghozali, 2011). Reliability testing is one way that can be done to examine the extent to which

Data collection in this study conducted through several methods of analysis as follows:

- a. Literature study, collect materials and information about the theories and concepts in Order to explain the phenomena associate with the study variables
- b. Field study consisted of:
  - 1) Observation, that these activities are done on a temporary basis for mining quarrying C. observation is the systematic observation and recording of symptoms observed ( Singarimbun, 1982). Conducted field observations to get a real picture of the changes of the physical environment and the level of dust and noise that occurs by way of identifying the location of mining
  - 2) Questionnaire, that is by spreading the list of questions that are closed, where each question has been available 5 alternative answers, so that the respondent can just choose one of the alternative answers that are considered in accordance with the practical reality.

Scores generated by these questions ordinal level of measurement. Variables measuring devices, must be tested for validity and reliability through internal testing consistent. Items (questions) that is fitted to the group of respondents, then performed an item analysis.

measurement results are relatively stable when measured again. Reliability testing is needed for things relating to social psychology such as attitudes, behaviors and trends. In this study using SPSS 19, wherein a construct or variable said to be reliable if it delivers value alpha cronbach ( $\alpha$ )  $>$  0.60 (Nunnally, 1967). Used to measure the reliability spearman Brown formula.

Good reliability value if greater than 0.6 (pretty good), or greater than 0.8 (good)

Test hypothesis account of the cost of production

Testing this hypothesis is based result calculation of (a) the cost of regression function (b) Regression of production costs and (c) the benefits to be paid every decision quarrying C

Data Analysis

Analysis of the impact of mining activities on livelihoods excavation C, the analysis conducted for mining quarrying C on livelihoods using path analysis (path analysis). Path analysis is part of the statistical parametric requires that a minimum interval over successive intervals method (Method of Successive Interval) from Thurtone (Al Rashid, 1994: 131). Additionally path analysis, the results of this scale withdrawal from ordinal to interval is done for each item per variable.

To calculate how big assess retribution directed to use the method of calculating the unit rent. In analyzes using quantitative and statistical qualitative in view of economic value and environmental management to analyze the extent to

which the p

To assess th economic re price) is the ment as an and taking o

RESULTS AN

Results Vali

Based on th questions variable Y is in the indepe because the correlations cance level t r statistics. A contained in take a study

Table 3 : Th

Question gr

X1.1

X1.2

X1.3

X1.4

X1.5

X2.1

X2.2

X2.3

X2.4

X2.5

X2.6

X2.7

X2.8

X2.9

X2.10

Y1

Y2

Y3

Y4

Y5

Y6

Y7

Y8

Y9

Y10

Sources: Prima

which the parties in the mining excavation C Aceh .

To assess the natural resource goods can be used approach economic rents (economic rent) or also called net price (net price) is the value that should be paid back to the government as an agent that takes into account the public interest and taking care of natural resources and the environment.

## RESULTS AND DISCUSSION

### Results Validity and Reliability Test Analysis

Based on the validity of the test results showed that all the questions independent variables X1, X2 and the dependent variable Y is declared invalid. Of the 25 questions contained in the independent and dependent variables declared invalid because the value  $>$ . Corrected values seen in the item-total correlations and compared with the value at the 5% significance level that is equal to 0.202 which is seen in the table r statistics. And this shows that from each of the questions contained in the questionnaire valid and can be trusted to take a study as presented below:

Table 3 : The validity of the study variables

Question grain	r count	r table
X1.1	0,340	0,202
X1.2	0,583	0,202
X1.3	0,586	0,202
X1.4	0,681	0,202
X1.5	0,681	0,202
X2.1	0,633	0,202
X2.2	0,620	0,202
X2.3	0,575	0,202
X2.4	0,624	0,202
X2.5	0,266	0,202
X2.6	0,754	0,202
X2.7	0,472	0,202
X2.8	0,687	0,202
X2.9	0,678	0,202
X2.10	0,550	0,202
Y1	0,677	0,202
Y2	0,406	0,202
Y3	0,811	0,202
Y4	0,846	0,202
Y5	0,731	0,202
Y6	0,813	0,202
Y7	0,860	0,202
Y8	0,839	0,202
Y9	0,555	0,202
Y10	0,295	0,202

Sources: Primary data were processed in 2012

Reliability test is used to regulate the provision or fidelity instrument when used to measure the set of the same object multiple times will get similar results. Cronbach Alpha testing is used to test the level of reliability (Reliability) of each variable questionnaire. Measure is considered reliable if the alpha cronbach value  $>$  0.60. (Nunally in Ghozali (2001:23)

Table 4 Research Variables reliability (Alpha)

No	Variable	Cronbach Alpha	Number Variables	Value Alpha	Description
1	Opening employment (X1)	$>$ 0,60	5	0,769	Reliable
2	Damage Environment(X2)	$>$ 0,6	10	0,836	Reliable
3.	Welfare Society (Y)	0,6	10	0,915	Reliable

Sources: Primary data were processed in 2012

Based on the reliability test results can be explained that the three independent variables and the dependent variable has a value of Cronbach Alpha for the 0769 X1, X2 of 0836, and Y for 0915, while the value of Cronbach Alpha is 0.60 (Cronbach Alpha value  $>$  0,60). Then it can thus be explained that the measurement reliability of all constructs both free and bound variables showed that all indicators are empirically reliable. Because the value of cronbach alpha greater research variables 0.60 ( $>$  0.60) are acceptable, then the variables used in the instrument is reliable (reliable) for use in research.

### Work opportunities to influence public welfare

The estimation of the resulting impact work opportunities in community welfare can be seen the results are presented in the table.

Table 5. Estimation Results Against X1 Y

Variable	regression coefficients	t <sub>arithmetic</sub>	Sig
Constant	-9,666	-1,629	0,107
Work opportunities (X1)	2,106	5.001	0,000
R	= 0,619		
R Square	= 0,384		
Adjusted R Squared	= 0,377		

Source: Data processed in 2012

### Effect of environmental damage against welfare community

Results of regression influence environmental damage to the public welfare can be presented in the following table.

Table 6 Estimation results against X<sub>2</sub> Y

Variable	regression coefficient	t <sub>arithmetic</sub>	Sig
Constant	-5,336	-0,707	0,481
Environmental damage (X <sub>2</sub> )	1,892	1.585	0,116
R	= 0,488		
R Square	= 0,238		
Adjusted R Squared	= 0,230		

Source: Data processed in 2012

### Effect of work opportunities and environmental damage to the public welfare

To see the results of the estimation of the two variables mining excavation work opportunities and the influence of environmental damage to the public welfare can be estimated from the results of simultaneous regression or as a whole can be presented in the following table.

Table 7 Estimation result Of  $X_1, X_2$  against Y

Variabel	Regression Coefficients	$t_{\text{arithmetic}}$	Sig
Constant	-15,826	-2,635	0,010
Work opportunities ( $X_1$ )	1,756	5,001	0,000
Environmental damage ( $X_2$ )	0,634	1,585	0,116
R	= 0,632		
R Square	= 0,400		
Adjusted R Squared	= 0,387		
F <sub>hitung</sub>	= 30,979		
Sig	= 0,000		

Source: Data processed in 2012

**Indirect Influence (Indirect Effect) and Total Influence (Total Effect).**

To view the indirect effect (indirect effect) and the total amount of influence (total effect) of the estimation results of path analysis can be presented in the following table:

Table 8 Estimation Path Analysis results

Model	Path Coefficients	$t_{\text{arithmetic}}$	Sig	R <sup>2</sup>
$pX_1X_2$	0,628	7.834	0,000	0,395
$pYX_1$	0,516	5,001	0,000	0,400
$pYX_2$	0,164	1,585	0,116	

Source: Data processed in 2012

Partial results of the analysis with work opportunities, damage to the environment as the independent variable and the welfare of society as a dependent variable, it is known that significant work opportunities in community welfare 0.000 significance level ( $p < 0,05$ ). While the environmental damage effect does not significantly influence the level of social welfare non significant respectively 0,116 and 0,000 ( $p > 0,05$ ). Determinant coefficient (R<sup>2</sup>) 0,400 or 40 %.

**Effect of opening of job opportunities (X1) against public welfare(Y) through the environmental damage (X2)**

Based on Figure above shows that the indirect effects (indirect effect / IE) work opportunities (X1) on livelihoods (Y) through environmental damage (X2) is ( $pX_2X_1$ ) ( $pYX_2$ ) = (0.628) (0.164) = 0.103 . Indirect influence means (10.3%) means more and more work opportunities, will further damage the environment will eventually lower the level of social welfare. So the total effect of variable C quarrying mining activities on livelihoods is  $PyX_1 + IE = 0.516 + 0.103 = 0.618$  or 62%. It can be concluded that that the total effect of work opportunities in community welfare through environmental damage amounted to 62%.

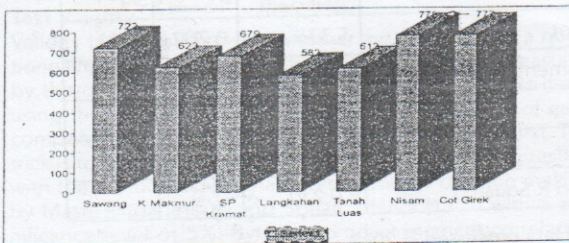


Figure:2 Data retrieval results of the regression sum c excavation at the site of the Aceh Utara district

There is another model for assessing a decent price, in other words to calculate rent units include: the market price of sand is known for Rp.350.000 / truck. In this activity have also calculated the overall production cost of Rp.270.000, - / truck

with number 4 truck loads per m3. Can be calculated unit rents for sand production activities Rp.87.500, /4m3. Thus meaning when calculated with unit percent to 25%.

The calculation of rent units in 2012 to coral Aceh district North province can be explained as follows below. As for the coral to determine the market price of Rp.550.000 / truck. In this activity have also calculated the overall production cost of Rp.375.000, - / truck, so it can be calculated unit rents for coral production activities Rp.137.500, - / truck. Thus meaning when calculated with unit percent to 25%. rent unit price calculation gravel in the province of the district are as described below as follows.

As for knowing the market price of Rp.550.000/truk gravel. In this activity have also calculated the overall production cost of Rp.445.000, -/truck, the results can be calculated unit rents for coral production activities Rp.137.500, - / truck. Thus meaning when calculated with unit percent to 25%.

From the above discussion shows that each C which assessed the excavation of sand, pebbles and gravel with each value is the value of the unit to Sand Rent to be paid by the Government as an agent entrepreneur who consider the public interest and the preservation of natural resources and the environment, namely the Sand (25%) of the prevailing market price. For rent unit assessment of coral is the element of excavation C (25%) of the sales value of C in the form of coral quarrying in the market. And for assessment of the unit rent of gravel (25%) of the sale price in the market.

**CONCLUSION**

Based on the research and discussion that has been described above, some conclusions can be drawn, as follows:

1. From the results of statistical tests turned out to influence the economic valuation of the impact of mining activities in North Aceh excavation C simultaneously affect positively to the welfare of society, and when analyzed by partial work opportunities that positively and negatively affect the environmental damage the welfare of the people in the district of North Aceh. And also can not be ignored that there are other factors that affect the welfare of the people in the district of North Aceh.
2. The direct effect (direct effect) between some variables of the impact of mining excavation C consists of a direct effect (direct effect) work opportunities to the public welfare that is obtained by (51.6%)
3. Indirect effect (indirect effect) work opportunities in community welfare through environmental damage negative values obtained by (10.3%)
4. For the total effect (total effect) work opportunities in community welfare through environmental damage are obtained by (62%)
5. From the results of research in particular are worth the price paid by employers excavation C for the Government as an agent who consider the public interest and the preservation of natural resources and the environment in the form of sand in the truck as much as 4 m3 at a price to be paid by government employers excavation on Rupiah.87.500/truk ( 25%), for the coral one truck as much as 4 m3 to be paid to the government by Rupiah.137.500/truk (25%), and C for gravel excavation of the truck as much as 4 m3 at a price to be paid by employers excavation C on the government of Rupiah .137.500/truk (25%) .
6. Of responses / perceptions for future policy, need guidance and strict rules such as law / Regulation (Regulation) which regulates mining and quarrying C Government should also promote agriculture and plantations for environmental sustainable.

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