Qualitative Analysis of Negative Impact on the Environment (AMDAL) in Toll Road Construction Projects

(Case Study: Solo – Yogyakarta – NYIA Kulon Progo Toll Road Project Section 1 Package 1.1 Solo – Klaten STA 0+000 – STA 22+300)

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Abstract:- The aim of the study was to analyze the negative impacts caused in the process of implementing the Solo - Yogyakarta Toll Road construction project and identify the negative impacts that had an effect on the community as a result of the implementation process of the Solo - Yogyakarta Toll Road construction project. The background of this research is that there are various kinds of negative impacts, such as chemical impacts, physical impacts, biological impacts, social impacts, cultural impacts and economic impacts. causing dissatisfaction with the people affected by the negative impact of the implementation process of the Solo - Yogyakarta - NYIA Toll Road construction project. The data used in compiling this research is an EIA document from PT. Adhi Karya. This data collection uses primary and secondary methods. In this study, the author wants to analyze whether the Solo - Yogyakarta - NYA Kulon Progo toll road project has a negative impact on the process of implementing the Solo - Yogyakarta toll road construction project and provide input to related parties to deal with issues related to the EIA. Researchers analyzing the impact of Amdal refer to the Minister of Environment Regulation. From the results of the analysis there are several variables that are quite influential on the community environment such as noise, air pollution, road facilities and socio-economic indicating that the handling of EIA in toll road construction projects is less than optimal and less effective.

Keywords:- Amdal, Method, Impact.

I. INTRODUCTION

One form of government effort in facilitating the community to carry out social and economic mobility is to build toll roads. In addition to the large capital needed to build a toll road, land is also needed to construct the building or construction of the toll road. The construction of this toll road is predicted to be able to become a source of income for the state treasury and reduce congestion. The Solo-Yogyakarta Toll Road construction project is one of the toll road construction projects in the Java Island region.

Apart from the positive impacts, there are also negative impacts. Therefore, an Environmental Impact Analysis (EIA) study is urgently needed to address the significant impacts that may occur. The complexity of a project's activities affects the magnitude of the negative impacts that arise. The need for attention from actors in the construction sector on the negative impacts that arise when the construction project is carried out. Thus the benefits of the construction project can be expanded. During the construction period there were various kinds of negative impacts, such as chemical impacts, physical impacts, biological impacts, social impacts, cultural impacts and economic impacts. Moreover, there were many discrepancies and the lack of optimal implementation of the Amdal by the party responsible for the implementation of this project which caused dissatisfaction with the people affected by the negative impact of the process of implementing the Solo - Yogyakarta - NYIA Toll Road construction project.

This study aims to identify the impact and conduct an analysis related to the impact caused by the process of implementing the construction of the Solo-Yogyakarta-NYIA Toll Road. There are several journals that support this research, including:

- Identification and Efforts to Control Negative Impacts of the Implementation Phase of the Multi - storey Building Construction Project on the Surrounding Environment Case Study of the Blok M Square Project by Bob Dysans in 2018. This research was conducted to identify and control the most influential impacts of the implementation of multi-storey building construction projects and their consequences on the environment around. The method used was a case study and data obtained from questionnaires and interviews were processed using SPSS v.12 and AHP. From the AHP analysis and the Descriptive Test, the 5 biggest impacts were obtained, namely air pollution, road contamination, damage to road construction, disruption to the comfort of road users, facilities that quickly get dirty, damaged, and corroded.

- Analysis of the Impact of the Development of the Trans Sumatra Toll Road on the Change of Function of Residential Land and Community Rice Fields Reviewed in an Islamic Economic Perspective by M. Ramdani Nasrudin in 2019. The purpose of this study was to find out how much impact the construction of the Trans Sumatra toll road had on the conversion of residential land and community rice fields and knowing the condition of the community structure after the conversion

of community land functions is reviewed in the perspective of Islamic economics. This type of research is field research with data collection methods by observation, interviews, questionnaires and documentation. This study uses a descriptive analysis method with a qualitative approach.

II. RESEARCH METHODS

A. Location and Time of Research

The research was conducted in April 2022 – August 2022 at the Solo – Yogyakarta – NYIA Kulon Progo Toll Road Development Project Section 1 Package 1.1 which focuses on Zone 1, namely from STA 0+000 to 13+000.

B. Stages Of The Research Method

To achieve this goal, the research method used by the author is a case study, namely direct observation in the field using interview techniques along with questionnaires

to respondents who are around the construction project site. Case studies on projects are carried out because of the challenges in research with themes that are broad and valuable enough to be discussed and believe that every construction project is unique and will never be the same.

The flow of research that we carry out begins with identifying problems in the field to determine the topic and research objectives. Then a review of the Amdal, UKL - UPL documents, as well as literature studies. Furthermore, a review of environmental impacts was carried out directly in the field as well as distributing questionnaires and interviews with the community around the project. Data processing uses SPSS software for statistical analysis and Ms. Excel for descriptive analysis so that the results of the discussion, conclusions, and suggestions related to this research are obtained. The flow of research we conducted can be seen in Figure 1.
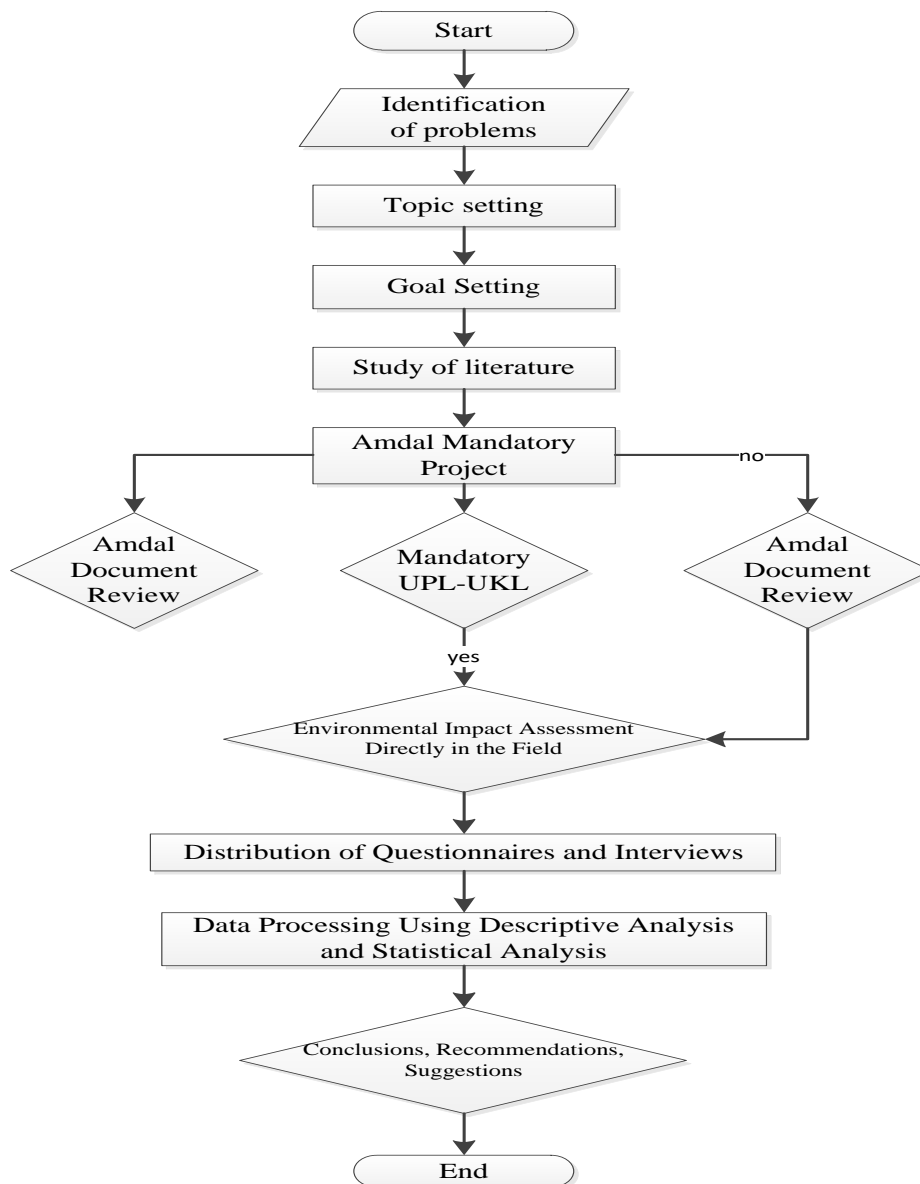

Fig. 1: Research Flow

C. Data source

In the process of this research the author collects data to facilitate the preparation of reports based on:

➢ *Primary data*

Primary data is data obtained directly from the source, observed and recorded by the first party. This data was obtained using two methods:

- Interviews, namely collecting by asking directly the respondents (communities around the project within a radius of less than 2 km) who are in the vicinity of the construction project site.
- Questionnaire / Questionnaire, a data collection technique that contains a list of questions with reference to the Likert scale.

➢ *Secondary data*

Secondary data is data obtained indirectly from the source, but through a second party. This data is obtained from:

- Library / Literature Studies, carried out by reading and understanding from various sources of literature such as journals, books, previous research, and others.
- Documents from Adhi Karya Tol Solo - Yogya, the documents in question are Amdal documents and RPL-RKL documents.

D. Population and Research Sample

According to M. Ramdani (2019) Population is a collection of all measurements of the object or individual being studied. The population is a generalization area consisting of: objects / subjects that have certain qualities and characteristics determined by the researcher to be studied and then drawn conclusions. In this case the population referred to is the community around the Solo-Yogya Toll Road Development Project.

The sample is part of the number and characteristics possessed by the population. The sample can be defined as a part that is withdrawn from the population, as a result the sample is always a smaller part of the population. The sample of this study is the community affected by the construction of the Solo - Yogya toll road along Zone A (sta 0+000 to 10+100). The samples taken in this study amounted to 45 people. The ideal properties in a sampling method are as follows:

- Produce a reliable picture of the entire population studied.
- Determine the precision of the research results which determine the standard deviation (standard deviation) of the estimates obtained.
- Simple, so easy to implement.
- Provide as much information as possible at the lowest possible cost.

Determining the size of the research sample is the most important part that must be done by every researcher who uses the survey method. The sample is a reflection or description of the population so that if the wrong sample is taken or the sample size does not meet the requirements, the estimate of population parameters is considered invalid so that it can have an impact on errors in describing and interpreting the description and characteristics of the population.

The Slovin formula is a formula used to find the minimum number of samples obtained from survey results with a limited population or what is known as a finite population survey. According to Sugiyono (2010) the Slovin formula is a formula used to obtain a sample size that is considered capable of describing the entire existing population.

$$n = \frac{N}{1 + N.e^2}$$

Information:

n = sample size

N = population size or the number of elements in the population

e = predetermined value of precision or significance level

$$n = \frac{323.522}{1 + 323.522 \cdot 0,01}$$

$$n = \frac{323.522}{3.236,22}$$

n = 99,969

rounded up to 100 Samples

The research results from Gay, LR and Diehl, PL (1992), with the research title "Research Methods for Business and Management" stated that the research sample size must be as large as - large. The assumptions conveyed by Gay and Diehl are based on the larger the sample taken, the more it represents the shape and character of the population and the more generalizable it is. However, the exact size of the sample to be drawn will depend on the type of research being carried out. Here are some conditions to watch out for:

- If the research being carried out is descriptive research, then the sample size is at least 10% of the total population elements.
- If the research being carried out is correlational or related research, then the sample size is at least 30 subjects (sample unit).
- If the research being carried out is comparative research, then the recommended research sample size is 30 subjects.
- If the research being carried out is an experimental group, then the recommended sample size is 15 samples per group.

In this study, researchers took a sample of 45. As a general rule, a sample size of between 30 and 500 can be effective depending on the sampling method used and the research questions used.

E. Research Instruments

The instrument is a tool used by the author in collecting data and in processing data. The research instrument that the authors use in collecting data is by interviewing directly with respondents along with distributing questionnaires. The respondents in question are the people around the Solo - Yogya Toll Road Development Project Section 1 along zone A. The interview technique used is guided free interviews while the questionnaire uses a Likert scale and each answer has the following values:

- No effect
- Little effect
- Moderately influential
- Influential
- Very influential

III. RESULTS AND DISCUSSION

According to Andri Billik (2014) Validity shows how far a test or set of operations measures what should be measured. Testing the validity of each questionnaire question using the Pearson product moment validity technique. The test is carried out by correlating the item scores with the total score, then interpreting the resulting correlation coefficient, if the correlation of each factor is positive and the magnitude is greater than or equal to the "r table" value, it can be concluded that the instrument has good validity.

This test uses a total of 45 respondents with a significance level of 5%, therefore the specified "r table" value is 0.294 based on the "r" value distribution table in the SPSS program.

The basis for taking the Pearson product moment validity test is by comparing the value of r count with r table, if the value of r count > r table then the questionnaire is said to be valid, while r count < r table then the questionnaire is said to be invalid. Then by looking at the significance value, if the significance value is <0.05 then the questionnaire is said to be valid, while the significance value is> 0.05 then the questionnaire is said to be invalid.

Recapitulation of the validity test on the questionnaire items using the Pearson product moment technique with the help of the SPSS software program obtained the results as shown in Table 1.

Table 1: Validity Test Recapitulation

Item Number	r Count	r table 5% (45)	Sig	Criteria
A.1	0,765	0,294	0,00	Valid
A.2	0,883	0,294	0,00	Valid
A.3	0,816	0,294	0,00	Valid
A.4	0,759	0,294	0,00	Valid
B.1	0,941	0,294	0,00	Valid
B.2	0,927	0,294	0,00	Valid
B.3	0,936	0,294	0,00	Valid
C.1	0,903	0,294	0,00	Valid
C.2	0,914	0,294	0,00	Valid
C.3	0,871	0,294	0,00	Valid
C.4	0,880	0,294	0,00	Valid
D.1	0,901	0,294	0,00	Valid
D.2	0,875	0,294	0,00	Valid
D.3	0,911	0,294	0,00	Valid
D.4	0,817	0,294	0,00	Valid
D.5	0,729	0,294	0,00	Valid
E.1	0,909	0,294	0,00	Valid
E.2	0,857	0,294	0,00	Valid
E.3	0,725	0,294	0,00	Valid
F.1	0,935	0,294	0,00	Valid
F.2	0,940	0,294	0,00	Valid
F.3	0,934	0,294	0,00	Valid
F.4	0,843	0,294	0,00	Valid
F.5	0,932	0,294	0,00	Valid
G.1	0,688	0,294	0,00	Valid
G.2	0,892	0,294	0,00	Valid

Item Number	r Count	r table 5% (45)	Sig	Criteria
G.3	0,808	0,294	0,00	Valid
G.4	0,745	0,294	0,00	Valid
H.1	0,969	0,294	0,00	Valid
H.2	0,975	0,294	0,00	Valid
H.3	0,951	0,294	0,00	Valid

From the results of the research questionnaire instrument test, it was concluded that 31 measurement items for all variables were declared valid, because the r count value was greater than r table and the significance value was less than 0.05 with a total of 45 respondent data.

After testing the validity, then testing the reliability. This reliability test uses an alpha scale technique to determine consistency between questionnaire items. Reliability testing is carried out because it is related to the existence of a problem of trust in the test instrument. According to Andri Billik (2014) Reliability is an index that shows the extent to which a measuring instrument can be trusted or relied on. If a measuring instrument is used twice to measure the same symptoms and the measurement results are relatively coefficient, then the measuring device is reliable.

The basic concept of reliability testing using the Cronbach alpha technique was carried out after the questionnaire items were declared valid based on the validity test. The reliability test aims to see whether the questionnaire has consistency if measurements are carried out with the questionnaire repeatedly, so that a research questionnaire can be said to be of high quality. The basis for taking the reliability test is by comparing the Cronbach alpha value. According to Wiratna Sujerweni (2014), the questionnaire is said to be reliable if the Cronbach alpha value is > 0.6.

Recapitulation of the reliability test on the questionnaire items using the Cronbach alpha technique with the help of the SPSS software program obtained the results as shown in Table 2.

Table 2: Recapitulation of the Reliability Test

Item Number	Cronbach's Alpha	r min (0,6)	Criteria
A.1	0,805	0,6	Reliable
A.2	0,719	0,6	Reliable
A.3	0,768	0,6	Reliable
A.4	0,797	0,6	Reliable
B.1	0,874	0,6	Reliable
B.2	0,898	0,6	Reliable
B.3	0,905	0,6	Reliable
C.1	0,877	0,6	Reliable
C.2	0,872	0,6	Reliable
C.3	0,895	0,6	Reliable
C.4	0,901	0,6	Reliable
D.1	0,863	0,6	Reliable
D.2	0,871	0,6	Reliable
D.3	0,860	0,6	Reliable
D.4	0,891	0,6	Reliable
D.5	0,912	0,6	Reliable
E.1	0,695	0,6	Reliable
E.2	0,736	0,6	Reliable
E.3	0,800	0,6	Reliable
F.1	0,936	0,6	Reliable
F.2	0,935	0,6	Reliable
F.3	0,936	0,6	Reliable
F.4	0,956	0,6	Reliable
F.5	0,937	0,6	Reliable
G.1	0,758	0,6	Reliable

Item Number	*Cronbach's Alpha*	r min (0,6)	Criteria
G.2	0,607	0,6	Reliable
G.3	0,784	0,6	Reliable
G.4	0,725	0,6	Reliable
H.1	0,939	0,6	Reliable
H.2	0,930	0,6	Reliable
H.3	0,964	0,6	Reliable

From the results of the research questionnaire reliability test using the cronbach alpha technique, it was concluded that 31 measurement items on all variables were declared reliable, because the Cronbach alpha value was > 0.6 with a total of 45 respondent data.

Descriptive analysis has the aim of obtaining the average value (mean), percentage, frequency, and tabulation of data from the overall results of the questionnaire / questionnaire given to respondents regarding the variables asked. This analysis is used to get a quantitative picture of the negative impact on the environment in the Solo-Yogya Toll Road development project.

The rating category on the respondent's answer is used to explain the results of the respondent's chosen answer to the questionnaire statement. According to Sugiono (2013) the determination of categories on the Likert scale is by determining the value of the interval level.

$$\text{Interval Level Value} = \frac{\text{Highest Index} - \text{Lowest Index}}{\text{Highest Index}}$$

- Minimum Index : 1
- Maximum Index : 5
- Interval : 5–1 = 4
- distance intervals : (5-1)/5 = 0,8

The scale categories according to Sugiyono (2013) can be seen in Table 3. as follows:

Table 3: Scale Category

Scale		Category
1,00	1,80	Very influential
1,81	2,60	Influential
2,61	3,40	Influential enough
3,41	4,20	Very influential
4,21	5,00	No effect

Based on the results of the descriptive test, it was stated that the variables of noise, air pollution, road facilities, and socio-economics had a significant negative impact. Then the variables of water pollution, soil pollution, vibration, and socio-culture have no impact on the implementation process of this project.

The variables of noise, air pollution, road facilities and social economy have quite influential results, which means that the handling of environmental impacts in toll road development projects is less than optimal and less effective for the communities around the project.

IV. CONCLUSION

Based on the results of data analysis of community respondents around the Solo - Yogyakarta-NYIA Toll Road Development project which focuses on STA 0+000 - 10+200 regarding environmental impacts due to development activities, the conclusions are as follows:
- From the results of the validity test and reliability test, all question items on all variables were stated to be valid and reliable so that the questionnaire was appropriate to be used as an instrument of this research.
- The variables of vibration, water pollution, soil pollution and socio-culture have no effect, which means that the handling of environmental impacts in toll road construction projects is optimal and effective for the community around the project.
- The variables of noise, air pollution, road facilities and social economy have quite influential results, which means that the handling of environmental impacts in toll road development projects is less than optimal and less effective for the community around the project.

SUGGESTION

Based on the conclusions obtained in this study, the authors make suggestions for further research to improve the research that has been done, for example:
- Controlling the negative impacts of construction projects at the planning and post-construction stages.
- Future research is suggested to add other variables that might affect the research results.

THANK-YOU NOTE

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