

ECOLOGICAL INPUT ASSESSMENT FOR PROJECT DESCRIPTION ASPECTS: A STUDY ON EIA REPORT FOR QUARRY ACTIVITIES IN MALACCA

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ABSTRACT

EIA is a procedure that has been implemented to ensure compliance with a development project. The evaluation of ecological input is a method of measurement used to ascertain compliance and the adequacy of the ecological inputs provided. This study focus as on the aspects of project description. The method used is according to the revised package of measurement for 12 ecological input criteria in the EIA report. The study shows that there was non-compliance in the preparation of the EIA report for the project description. The information provided is general, vague and indistinct. There is also information such as maps and geological structure but scope is not stated in detail and even some not included. These weaknesses affect to the effectiveness and accuracy of the facts and information provided in the EIA report. The environmental impact, especially on the ecological system would be affected, when a development project is implemented. Proposals in the preparation of the EIA report of the project description for the ecology such as SEA input could be implemented. This SEA application will be able to strengthen the EIA report prepared. It indirectly enables the maintenance and preservation of the environment in any development projects.

Keywords: project description, EIA, quarry activity, ecological input assessment, compliance

Introduction

EIA is a measurement tool used for environmental strategy in 19 activities listed in Malaysia including quarrying activities. The purpose of EIA report is to integrate the environmental dimension in the planning and implementation of development activities. This report will ensure that the expected effects on the environment may occur as a result of the activities planned and will be carried out later can be handled immediately. Preparation of EIA report is a directive that must be followed because the law makes it a requirement under section 34A of the Environmental Quality Act 1974.

Evaluation of ecological input is one of the important aspects in environmental impact assessments to ensure the conservation of biological diversity is maintained. Description of project is one aspect in the evaluation of the ecological input is also one of the important criteria to ensure balance and environmental sustainability and economic development. Through the project description to any form of land use and ecological as well as geographical boundaries identified before a development project is implemented. Lack and neglect in providing EIA report without a description of the project will affect the location and progress. For this paper, researchers will discuss compliance in the preparation of the EIA report of the project description and the adequacy of the information necessary for the ecological input. In addition matters related to the guidelines and other weaknesses identified during the review of the EIA report were also discussed. Ecological input is an important element that should be considered in the preparation of the EIA report.

Literature Studies

EIA Requirements

According to Section 34A of the Environmental Quality Act 1974 and the Environmental Quality Order (Prescribed Activities) (Environmental Impact Assessment) 1987, a development project in the category of prescribed activities required to prepare the EIA report. This report is provided prior to submission to the Director General of the Department of Environment for consideration to get approval before any project is carried out (Department of Environment, 2000).

Section 34A also requires the EIA report submitted in accordance with the EIA guidelines from Department of Environment. A Handbook of Environmental Impact Assessment Guidelines issued by the Department of Environment is a general guideline of environmental impact assessment for all development activities. These guidelines are then issued for the second issue (1995) and third (2000) (Department of Environment, 2015). Since 1992, more specific guidelines for prescribed activities have been provided by the Department of Environment to strengthen the effectiveness of the EIA procedure. For example, guidelines for quarrying activities, there are additional guidelines namely the Environmental Impact Assessment Guidelines for Mines and Quarries. The format of the preparation EIA report should be in accordance with the guidelines and assessment must ensure that all necessary information is included in the guidelines provided in the EIA report.

Apart from that, filling the form is necessary for public involvement in the initial assessment even though it is not required. However, in a detailed report of public involvement is mandatory. Public involvement in assessment processes during the

formation of TOR (Terms of Reference) for detailed evaluation. TOR is a summary list of the significant impact on the environment and no significant impact has been assessed during detailed evaluation (Department of Environment, 2015).

In the early stages of EIA introduction, most of EIA consultants are allowed to appoint the project proposer to prepare the EIA report. However, since 1994 to improve the quality of the EIA report, only EIA consultants are registered with the authorized Department of Environment to conduct an environmental impact assessment (Department of Environment 1996). Since the registration scheme was introduced in 1991-2003, a total of 313 individual consultants and 80 consultancy firms had been approved for registration by the Department of Environment (Department of Environment, 2004).

Requirement Aspects of Ecology in EIA

The emphasis on ecological input in EIA, is not clear until the introduction of the National Policy on Biological Diversity (National Policy on Biological Diversity) in 1998 (MOSTE, 1998). One of the strategic policies is to improve the sustainable use of biological diversity in the EIA report for development projects. Previously, the emphasis on biodiversity is not linked directly to the EIA. Although this EIA idea comes from the Third Malaysia Plan (1976-1980), but was developed with the main objective to assist environmental planning of the new projects or for the expansion of projects that have been carried out.

There are three main categories in the EIA report namely physico-chemical, biological and social environment. Biological components include animal and plant, the distribution and the presence of various species and community habitats (Table 1). To describe in detail the biological component, the EIA guideline book also emphasize the importance of taking into account the level of habitat species as the level of habitat and its community.

Bird life is one of the aspects emphasized here, as well as the community life of rock and wildlife area. The guidelines state that the maintenance of geology border, wildlife and plants between the project and the sensitive ecological area nearby is also important. In addition, it is also stressed that attention should be given to the production of new habitat caused by the construction and expansion of the original community (Department of Environment, 1995).

Table 1: Components of biological highlighted in the EIA guidelines

| Important Aspect | Detail |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Species and population | <ul style="list-style-type: none"> • terrestrial plants • terrestrial wildlife • other terrestrial fauna • wildlife rock/aquatic • other wildlife rock/aquatic |
| Habitat and communities | <ul style="list-style-type: none"> • terrestrial habitat • mainland community • aquatic/rock habitat/estuary • aquatic community • rock life community/estuary |

Source: Department of Environment in 1995

Methodology

Department of Environment (DOE) guidelines as well as information from external researchers have completed Ecology Input Revision Package was developed in assessing the ecological input for preparation of the EIA report for the operation of the quarry project. The same revision package can also be used to evaluate the EIA report which was developed for other scheduled activities to determine modifications.

In this revision package, a total of 12 criteria used to assess the ecological input in the EIA report (Table 2). General and additional guidelines for quarry projects are seen in the process of putting together in this package. Some questions of ecological consideration or proposals from other researchers used by researchers, if any certificate is not found in the DOE guidelines. But for this paper, we only focus on the explanation project in the revised EIA report.

Table 2: 12 Criteria review and the appropriate category

| No. | Review |
|-----|-----------------------------------------------------|
| 1 | Description of project development |
| 2 | Description of existing biological development |
| 3 | Forecasting ecological impact |
| 4 | Significant impact assessment |
| 5 | Measurement of insulation and reduction steps |
| 6 | Residual Impact |
| 7 | Monitoring and auditing Commitment to monitoring |
| 8 | Checklist |

| | |
|----|----------------------|
| 9 | Communication report |
| 10 | Summary |
| 11 | Reference |
| 12 | Negotiator |

From this package, the EIA report is reviewed to determine the sufficiency of the information on ecological and see the extent of compliance with the implementation of the project against what is stipulated by the relevant authorities of project description. Given the information available 'YES' and 'NO' to that information is not included. The answers obtained from the measurement, determination of adequacy is made by measuring the scoring for the answer 'YES' (Table 3). Results were recorded and analyzed revisions made to get the number of reports or the percentage of reports that are categorized based on adequacy mark for overall revised report.

Table 3: Overall assessment score

| Score | Scoring evaluation |
|-------|----------------------------------------------------------------------------------|
| 1 | Relevant information is well documented, no important tasks left incomplete |
| 2 | Generally satisfactory and complete a part incomplete |
| 3 | Can be considered quite satisfactory or incomplete |
| 4 | This part is quite good but overall not satisfactory because too many incomplete |
| 5 | Not satisfactory, significant incompleteness |
| 6 | Very unsatisfactory, important tasks are not made well or not made direct |

Revision to any reports are carried out in three replications with a distance of at least two months for each part to minimize any predisposition, therefore revisions will be as objective as possible. After three repetitions of this, if there is any difference in the results obtained, the EIA report in question will be reviewed to eliminate any inequalities.

Results and Discussion

Ecological impact assessment is important to the environmental impact assessment process and has an important role to play in ensuring the preservation of biological diversity is in line with development (Treweek, 1999). To ensure a balance between environmental preservation and economic development, the project description should be given critical attention. Aspects of the project description can give valuable information about the proposed development because it is very necessary to make reliable predictions about the ecological input. It also complies with the guidelines and additional guidelines of the Department of Environment namely Environmental Impact Assessment: Guidelines for Mines and Quarries (Department of Environment, 2000). According to the Department of Environment guideline book on project description includes technical data, maps, diagrams and summaries of technical characteristics. In addition, economic and environmental aspects are also important in the project description as this information will help in forecasting the ecological input. Project description will also clarify the determination of plant and animal species, especially the protected species and should be maintained even if the development process will be carried out (Jain et al., 2001)

Review of this project description is based on two preliminary EIA for the quarry activities in Melaka (Appendix 1) were studied. This is one of the 19 scheduled activities identified by the DOE projects that require an EIA before any development executed. For this activity, the proposed quarry for aggregate, limestone, silica, quartzite, sandstone, marble and stone ornaments building within three kilometers of area residents, commerce or industry or any area approved licenses for residents, commerce and industry are required for EIA execution. This study attempts to outline the issues that may be connected to existing guidelines and also weaknesses found in the EIA report. Description of project will determine the significance and focus on determining the impact on resources, ecosystems and communities. The project site is also a natural border with the surrounding area. The result of this assessment will provide a roadmap for future reference regarding the ecological impact. The validity of information can be accepted on the description of the project will produce a proposal that is very important so that the ecological implications are handled (Treweek 1999).

From this review, although the project activities are well described but developers still give less emphasis to include a summary of the characteristic, technical, economic and environmental development project. Similarly, the description of the surrounding area of the site provides a less overview of the condition of the project site. Department of Environment guidebook also does not explain these requirements, it failed to state the essential information needed. The summary should be included because the early scope of activities will determine the environmental issues that is closely linked with the development of the project (Department of Environment, 1995). Criteria for review concerning description of the proposed project are summarized in Table 4. From the initial assessment of the revised EIA, two of this report gives a detailed description of the project activities that are less clear and as well as the justification for the project selection.

Table 4: Summary of the review category for a description of the proposed development projects

| No. | Aspects to be considered | |
|-----|------------------------------------------------------------------|---|
| 1 | Does it state the total project area? | 2 |
| 2 | Does it explain the vast amount of land that is being developed? | 1 |
| 3 | Does it indicate clearly the project site on the map? | 1 |
| 4 | Does it explain the current land use to be developed? | 0 |

| | | |
|----|--------------------------------------------------------------------------|---|
| 5 | Does it state any geographical boundaries and ecology? | 1 |
| 6 | Does it explain the operation of the project activities? | 2 |
| 7 | Does it include a schedule for the implementation of the project? | 2 |
| 8 | Does the selection project is done in fair manner? | 0 |
| 9 | Does the report include the option not to carry out the project? | 0 |
| 10 | Is there any attempt to identify key issues relating to the development? | 1 |

However, this report mentions the total development area. The project site is also explained along with maps, photos and illustrations. In addition, the report includes the schedule of project development implementation in the report discussion. The report shows clearly that the revised project site on the map. Only one report mentions about the boundaries of geography and project site ecology. The early study also found beforehand that this aspect is not adequate in the initial assessment report which was reviewed by EIA for the quarry activities and they suspect this is due to the weakness of the Department of Environment guidebook which is not specific to what is required in describing the proposed project.

Both of the EIA reports have been reviewed show compliance with aspects of project development explanation. This conformity is from the aspect of the project activities and project selection. However, the EIA report reviewed still less emphasis in explaining the operation table and land under development. What should be proposed for each phase of project development is important information for effective ecological impact assessment. Project description is also necessary to identify some groups of wildlife such as birds and wildlife threatened by quarrying project activities such as seasonal patterns in the distribution of the species that need to be considered (Treweek, 1999). What else in the operation of quarries that provide critical impact on air pollution, especially in times of drought and its impact on the proposed site and surrounding wildlife. This was the description in the report, namely:

- a. *"dust dispersion occurs as a result of the vehicles movement on unpaved roads during dry weather"*
- b. *"dust dispersion occurs as a result of fragmentation and rock filtration, hole drilling and blasting work"*

This situation needs to be clarified in the report so that any implications of ecological activities on ecological systems can be identified. For example "though air and noise pollution occur it is expected to be reduced by the gradual control". This indicates contamination remains and it does not specify those controls. The statement given is also vague.

Ecological aspects must be understood as every environment has unique and dynamic ecosystem. Thus the total area of the project, the proposed sites and activities of different projects can have different effects on species and habitats within the project area or its surroundings. The review of the initial evaluation report EIA said the whole area involved in the project development. Neglect of this aspect can cause a lot of environmental impacts. For example there are omissions in the review of the proposed EIA for road construction projects in the UK. They found that only 3% of the revised report stated the width and length of the proposal. According Treweek et al. (1993) if the dimensions of the proposed road scheme are not known it is impossible to determine the ecological receptors that may be affected. That aspect of the project description in the evaluation of the ecological inputs for the EIA report is very important.

In addition to the review report also found a lack of information regarding the geological environment area to be quarried and ecological aspects to be considered, particularly the geological structure and layout of the environment affected areas. Information provided is for general information only. This condition affects the identification of impact issues and life there. Example of the statement:

- a. *... 'the presence of the granite has been inferred from the abundant granite boulders within the proposed project site. The boulders range from less than 1 meter to about 8 meters in size. The granite rock occupies a large hilly and undulating areas especially around the project site. 'The report said the geological structure of the rock in general and not specifically ecological statement. While the area is a hilly area, rich in flora and fauna and is drained by several streams such as Simpang Ampat River, Pereling River and Tampin River... '.*

The report also commented vaguely on the boundaries of geography and ecology related to the project site. Determination and identification of borders are the key issues that are usually conducted during scoping. The lack of this information shows that scoping is not carried out properly. Scoping is important in explaining the various environmental factors prior to the implementation of the project (Biggs et al., 1995; Therivel & Morris, 1995). Studies elsewhere have also shown that there are significant weaknesses in the scoping (Elkin & Smith, 1988; Treweek, 1999). Beanlands and Duinker (1984) assert that EIA should be able to identify a set of initial startup, valued ecosystem components to provide a focus for such activities. They also add the context of space and time for the EIA study of valued ecosystem components must be clearly indicated. In fact, additional guidelines for quarrying activities also emphasized that the scoping must be documented thoroughly in the EIA report as well as introducing the scoping approach.

For the preparation of the EIA report in a few countries such as Taiwan, Bangladesh and Ghana, using the nearly same EIA procedure as in development projects to examine the environmental aspects, including the scope of the criteria is essential for completing the report (Leu et al., 1996; Appiah-Opoku, 2001; Momtaz, 2002). Apart from providing scope for baseline study unit identification of sensitive landscape, scoping also assists in determining the carrying capacity of the operation of quarrying activities (Department of Environment, 1994). As stated by Treweek (1999) the importance of scoping cannot be underestimated. If the scoping ignored, important ecological component information, may be left in EIA or known too late to do anything about it.

For a description of the project activities development components such as housing units, infrastructure and support were included in the review. From the report reviewed, there seems existing housing units, infrastructure and support facilities. This facility is important in determining the impact arising and proposed mitigation step.

Guidelines and Information Project

Guidelines have established that the EIA report should include a description of development projects. The description should also contain technical data, map, picture and diagram. Summary of technical, economic and environmental conditions of the project area should also be available in this section (Department of Environment, 2000). From the results of the review report failed to correlate with the geographical conditions of the proposed development. In addition there is also a lack of clarity in explaining the impact of quarrying activities and limited lighting in the ecological aspect also makes it difficult to determine the potential impact of a possible future.

Although most of the revised EIA reports have descriptions of development projects, but the effective use of graphical presentation is very limited. The technique is necessary to show the diversity of development activities on the ecological distribution map that gives a visual guide to identify areas at risk from the specific impacts and this is important in the preparation of the report.

In the discussion on baseline data, two areas highlighted by additional guidelines are study area and surrounding areas that are important for the environment and development, and provide the same information as described above. However no report that state the border of the neighborhood area. While almost a part of the study area is to be covered. Border of surrounding area is important because it involves the project boundary, management, ecology and technique. Borders also involves the geology, bio-physical, land use, biological resources, social indicators and the aesthetic, to be considered and mapped according to the importance and sensitivity. In the two cases, additional guidelines are clear in the objectives and use. But the reviewed report still not making any progress and there is no attempt to carry it out. The question is why? EIA report before 1995 is exempted from this shortage, but additional guidelines in use since 1995 and the report is between 1995-2002. But there is no attempt to use these guidelines. Failure to prepare a report based on the guidelines because there is no expertise in the required fields and quarrying activity is an activity that is quite complicated for developers to prepare the EIA report and important aspects are ignored. Enforcement authorities also may not clearly convey the information in the guidelines, what to be met by the developer.

A good guideline as additional guidelines, preferably requiring EIA consultants to define the types of activities that may cause ecological impact, size and location of the effect and duration of projects, and most of the reports reviewed the shortcomings found in this aspect. Information like this will make the impact determination and the importance of their work is complete (Morris, 1995).

Recommendations and Conclusions

Original reactive and limitation on sustainable development have caused EIA more prone to be ineffective in environmental management in the country. Lack of an ecological input shows that the EIA regulations are limited in protecting the environment. Although this weakness can be caused by various factors, such as lack of experience of EIA consultants on ecological input, vagueness in the EIA guidelines and so on. However, in order to improve the effectiveness of the EIA are not enough to express the relation of cumulative impact, impact directly and indirectly and wholly sustainable development. This is due to the fact that EIA is based on the description of the project, with the scope of the environmental assessment is limited. Weaknesses in EIA should not be continued and provoked when issues related to the environment caused by quarrying activities posed by certain parties.

Through the introduction of the SEA (Strategic Environmental Impact Assessment) it can be implemented with EIA to further strengthen the preparation of EIA report for the project description. The introduction of SEA is an additional in overcoming the limitation of EIA. SEA approach is involving policy, planning and environmental assessment plan. SEA examined the impact on the environment of the development projects. While the focus on the impact of development to the environment is the task of the EIA.

SEA does not intend to acquire EIA but SEA involves every level of the decision-making process. At this stage, PPP for the environment is encapsulated in a proactive way of using SEA. The PPP will then form the framework for specific development goals and projects that can be evaluated using EIA. SEA is widely used in some countries with specific experience that shows many proposed SEA, which is more easily implemented at the project level (Therivel & Partidario, 1996).

For the SEA to be carried out, it must find a way on the political agenda and the application in a long time. No one understands very well the weakness and inadequacy in EIA based on the project from the people involved in the relevant regulations. Therefore the Department of Environment has made a commitment to promote the use of SEA in the environmental management system in Malaysia. Although SEA is not a mandate in Malaysia, environmental studies became part of the research sector in the structure plan. Among the activities of the quarry which is viewed from the level of PPP in SEA. This can be the basis for SEA development in the future.

SEA is not a procedure that can be replicated or taken by others. Problems, needs and priorities emphasized by the user affirmed the SEA process. This compatibility allows the SEA to be determined for the difficult planning, policy making and decision making processes. Moreover, the strengthening of the environmental management system is an instrument of measuring the EIA as SEA.

In addition, existing guidelines and the additional proposal of SEA in the EIA, the review package that is used to identify the remain of information ecology, besides the compliance of the developers to the guidelines, can be implemented to serve as guidance in the preparation of the EIA report, especially for the description of the project for input ecology. This review package is combined results from the research of outside researchers, existing guidelines and the researcher's own research, in accordance with the problems of ecological environment in Malaysia especially in quarrying activities.

Attachment 1

| No. | Title of EIA Report | Date | Proposer | Consultant |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-----------------------------|-----------------------------------------------|
| 1 | EIA for existing granite quarry at lots 737, 1078, 1079, 1369, 1370, 914, 1010, 1009, 1012, 1011, 1008, 543 and 653, Bukit Panchor Mukim Melaka Pindah, Daerah Alor Gajah, Melaka | Jun 1997 | KOH AH SDN. BHD | Shoh Consultancy |
| 2 | Environmental Impact assessment for the proposed Alor Gajah Quarry, Mukim Tabuh Naning, Daerah Alor Gajah, Melaka | Disember 1997 | ICM TENGGERA KUARI SDN. BHD | Biro Rundingan Universiti Kebangsaan Malaysia |

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