

# The Role of Environmental Impact Assessment in Addressing Marine Environmental Issues Arising from Oil and Gas Activities: Examples from Malaysia

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**Abstract.** Malaysia being a maritime nation is well endowed with valuable resources found within her marine waters, notably that of oil and gas. These conventional sources of energy, which are being actively exploited, contribute significantly to the nation's economic growth and industrialization. However, in the context of marine protection, oil and gas activities have the potential for a variety of adverse environmental impacts. As a developing country, the challenge here is how to balance the conflicting needs for economic development and environmental protection. Resolving this issue means finding a strategy that can take into consideration the importance of both needs. For this reason, Malaysia adopts a strategy known as the environmental impact assessment (EIA) enforced as a mandatory legislative requirement on selected activities including that of oil and gas. This paper seeks to explore the role of EIA in addressing the marine impacts from oil and gas activities. This paper argues a strong case for the application of EIA in a developing country like Malaysia as a preventive approach against environmental impact with the aim of striking a balance between development and the conservation of the environment.

**Keywords:** marine environmental issues, oil and gas activities, environmental impact assessment, environmental law.

## 1. Introduction

Malaysia is a maritime nation having one of the largest continental shelf and a distance of 200 nautical miles of the exclusive economic zone. The many seas surrounding Malaysia are important to the country as they are rich in various resources including the most economically valuable; oil and gas. These resources have fuelled the country's economic growth and contribute approximately 20 percent of the national GDP. By 2020, Malaysia aims to have a more diversified oil, gas and energy sector that remains vital to the country's development, and that builds on the nation's competitive advantages.

However, from an ecological perspective, there is a persistent concern over the adverse impacts of oil and gas activities on the marine environment which can occur at the various phases of their production projects. For the upstream activities, referring to activities in the oil and gas industries from continental shelf and deepwater, their environmental concerns are varied. They include habitat protection and biodiversity, pollution discharge, incidents of oil spills, and water contamination. However, for these activities, their actual adverse environmental implication may depend upon the stage of the process, the size and complexity of the project, and the nature and sensitivity of the surrounding environment.

With the growing concern of environmental deterioration due to the fast economic development, Malaysia had taken steps to develop and implement EIA within her environmental and planning strategies. For Malaysia, the role of the government in setting and enforcing the EIA regulations is considered a key towards minimizing the potential environmental impact, and attaining sustainable development through the balance between economic development and sustainable utilization of natural resources. Such balance can be

achieved through EIA by ways of identifying and assessing activities known to have significant impacts on the environment. With the proper application of EIA, apart from other best environmental practice, various potential impacts can be eliminated or mitigated. This paper provides an overview of EIA as a legal approach to achieving high environmental protection in the activities necessary for offshore oil and gas projects in Malaysia.

## **2. Environmental Impact Assessment**

In general, the environmental impact assessment (EIA) is applied worldwide as the procedure and management techniques which ensure that the likely effects of any new development on the environment are fully appraised before the development is allowed to proceed. Historically, EIA was first introduced by the United States in 1969 as a domestic law through the National Environmental Policy Act. Over the years many other countries follow suit by incorporating EIA into their legal regimes, including that of Malaysia. For Malaysia, EIA is made a mandatory self-assessment exercise and considered preventive and precautionary mechanisms against potential environmental degradation. It is envisaged that, by making EIA compulsory under the law, potential damage to the environment can be minimized or prevented at the initial stage of the project itself. It also helps ensure that active and direct participation of stakeholders in the EIA process can be achieved.

Specifically the legal requirement of EIA is provided under section 34A of the Environmental Quality Act 1974. This section gives authorization to the relevant government minister to prescribe any activity which may have significant environmental impacts as a prescribed activity. Section 34A further requires the project proponent of a prescribed activity to submit an EIA report to the Department of Environment for approval. The Department of Environment is a government agency under the Ministry of Natural Resources and Environment Malaysia. One of the Department's main functions is to enforce all provisions under the Environmental Quality Act 1974, including that of EIA. The EIA report submitted by the project proponent must be in accordance with the guidelines issued by the Department. It must also contain an assessment of the impact of the prescribed activity on the environment, and detail out the proposed measures that shall be instituted to prevent, reduce or control adverse environmental impacts.

Activities subject to EIA are prescribed under the Environmental Quality (Prescribed Activities)(Environmental Impact Assessment) Order 1987. In relation to oil and gas projects, related prescribed activities identified under this Order include: oil and gas fields development; construction of off-shore and on-shore pipelines in excess of 50 kilometres in length; construction of oil and gas separation, processing, handling and storage facilities; construction of oil refineries; and construction of product depots for the storage of petrol, gas or diesel (excluding service stations) which are located within 3 kilometres of any commercial, industrial or residential areas and which have a combined storage capacity of 60,000 barrels or more. For each of these prescribed activities, the project proponent must go through various processes which are part of the EIA requirements as preventive measures against potential environmental issues associated with the oil and gas activities. Malaysia follows the internationally accepted key processes of EIA including screening, scoping, assessing, and implementing project proponent's engagement. These processes and their role in mitigating the impact of the proposed projects on the marine environment are discussed below.

## **3. Environmental Impact Assessment Processes**

Section 34A requires that the EIA for oil and gas activities should be carried out early in the project cycle. Reason being that EIA can be used to assist in project planning where environmental considerations are incorporated at the earliest level of project planning. It is then carried out through development and project implementation, and continues throughout the operation of the project. There are several steps involved in this EIA process, including: site selection to determine the suitability of the site; project scoping to determine the pertinent environmental issues and the scope of the EIA study; the preliminary EIA and submission of its report; EIA review and approval; activities during project implementation for compliance with the EIA; and EIA approval conditions.

Arguably, there are various opportunities to mitigate and prevent environmental impacts derived from each of these processes. One of the foremost steps within the processes pertinent in environmental protection is that of site selection. For oil and gas projects, their site should be selected based on economic and technical feasibility and risk considerations. The EIA for projects located near to environmentally sensitive areas must be more comprehensive in reflecting other environmental issues of importance. Thus any proposed site located close to a marine resource should also be assessed for habitat and ecological importance.

The next step is scoping which sets the boundaries of the EIA, and defines the significant issues which need to be addressed in the EIA. This step is important as it also allows for mitigating the impacts of oil and gas activities on the marine environment. Specifically, scoping defines at the earliest level the linkages between site selection, baseline data and project description with the impact assessment components of potential impacts, residual impacts and mitigation. Among the necessary elements of scoping are site selection; project phases; and public involvement. For the purpose of site selection in relation to offshore projects, the project proponent must conform to the Department of Environment's guidelines for siting zoning, and must give great importance to environmental sensitivities. Subsequently, project phases requires the project proponent to predict the environmental impact during all phases of the project, namely from design to abandonment.

Scoping is a multi-disciplinary task, thus public participation is a necessity. Public participation here refers to seeking input from the various stakeholders including the affected local community. EIA in Malaysia acknowledges the importance of public involvement within its process and provides two options for such involvement, namely public information and public participation. The former is generally a one way communication from the project initiator to the public, whereas the latter is a two way communication from the project initiator to the public with feedback from the public. Participation process within EIA in Malaysia is done in two stages: first during the preparation of EIA study through methods such as surveys and meetings and, second, by written comment procedures after the EIA report was made available for viewing. Under section 34A, public participation process is made compulsory in the detailed assessment. For this purpose, notifications inviting the public to review and give comment on the detailed EIA report are issued by the Department of Environment and can be viewed from its website. These notifications contain the full name and address of the project proponent and the list of venues where the report can be referred to. The public may review the report on dates specified in the notification, and forward their written comments to the Department of Environment.

For the project proponent, when preparing the EIA report, they must ensure that each classified activity described is organised into various areas such as baseline information; key issues; prediction and evaluation of impacts; mitigation and abatement measures; and environmental management planning. Thus, for activities involving offshore oil and gas fields development, it is necessary for the project proponent to gather reliable baseline information for the overall project to be included within the preliminary EIA. Two types of database information are required here; one of which is project information pertaining to the fabrication, construction, installation, drilling and operational phases. Another is environmental information pertaining to existing environment in the project area covering physical, chemical and biological characteristics.

Another step that the project proponent must undertake in order to prepare the EIA report is to conduct a field survey of marine biodiversity including fisheries population and habitat quality for each land form unit. For this purpose, the project proponent must introduce within the project description or site selection issues related to the potential and residual impacts. For example, the key issues of concern in an offshore field development would include gaseous emissions; produced water and drilling discharges; accidental spills and leaks; waste management; and hazardous material handling. These identified issues would be assessed and classified to generate a list of potential impacts for each zone of development before the said impacts can be predicted and evaluated. Specifically, their prediction is founded by commonly used methodologies and models, whereas their evaluation is where the predicted impacts are judged on their significance. The judgment of such significant would depend on environmental factor being evaluated, and can be based on several criteria including laws, regulations, or acceptable national or international standards. For example, in

the case of offshore activities, evaluation of impacts on marine quality and ecosystem would be in accordance with acceptable international standards such as that of the United States Environmental Protection Agency, or the listing of unique and endangered species of the Convention of International Trade in Endangered Species of Wildlife Fauna and Flora (CITES).

Within the EIA report, it is necessary to include mitigating measures which are considered vital components to determine possible preventive, remedial or compensatory actions for each of the adverse impacts evaluated as significant. For offshore oil and gas field development activities, their mitigation measures would be considered, among other things, in relation to marine environmental protection, and include the introduction of the followings: pollution controls; waste minimization; waste management; phase implementation; awareness programmes; and safety, health and environmental programmes. As part of the EIA procedure and legal requirement, the execution of these EIA recommendations, and the Department of Environment's approval conditions would be included within the project proponent's execution plan. Thus, when EIA reports have been approved by the Department of Environment, the project proponents and the other relevant authorities must take action to ensure that the recommended mitigation measures are incorporated into the final project plan and are implemented. There are several methods that can be applied by the project proponent to implement mitigation measure's recommendations. They include Environmental Management Plan (EMP) and Emergency Response Plan (ERP). The EMP is formulated so as to provide an overall environmental management of the proposed project that will ensure all environmental requirements are met. It is also meant to facilitate compliance with environmental protection or mitigation measures so specified. Project execution for the oil and gas industry typically includes established safety, health and environmental programmes. The EMP should include ERP which outlines the organizations, resources and procedures to be taken in the event of an emergency.

In Malaysia, the preparation of EIA reports together with all the processes involved must be carried out by registered EIA consultants and shall be in accordance with the guidelines prescribed by the Department of Environment. Thus any EIA reports which are conducted by consultants who are not registered with the Department will be strictly rejected. Under section 34A, there are two EIA reports that must be prepared by the consultant, namely the preliminary EIA and the detailed EIA. The former is an assessment of impacts due to those activities that are prescribed while the latter is a procedure undertaken for those projects with major or significant impacts to the environment. Review of the preliminary EIA assessment reports is carried out internally by the Department of Environment. However, the detailed EIA assessment report will be reviewed by an ad hoc review panel. Recommendations arising from the review of these EIA reports are forwarded to the relevant project approving authorities. These are the government authorities that have the task of deciding whether or not a project should proceed. For offshore projects that are beyond the limits of the Malaysian territorial waters, the approving authority is the Ministry of Domestic Trade and Consumers affairs. While the approving authority may have the power to approve the project, it is a legal requirement for the project proponents to submit proof to the Department of Environment that any conditions attached as pre-conditions to report approvals are being complied with, and that proposed impact management measures are being implemented.

To ensure transparency and in its effort to improve the public delivery system, the Department of Environment displays in its website all EIA reports under review; both preliminary and detailed assessments, as well as all reports that are approved and not approved. Under section 34A, criminal sanctions are imposed on those who failed to submit the EIA report to the Department of Environment or those who failed to abide by the conditions attached. Penalties for contravention of the provisions include a fine of up to Ringgit Malaysia (RM) 100000 or imprisonment for a term not exceeding two years or to both, and to a further fine of Ringgit Malaysia (RM) 1000 for every day that the offence is continued after a notice of compliance has been served. According to the Department of Environment, in 2009, a total of 277 EIA reports were received and a total of 1289 enforcement investigations were conducted to check on the progress of projects and compliance of EIA approval conditions. Consequently, the Department served 867 notices or return directives, and 53 compounds to those who contravened the compliance. On the same year, the Department charged 28 cases in court for non compliance of section 34A with the total fine imposed of about Ringgit Malaysia (RM) 250000.

## 4. Conclusion

This paper has examined the application of EIA in dealing with marine environmental issues associated with the oil and gas activities and identified its role as preventive and precautionary measures to mitigate possible adverse impacts of these activities on the seas of Malaysia. Since EIA is made mandatory under the law, the relevant authority has a legal mandate to impose it on any identified projects throughout the country. For a developing country, as well as a maritime nation that is well-endowed with rich marine resources, Malaysia must find a linkage between economic prosperity and marine environmental wellbeing. In this regard EIA is significant as it is able to help balance the conflicting needs for development in the oil and gas sector and marine biodiversity conservation. The EIA under review demonstrates that this regulation provides a framework for information analysis and decision making, which when supported by various processes that take into consideration economic and environmental factors, deliver sustainable results. Malaysian experience has shown that the outcome of the implementation of the EIA amongst the oil and gas industry has been positive. EIA enforcement which is self regulatory places increasing responsibility on the industry to provide assurance that the law is met. It also requires them to place more emphasis on establishing effective environmental management systems within their establishment. Oil and gas industry in Malaysia is expected to grow to meet her demanding economic needs. Thus, it is important for Malaysia to ensure that EIA continues to be relevant in consonant with the country's environmental agenda and sustainability target.

## 5. References

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