

AIR QUALITY ISSUES IN THE ENVIRONMENTAL IMPACT ASSESSMENT REPORTS OF HOUSING AND RESORT & RECREATIONAL PROJECTS

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Abstract

Air quality issues are becoming of greater concern to the society because of the negative effects to human beings and the environment. This paper describes the results of a review on air quality issues in fifty (50) Environmental Impact Assessment reports (EIA) prepared for housing and resort & recreational projects in Malaysia. The results show that 56% of the evaluated reports are in need of detailed assessment. It was found that around 38% of the reports have described the monitoring methods quantitatively. In term of impact identification and prediction 56% of the reports have briefly addressed the issue. In 12% of the reports the mitigation measures were explained too briefly. The overall assessments of 64% of the reports were acceptable. It can be concluded that more concern should also be given to the monitoring of other pollutants such as CO, CO₂ and NO₂, not only Total Suspended Solid (TSP). Standard mitigation measures for the housing and resort & recreational projects should be determined. The project proponent should be legally bounded to ensure that he will be committed to implement the mitigation measures.

Keywords: DOE, EIA, Housing, Malaysia, Resort and Recreational, TSP.

Introduction

Air is a resource not confined by political or geographical boundaries. It has immense social, economic and environmental significance. Air pollution results in a number of problems including, public health and environmental quality, economic and social. The expected excessive amounts of air pollutants from certain industry can prevent it from getting the required approval from the local authorities [8].

Environmental deterioration occurred due to the rapid urbanization in the developing world, urban air pollution is still on the rise at many cities worldwide, or has experienced only small improvements [3]. Air pollution normally refers to pollution of the atmosphere within which most pollutants have a varied life time before they are washed out by rain, transformed by reaction, or deposited to the ground [5].

Air Quality Impact Assessment (AQIA) is a mechanism, which aids the efficient use of the air resource, where it is used, to identify, predict, and evaluate critical parameters and to identify the potential changes of air quality as a result of emissions from new proposed projects, to form a screening device for setting priorities in pollution control, to be used as a tool to test alternative project design at an early stage and aid the identification of the most suitable site in terms of benefit maximization and reduction of harmful effects and finally to identify the type of industry this can be accommodated in an area while maintaining good air quality [8].

In the United States, the National Environmental Policy Act (NEPA) requires preparation of an environmental impact statement (EIS) when there is a potential for significant environmental impact by a major federal action [10].

Decision makers and non-governmental organizations were also became more concern to keep the air within acceptable quality. Rising discomfort, increasing airway diseases, and decreasing productivity are amongst the effects of the emission of particulate and gaseous from industries and auto-exhaust on to human being [6].

In Malaysia environmental quality is regulated under the 1974 EQA. EIA is required under the *Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order, 1987*, Section 34A of the *Environmental Quality Act, 1974*. All relevant new development projects are required to submit Environmental Impact Assessment (EIA) reports. The reports are normally examined in accordance to EIA procedure as established by the DOE.

The EIS review is an effective quality control tool. It could improve the contents of EIA reports according to standards and helps planners in carrying out the recommendations of EIA reports [9].

There are currently many local environmental consultants (74) engaged in EIA. DOE has delegated the job of approving the EIA's to the state level, for nearly one decade the state DOE deals with preliminary EIA. However, there are some deficiencies in the process such as, lack of staff with sufficient analytical skills, need for greater institutional capacity and absence of effective monitoring of mitigation measures [1].

Scope and Approach of the Research

This research was conducted to evaluate the air quality issues being addressed in the approved preliminary assessment of housing and resort & recreational projects:

- To evaluate the adequacy of the monitoring carried out.
- To evaluate the adequacy of the prediction and identification of the impacts that expected to result due to development project activities.
- To evaluate the appropriateness of the mitigation measures being proposed to curb air pollution problems.

The main assumption used for this research is that the impacts of the construction phase are localized and of short duration. The duration of construction phase varies according to the size, location and type of the project. The air quality impact that arises from the construction phase is mainly particulate matter and dust that may result from construction activities and gaseous pollutants mainly from the vehicular emissions [7].

EIA reports of fifty projects (25 of housing and 25 of resort & recreational) were reviewed. The study was confined to the monitoring methods, with focus on monitoring parameters and their concentrations, locations and number of monitoring stations, monitoring methods and monitoring instruments, impacts identification and prediction,

with the focus on the prediction of all the potential sources of pollutants, and the mitigation measures related to air quality with the focus on the measures suggested to eliminate the negative impacts of the project activities.

Results and Discussion

This section discusses the findings from the review of the monitoring methods used, impacts identification and prediction and the suggested mitigation measures.

Monitoring Methods

The reports were reviewed with focus on monitoring parameters (TSP, CO, CO₂, NO_x, SO_x) and their concentrations, locations and number of monitoring stations, monitoring methods and monitoring instruments. The review showed that 40% of the housing and 52% of the resort & recreational reports presented only a qualitative description (e.g. high or low) with no concentration values for the air quality parameters. 52% of the housing and 24% of the resort & recreational reports were presented quantitatively with explanation of test types and concentration ranges given. The remaining 8% of the housing and 24% of the resort & recreational reports were devoid of monitoring methodologies. Figure 1 shows the nature of the reports in terms of qualitative and quantitative description of the air quality monitoring.

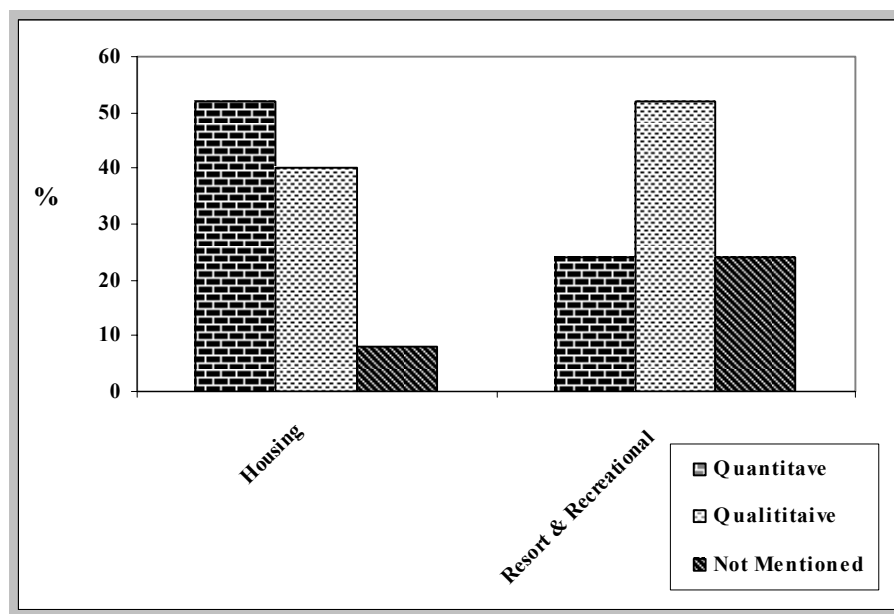


Figure 1 - Monitoring methodologies in reports

Thus 48% of the housing and 76% of the resort & recreational reports are either lacking in details with regards to monitoring or do not have it at all. This should raise concern as it is important to conduct the monitoring process in a proper manner in order to predict the environmental impacts of the activities.

Impacts identification and prediction

Impacts identification and prediction are the most important component of EIA. Its importance lies in the fact that when properly executed this would suggest the type and extent of impact on man and environment that may be expected from a particular activity or substance. This information would also assist in deciding mitigation measures.

It could be seen from the review that 36% of the housing and 24% of the resort & recreational reports are classified as adequately articulate, regarding impacts identification, with explanation of the sources and effect of impacts given. 56% of both housing and resort & recreational reports could be grouped as brief and lacking in addressing the subject, in these cases the reports only stated the sources of dust without giving details about other pollutants.

Whilst 8% of the housing and 20% of the resort & recreational reports had addressed this issue too briefly with no details about the sources of pollutants (i.e. to indicate one source of the pollutants that may arise due to the project activities). Figure 2 shows how the issue of impacts identification and prediction was addressed in the reports.

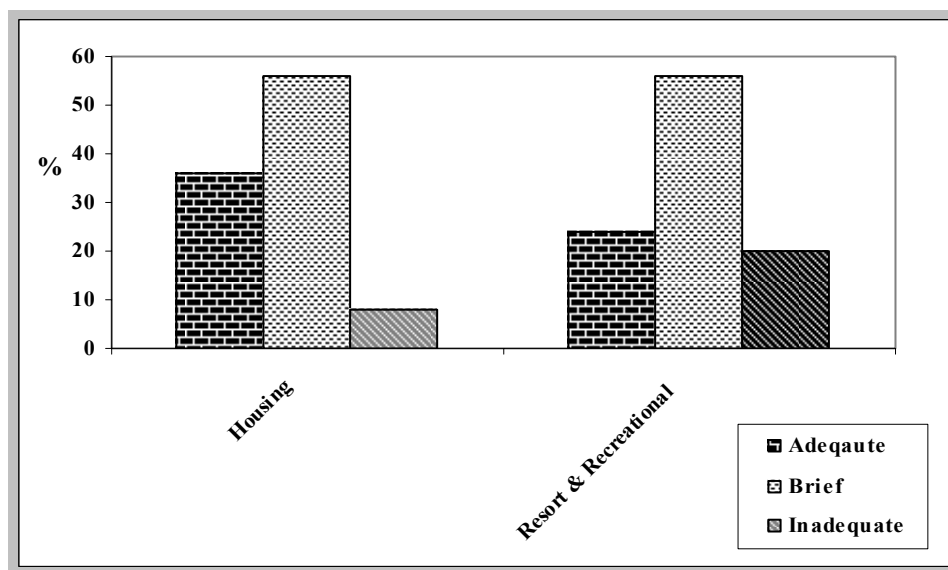


Figure 2- Impacts identification and prediction as addressed in reports

The coverage of impacts identification and prediction (Figure.2) shows that more than half (64%) of the housing and 76% of the resort & recreational reports were deficient regarding the addressing of impacts prediction. This is a serious matter and would merit attention.

Mitigation measures

The impacts that may result from housing and the resort & recreational projects are mainly dust during construction activities and gaseous pollutants emitted from vehicles. The review showed that only 20% of both housing and resort & recreational reports have sufficient details and descriptive explanation on mitigation measures that should be adopted to prevent or reduce negative impacts during the construction phase of housing and resort & recreational developments, 68 % of both housing and resort & recreational reports have described this issue briefly by listing the most common measures (e.g. water spraying, tyres washing and banning of open burning). The remaining (12%) of both reports only presented too briefly, by indicating some mitigation measures that should be taken. Figure 3 shows the coverage of mitigation measures given in the reports.

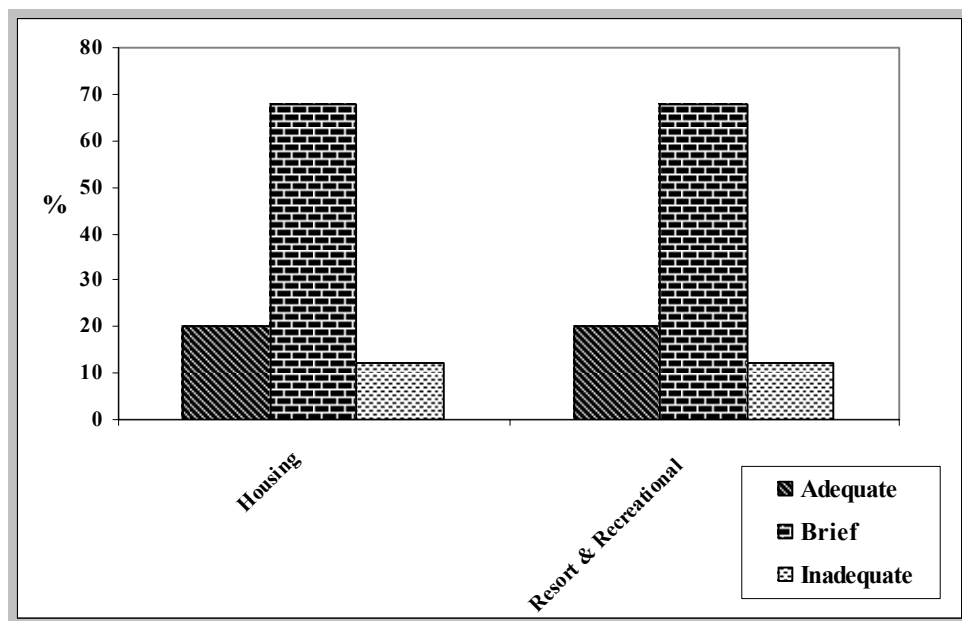


Figure 3 - Coverage of mitigation measures in reports

A summary on the percentage of occurrence of mitigation measures in the reports is presented in Table 1. Most of these measures are basically control measures rather than preventive.

Table 1- Summary of the occurrence percentage of mitigation measures in the reports

Project Type	Mitigation measures	Percentage (%)
1. Housing	Areas frequently used by vehicles to be wetted by spraying with water at least twice a day and more frequently on dry days.	48
	Open burning of any construction waste should be strictly prohibited.	60
	Wastes should be disposed at designated dumping ground approved by the local authority.	44
	Limitation of truck speed to 20km/hr on unpaved roads.	44
	Tyre washing facility, which includes a sump for collection of washings, settling basin, water recycle and sediment disposal to be installed at entrance to public roads.	84
	Heavy machineries and vehicles should be properly maintained to reduce excessive smoke emissions.	8
	Earth materials transported in dump trucks should be completely covered with tarpaulin sheets.	4
	Vegetation within the construction site should be maintained as much as possible to “filter and absorb” excessive gaseous pollutants emitted by the construction machineries and vehicles.	64
2. Resort & Recreational	Areas frequently used by vehicles to be wetted by spraying with water at least twice a day and more frequently on dry days.	76
	Open burning of any construction waste should be strictly prohibited.	56
	Wastes should be disposed off at designated dumping ground approved by the local authority.	32
	Limitation of truck speed to 20km/hr on unpaved roads.	32
	Tyre washing facility, which includes a sump for collection of washings, settling basin, water recycle and sediment disposal to be installed at entrance to public roads.	52
	Heavy machineries and vehicles properly maintained to reduce excessive smoke emissions.	40
	The earth materials transported in dump trucks should be completely covered with tarpaulin sheets.	44
	Provide vegetated buffers along major roads.	12

The purpose of mitigation is to eliminate or reduce the negative impacts that may result from development projects. The review has shown that this section has failed badly in 80% of both housing and resort & recreational reports. This seems that mitigation

measures had been addressed inadequately and if the same practice will continue then it may result in excessive negative impacts.

The approving authority usually attached conditions when the project is approved. This includes implementation of mitigation measures and demonstration of the result of the EIA via environmental monitoring and audit [2].

Overall Assessment

The overall assessment was confined with assessing of the monitoring methods, impacts identification, mitigation measures and communication of results of the air quality section in the EIA reports. The assessment method was to give each category (monitoring method, impact prediction, mitigation measures and communication of results) a suitable grade according to the addressing of the issues in the reports, where the grades were as shown in Table 2. Then each category assessment grade has been multiplied by a specific weight according to the category importance, the sum of these grades result is the overall assessment of the air quality issues in the EIA reports.

Table 2- Assessment grades and their explanations

Grade	Explanation
6-6.9	Generally well performed, no important tasks left incomplete.
5-5.9	Adequate and complete, only minor omissions and inadequacies.
4-4.9	Can be considered acceptable despite omissions and/or inadequacies.
3-3.9	Can be considered inadequate because of omissions and/or inadequacies.
2-2.9	Unacceptable, significant omissions or inadequacies.
1-1.9	Rejectable, important task(s) poorly done or not attempted.
0	Not applicable to the context of this statement.

Adopted from [4]

To know the overall assessment, the assessment of each item, monitoring method, impacts prediction, mitigation measures and communication of results should be multiplied by a weight which is given according to the importance of the item. Thus the weight was given as, 25 % for monitoring method, 25 % for impact identification, 40 % for mitigation measures and 10 % for communication of results.

The review shown that 4% of the housing and 8% of the resort & recreational reports were unacceptable, 28% of the housing and 32% of the resort & recreational reports were inadequate and 68% of the housing and 60% of the resort & recreational reports were acceptable. This give negative indication about the quality of the addressing of air quality issues in the EIA reports where 32% of the housing and 40% of the resort & recreational reports have addressed the issues in improper standard. Figure 4 shows the coverage of overall assessment in the reports.

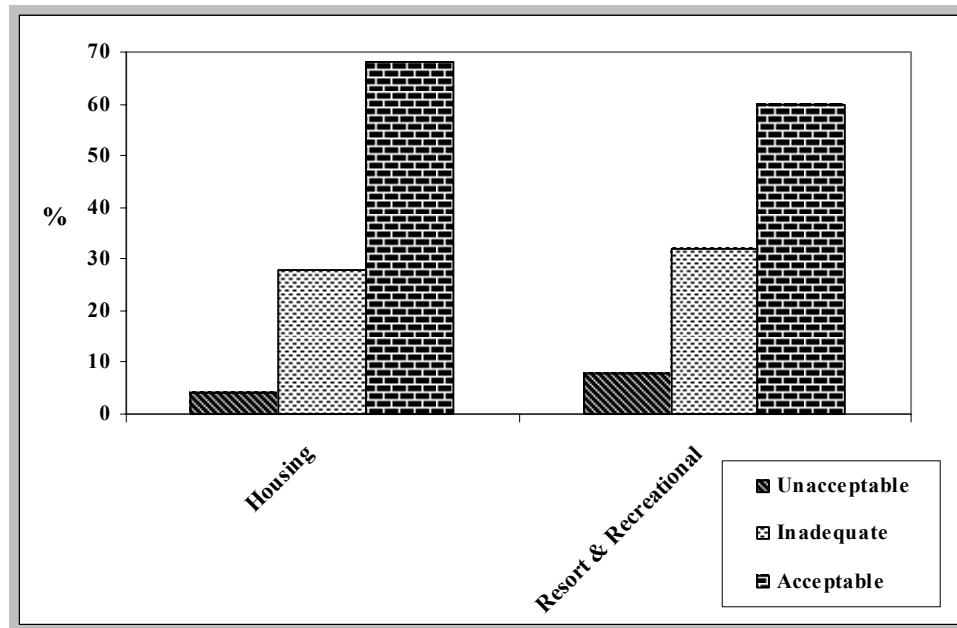


Figure 4 - Coverage of overall assessment of the reports

These bad results will reflect on the implementation of the mitigation measures which are directly linked to the existence of the negative impacts of air pollution.

Conclusions

The present reviews on EIA reports have shown that there was wide variation in the treatment of different issues (i.e. monitoring methods, impacts identification & prediction and mitigation measures). Many of the reports were lacking and deficient in their coverage.

It appears that the authorities need to be more stringent in the handling of the reports. It is also important that monitoring details (methods, parameters, etc.) and other requirement of the reports have to be streamlined and conveyed to prospective developers. The monitoring method should be clearer and sufficiently descriptive to cover all the expected pollutants and not only dust. All impacts should be determined clearly during the impact identification stage and the implementation of the mitigation measures should be linked to various stages of the project. More stringent rules and penalties may be imposed so that the proponent will be committed to implement the mitigation measures properly. It will not be beneficial to the environment if mitigation measures sound very convinced in the reports but not at all carried out.

References

- [1] Briffett, C. Obbard, J. P. and Mackee, J. (2003). Towards SEA for the developing nations of Asia. *Environmental Impact Assessment Review*. **23**,171–196
- [2] Department of Environment, Malaysia (1995). Environmental Impact Assessment Guidelines for Municipal Solid Waste, Sewage Treatment and Disposal Projects, Putar Jaya.
- [3] Jorquera, H. (2002). Air quality at Santiago, Chile: a box modeling approach—I. Carbon monoxide, nitrogen oxides and sulfur dioxide. *Atmospheric Environment*. **36**, 315-330.
- [4] Lee, N. & Colley, R. (1992). *Reviewing the Quality of Environmental Statements*. Occasional Paper 24 (Second Edition). EIA Centre, Department of Planning and Landscape, University of Manchester, Manchester, UK.
- [5] Petts, J. Eduljee, G. (1994). *Environmental Impact Assessment for Waste Treatment and Disposal Facilities*. John Wiley & Sons Ltd: England.
- [6] Puliafito, E. Guevara, M. & Puliafito, C. (2003). Characterization of urban air quality using GIS as a management system. *Environmental Pollution*. **122**, 105-117.
- [7] Ramli, N. A. Wathern, P., and Razman, M. R. (2002). Issues of air pollution in environmental impact assessment of development projects. Proceedings International Conference Environmental Management: Ten Years after Rio. 2002. pp484-496. Eds Jamaludin M.J., et al.
- [8] Shen, T. T. (1989). Air Quality Impact Assessment, *Encyclopedia of Environmental Control Technology*, (Edited by Cheremisinoff, P. N.) **vol.2**, Gulf Publishing Company, USA.
- [9] Simpson, J. (2001). Developing a review package to assess the quality of EA reports of Local Authority structure and local plans in the UK. *Environmental Impact Assessment Review*. **21**, 83–95.
- [10] Tzoumis, K. & Finegold, L. (2000). Looking at the quality of draft environmental impact statements over time in the United States: Have ratings improved?. *Environmental Impact Assessment Review*. **20**: 557–578.