

Title

Effectiveness of managing Environmental impacts of road construction in Sri Lanka. A case study of Peradeniya – Chenkaladi Road.

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Abstract

The non-adherence to the terms of Environmental Management Plan (EMP) has become a critical issue in environmental management with regard to road development projects in Sri Lanka. The objective of the study was to examine how far the recommended mitigation measures proposed in Environmental Impact Assessment (EIA) were implemented with respect to road projects. Qualitative data was analyzed using inductive research approach. The study has found that EMP comprehensively included mitigation measures for each predicted environmental impact. The extent of implementation of mitigation measures was satisfactory except the measures for impacts of soil erosion and siltation. Other impacts were found to be effectively mitigated. Further it was found that community participation was poor in EMP implementation. Institutional participation was found to be at a low level. Research emphasizes the critical need of environmental monitoring in EIA process throughout project implementation in order to achieve required level of mitigation.

Keywords: Environmental Impact Assessment (EIA), Environmental Management Plan (EMP), Environmental Monitoring Plan (EMoP), Impact Mitigation, Environmental Monitoring.

Introduction

Environmental Impact Assessment (EIA) is widely used for identifying the potential impacts of new developments (Glasson et al, 1999), and stands as an important link incorporating environmental factors in to overall project design. The aim of EIA is to give the environment its due place in the decision-making process by clearly evaluating the environmental consequences of a proposed activity before action is taken. The mitigation of environmental impacts is thus a key stage of the EIA process (Wood, 2003) and defined as “measures envisaged in order to avoid, reduce and if possible, remedy significant adverse effects” (CEC, 1985). Mitigation should occur as an iterative part of the EIA process, developing

and refining measures to address the significant impacts identified during the other stages of EIA (Glasson et al, 1999).

Development of road networks causes impacts to varying degrees on the physical, ecological and social environment. Each project occurs in a unique environment, each will have a different set of environmental priorities to manage and different elements may come in to play during various phases of the works. Road development projects are listed as prescribed¹ projects which require to go through Environmental Impact Assessment (EIA) process to systematically evaluate the potential adverse effects on the environment. Potential environment elements may include air quality, water quality, soil, cultural heritage, waste management, site contamination, fauna and flora, noise, greenhouse gas emissions and natural resource use.

Background

Proper management of the environment is a key part of sustainable development. Yet often little attention is paid for environmental protection, regulation and management work in practice and what can be done to strengthen them despite the legal requirement. In such situations environmental management is often seen as secondary to other concerns such as project cost. It is evident that despite the strong legal regime and all the commitments to protect the environment, there are lapses in environmental performance in certain projects.

Many road development projects continue to impact negatively on the environment despite being subjected to the EIA process. The main aim of the EIA is to avoid/ reduce and mitigate the anticipated environmental impacts of the specific development. Although a variety of mitigation measures may be proposed in the EIA, they must be implemented if environmental impacts are to be successfully addressed. Therefore EIA should reduce the anticipated environmental impacts of the road projects if the EMP is implemented in an effective way.

Research Problem

There are questions over whether EIA is being used to its full potential. Current practice has focused on the pre-decision stages of the process, which means that little attention is paid to post decision phase of the EIA. However, there is a lack of scientific information about the current practice of EIA in Sri Lanka.

¹ A prescribed project is one which is of significance, particularly economically and socially, to a region of a country/state, which shall not be implemented without unless an environmental impact assessment is carried out (cea.lk)

There are complaints from public and stakeholders that little attention is being paid to the implementation of EIA mitigation measures. Therefore it is not fully known whether or not the recommended EIA mitigation measures recommended in EMP are being implemented.

Objectives

The study intended to assess the effectiveness of implementation of mitigation measures incorporated in Environmental Management Plan (EMP) identified during the Environmental Impact Assessment (EIA) carried out for road projects taking Peradeniya – Chenkaladi road as a case study.

Specific Objectives

- i. To evaluate the mitigation measures proposed for each predicted environmental impact of Peradeniya – Chenkaladi road
- ii. To evaluate impacts mitigated by implementation of mitigation measures

Research Methodology

The study carried using inductive approach, using theory free observations. The information required for the research acquired as a collection of primary and secondary data. Secondary data comprised of analysis of documents and literature review from published works and books. After reviewing the secondary data, the further information requirement was specified. Literature review, Document analysis, Questionnaire are the methods used to gather primary and secondary data. The data sources were; EIA report, EMP and EMoP prepared out for the road improvement project, Environmental Method Statements, Non-compliance records, field inspection reports, project progress reports, environmental clearances, reports from the donor agency, photographs (taken during the preconstruction and construction period), compensation reports, and public complaint registers.

EIA of the project was investigated for the predicted impacts and proposed mitigation measures. Monitoring data was reviewed to identify the impacts occurred and implemented mitigation measures, and to identify whether the implementation of EMP had mitigated the impacts. A semi-structured questionnaire survey was completed to explore the views of the practitioners to gain information to make inferences related to the research. Quantitative and qualitative data was analyzed using graphical and tabulation methods. Criteria for review and evaluation of qualitative data were formulated based on the conceptual framework to evaluate the effectiveness in achieving the environmental mitigation objectives. Analysis of the EIA, EMP, field monitoring and compliance records which are qualitative data were

carried out against defined criteria. Analysis of questionnaire was completed by searching for information associated with EIA follow-up practice, constraints, and improvements.

Key Findings

The records showed the presence of major impacts throughout the construction period related to earthworks, such as soil erosion/siltation of downstream water bodies and lands, landslides/soil instability of slopes, water quality deterioration by siltation and dust, mud and disposal of excavated materials and related soil erosion. Mitigation measures for these impacts were not implemented in the worksite in several instances, and implementation delayed after complaints and monitoring sessions. Impacts of safety issues, traffic management during construction were effectively minimized. However for impacts such as soil erosion and siltation, slope instability, silt contamination of water sources/downstream lands, though mitigation measures are implemented the results might not been effective due to the geographic location (terrain condition) of the project, soil type, presence of fresh water springs and rainfall. The monitoring plan played a major role in EMP implementation and was adequate in implementing the EMP. Monitoring was limited to the construction phase. However community and institutional participation/collaboration was limited and poor in mitigation and monitoring.

Weaknesses in EMP implementation were; the absence of proper documentation format for reporting and communication of monitoring and noncompliance to the EMP to relevant parties, poor community and institutional participation during the EIA process at the appropriate time, limited capacity in technological, financial and professional personnel aspects and lack of experience of EIA consultants is another factor which limited the use of EIA to its full potential. Insufficient financial allocation for the environmental impact mitigation component and lack of awareness of environmental conservation of the community are other factors affecting the EMP implementation resulting impact mitigation given a low priority.

Conclusion

Environmental impacts caused by construction were related to the geographical distribution of the project. It was found that EMP comprehensively incorporated all the impacts and recommendations identified in the EIA. Mitigation measures proposed for soil erosion, siltation and land instability were found to be adequate; however its implementation was not satisfactory. However EIA follow up (environmental monitoring, communicating observations) reduced the weaknesses, inadequacies of the implemented mitigation measures and improved effectiveness though the initial implementation of EMP was not

effective and inadequate. The study revealed the importance of the two characteristics of the EMP i.e. "tried and test" nature of mitigation measures and specificity to the project area. It is beneficial for the developer to have access to 'tried and tested' mitigation techniques with monitoring and communication of necessary recommendations. Community and institutional participation, systematic reporting method for monitoring and communication, capacity of stakeholder institutions are factors affecting the effectiveness of EMP implementation and those aspects are need to be improved to use the EIA in its full potential.

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