



Efficacy of Mitigation Measures in Kenya EIA Process: An Opportunity for Urban Disaster Risk Reduction

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ABSTRACT

The effectiveness of mitigation in EIA is vital in preventing adverse environmental impacts thus ensuring sustainable development. However, while EIA has been embedded within the development planning processes in many countries, successful implementation has not been evident in developing countries. Despite EIA being carried out on most development projects there still remains the challenge of implementation of EIA mitigation measures. It's for this reason that the study evaluates level of implementation of mitigation measures for the selected projects and the utility of EIA mitigation conceptual model in enhancing the effectiveness of mitigation in EIA. A cross-sectional design was adopted to collect and analyse data. Data from thirty (30) EIA reports conducted between 1999 and 2016 were purposively sampled to provide information about the quality of EIA reports in terms implementation proposed mitigation measures. The modified EIS quality review package and mitigation guidelines were used to gather and grade the quality of EIA reports in terms of the impacts and mitigation measures. Regarding the practical implementation of mitigation measures proposed in the reviewed EIA reports, three purposively selected EIA projects, environmental managers, local communities surrounding them and field observations provided the required data. The key findings reveal that the level of mitigation implementation in EIA was partly implemented. Among the six mitigation measures projected, the proponent implemented fully two mitigation measures only relating to impact on land use and impact on soils. The other four mitigation measures relating to air quality and noise pollution control, health and safety, solid waste management and social and economic impacts were implemented partly. The findings of the three projects reveal that mitigation measures are inadequately implemented. The study concluded that EIA reports had shortcomings in impact identification and implementation of mitigation measures. The study recommended that active public participation of local communities can make the implementation of mitigation measures effective.

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1.1 Introduction

Glasson *et al.* (2013) defines Environmental Impact Assessment (EIA) as an examination, analysis and assessment of planned activities with a view to ensuring environmentally sound and sustainable development. It's a systematic process to predict and assess the likely environmental impacts from the proposed projects. EIA is thus an anticipatory, participatory environmental management tool. The mitigation of environmental impacts is thus a key stage of the EIA process, and is therefore considered the heart and foundation of EIA (Wood, 2003; Tinker *et al.*, 2005). The function of mitigation is to inform and influence decision-making and ultimately contribute to sustainable development (Glasson *et al.*, 2013). According to Momtaz (2002) the EIA process without adequate mitigation measures and the subsequent enforcement of their implementation cannot be effective.

EIA in Kenya is about 18 years old since it was formulated and is administered by the National Environmental Management Authority (NEMA) as per Environmental Management Coordination Authority (EMCA,

1999) and Environmental Impact Assessment and Audit Regulations, 2003. It was introduced with the aim of ensuring that a particular development intervention is not posing any threats to the environment (GOK, 1999). However, while it is acknowledged that there has been increased awareness on EIA and in general the Kenya EIA system has influenced some development decisions, there remains the challenge of implementation of EIA mitigation measures. Despite EIA being carried out on most development projects, it is uncommon for developers of projects to use the EIA reports as a basis for environmentally sound implementation of their projects. There has been increasing concern on the number and frequency of disasters, land degradation, deforestation and unplanned development. Several disasters including collapse of buildings, landslides, floods and fire disasters have caused huge damage to lives and property (IRIN, 2011). The extent to which Kenya EIA processes implement mitigation measures has not been adequately researched. The impacts of development activities are expected to further exacerbate as a result of increased severity and frequency of

climate related hazards as a result of ongoing climate change (IPCC, 2012).

The argument in this study is that, implementation of mitigation measures proposed in EIA reports through EMPs is a holistic way of enhancing the effectiveness of mitigation in EIA. However, the few studies that have been undertaken have mainly focused on individual EIA dynamics such as public participation rather than aspects of systematic evaluation of the actual impact and influences of EIA on the environment. In pursuing this theme, the overarching objective of the study was to determine the extent of implementation of the recommended mitigation measures for EIA in Kisumu city. It is important that the mitigation measures are effectively implemented (Noble & Storey, 2005). This paper studied three projects in order to understand the implementation of proposed mitigation measures, which included; Development of Residential Maisonettes (Hippo Park Village, HPV), Rehabilitation of Kisumu Waste Treatment Plant (KWTP) and Kisumu Northern By-pass roads (KNBP). The three projects were selected based on development sector, size of the project, year of implementation, quality of EIA in terms of implementation of mitigation measures, projects implemented prior to 2014, and projects that underwent full EIA process.

1.2 Statement of the Problem

In Kenya, the role of EIA in protecting the environment from social and environmental impacts of urban development projects is not well documented. Very little seems to be known about effective implementation of proposed mitigation measures in EIA. The quality of EIA to which the mitigation measures proposed and implemented by proponents is not well understood. Studies done in Kenya's EIA have had a partial view on the implementation of proposed mitigation measures. A thorough understanding of the implementation of the mitigation measures are required (Morrison-Saunders & Arts, 2012). A comprehensive study of the EIA implementation of proposed mitigation measures in Kenya is necessary in an attempt to fill this gap. Kenya has seen an upward trend in the number and severity of development-induced disasters (IRIN, 2011). If this trend continues, the environment risks will increase degradation to unsustainable levels (Meck, 2013). This study therefore provides information on the barriers to the effective implementation of proposed mitigation measures in EIAs and thus provides recommendations to modify and advance EIA to achieve sustainable development. There is an urgent need for information regarding implementation of mitigation measures to enable environmental managers to protect and conserve the environment sustainably. The study objective was the determination of the extent of implementation of the proposed mitigation measures for Kenya's EIAs processes. Study question being, what is the level of implementation for proposed EIA mitigation measures in the study area?

1.3 Justification of the Study

In Kenya, the role of EIA in protecting the environment from social and environmental impacts of urban development projects is not well documented. Very little seems to be known about effective implementation of proposed mitigation measures in EIA. The quality of EIA to which the mitigation measures proposed and implemented by proponents is not well understood. Studies done in Kenya's EIA have had a partial view on the implementation of proposed mitigation measures. A thorough understanding of the implementation of the mitigation measures are required (Morrison-Saunders & Arts, 2012).

1.4 Significance of the Study

The study is very important for its contributions towards sustainable development and safe infrastructure. The environmental agencies, scholars and both national and county governments will benefit from the study in reviewing the policies regarding implementation of mitigation measures for fostering sustainable development.

1.5 Scope of the Study

The study scope was EIA licensed development projects in Kisumu city from 1999 to 2014, within which the total number of licensed projects in Kisumu city were 300. The study further targeted lead agencies and other stakeholders in environment.

2.0 Literature Review

The effective disaster risk reduction lies in understanding natural hazards and the vulnerability of society, the economy and built and natural environments to the hazards (Birkmann, 2006; UNISDR, 2005). Disasters occur from the impact of a variety of natural and technological hazards and their combinations. Tobin and Montz (2009) define environmental hazards as the potential interaction between forces of the physical environment and the human-use system such that there is a negative impact on society – the potential for disaster. Environmental degradation, settlement patterns, livelihood choices and human behaviour are all factors contributing to disaster risks, which in turn results in even more harmful effects on human development and environmental assets.

The upward trend in the number of development-induced disasters worldwide, as highlighted in the Global Assessment Report 2011, especially in developing countries, supports the argument that development increases the risk of disasters. Many economic development interventions have inadvertently created new forms of vulnerabilities, especially in low and middle-income countries that also have poor governance records (UNISDR, 2011). Hence, ill-planned mal-development initiatives can be labelled as channels for increased disaster vulnerability and hazard risk, especially leading to development-induced disasters. Disaster risks are created over time by environmentally unsustainable development projects.

The Sendai Framework (2015) whose primary role is to reduce disaster risk as envisioned in target number four (4) that states, "Substantially enhance international cooperation to developing countries through adequate and sustainable support to complement their national actions for implementation of this framework by 2030 (UNISDR, 2015)"

3.0 Research Methodology

The study site for this research is the city of Kisumu, the third largest town in Kenya and the principal town in the Western part of the country. The city covers an area of approximately 417 Km², with a total population estimated to be 500,000 people (GOK, 2009). A cross-sectional design and descriptive design were used to address research question with respect to implementation of mitigation measures of the EIA processes. Purposive sampling was used on EIA Key stakeholders and have a clear understanding of those involved in the implementation of projects approved by NEMA. Stratified random sampling was used to divide members of the population into homogeneous subgroups. This included stratifying categories of EIA stakeholders into independent subgroups including EIA experts, EIA regulators, public involved in EIA and project proponents

The study used 10% (Mugenda & Mugenda (2003) formula) of the total number of licensed commercial projects

within Kisumu city. A total of 30 EIA reports of different projects were selected irrespective of different development sectors and the year of the EIA preparation. The paper made use of: amended Lee and Colley (1992) EIS quality review package and mitigation guidelines, questionnaires and observations, interview guides and focus group discussion. Data from EIA reports (EMP) formed the basis of understanding the quality of EIA reports in terms of implementation of proposed mitigation measures. Statistical Programme for Social Scientist (SPSS) version 20.0 was used as the analysis support tool. Interviews and FGDs were later transcribed and loaded together with notes taken during the interviews.

4.0 Results and Discussions

4.1 Implementation of Proposed Mitigation Measures

The proposed EIA mitigation measures were identified through document review of EIA reports. During this document review, all the mitigation measures proposed in the Environmental Impact Statements (EISs) for the three selected projects were recorded using a document review guide. These urban projects had been reviewed and assessed by certified EIA practitioners during the EIA process and found to have significant impacts on the environment. As a follow-up to desk review, sites visits were conducted as verification towards implementation of proposed mitigation measures. On-site observations revealed that most mitigation measures were implemented partly. The following mitigation measures were therefore suggested for impact mitigation. The research sought to categorize the identified mitigation measures by type. Consequently, the proposed mitigation measures were grouped into five distinct types: (i) avoidance, (ii) reduction, (iii) repairing, (iv) enhancing and (v) compensation. Figure 4.1 summarizes the distribution of the proposed mitigation measures in EISs by type.

% Category for Mitigation Measures

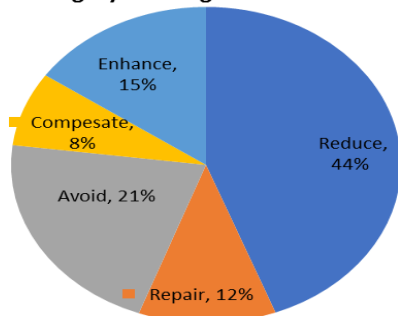


Figure 4.1. Categories for mitigation measures proposed in EIA report.

Source: Researcher, 2017

Figure 4.1 shows that the distribution of mitigation measures in the sampled 30 EIA reports was skewed towards impact reduction which constituted 380 (44.2 percent) of the 860 proposed mitigation measures. Avoidance measures constituted 184 (21.4 percent) of the 860 mitigation measures identified in the EIA reports, enhance 15%, repair 12% and compensate 8%.

The environmental impacts and recommended Mitigation measures in the EMPs were analysed for the three selected projects. The three projects were studied in order to understand the implementation of proposed mitigation measures. The projects included; Development of Residential Maisonnets (Hippo Park Village HPV), Rehabilitation of Kisumu Waste Treatment Plant (KWTP) and Kisumu Northern By-pass roads (KNBP).

Site based evidence of mitigation Measures implementation for HPV revealed that among the six (6) mitigation measures, the proponent implemented fully four mitigation measures relating to air quality management and noise pollution control, Health, safety and disaster risk management, Energy consumption, and Drainage management. The other two mitigation measures relating to water quality management and disposal of solid waste were implemented partly. The status of mitigation measures implemented by the proponent of Kisumu sewerage treatment plant revealed that out of seven recommended mitigation measures, the proponent fully implemented two; health and safety, and biodiversity. Four mitigation measures were partly implemented relating to air quality, impact on Lake Victoria, social impacts and water quality. The proponent did not implement one mitigation measure relating to disposal of solid waste and sludge cake. Finally, for Kisumu Northern By-pass roads, of the six recommended mitigation measures, the proponent implemented fully two mitigation measures only relating to impact on land use and impact on soils. The other four mitigation measures relating to air quality and noise pollution control, health and safety, solid waste management and social and economic impacts were implemented partly. Figure 4.2 illustrates the status of the mitigation measures implements from the three projects.

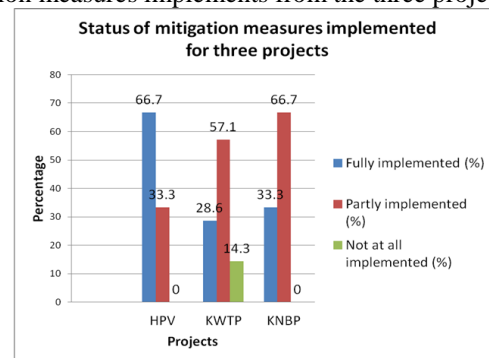


Figure 4.2. Status of mitigation measures implemented for three projects.

Source: Researcher, 2017

The status of the implementation of the major mitigation measures adopted in the three projects is shown in Figure 4.2. Overall status show that 42.1% of the proposed mitigation measures were fully implemented, 52.6% partially implemented and 5.3% not implemented at all. Among the 6 major mitigation measures of HPV, 66.7% (4) measures were fully implemented, 33.3% (2) measures were partially implemented. In the case of KWTP, out of 7 mitigation measures, 28.6% (2) measures were fully implemented, while 57.1% (4) measures were partly implemented. The remaining 14.3% (1) measure was not implemented at all. In the case of KNBP, among 6 mitigation measures, 33.3% (2) mitigation measures were fully implemented, and 66.7% (4) mitigation measures were partly implemented.

Overall, the findings show that no project achieved its environmental management targets in terms of the implementation of recommended mitigation measures. Due to the inadequate implementation of mitigation measures, as revealed in the case of three projects, the significance and effectiveness of EIA as an environmental management tool remained underutilized.

5.0 Conclusions and Recommendations

5.1 Conclusions

The study shows that no project achieved its environmental management targets in terms of the

implementation of recommended mitigation measures. EIA reports are one of the fundamental indicators of the effectiveness of mitigation measures in EIAs, but only subject to the implementation and monitoring of its contents as a system. The effectiveness of mitigation in EIA can only be holistically evaluated by integrating the quality of EIA reports, project EMPs and EIA follow-up.

5.2 Recommendations

The study recommends; strengthening law enforcement for EIA follow up, strengthening public participation, provide adequate resources, enhance EIA capacity, enhance EIA enforcement and monitoring techniques and increase environmental awareness.

References

Birkmann, J. (2006). Measuring vulnerability to promote disaster-resilient societies: Conceptual frameworks and definitions. In J. Birkmann (Ed.), *Measuring vulnerability to natural hazards: towards disaster resilient societies* (pp. 9-54). New Delhi: United Nations University

Glasson, J., Therivel, R., & Chadwick, A. (2013). *Introduction to Environmental Impact Assessment*. Routledge.

GOK (1999). *The Environmental Management and Coordination Act No.8 of 1999*, Kenya Gazette Supplement. Nairobi, Kenya.

GOK (2009). *The 2009 Kenya Population and housing census*, Government press. Nairobi, Kenya.

IPCC. (2012). Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change [Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.-K. Plattner, S.K. Allen, M. Tignor, and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, UK, and New York, NY, USA, 582 pp.

IRIN 2011. Integrated Regional Information Networks. www.irinnews.org/Report/94002/KENYA. accessed 19th October, 2011

Lee N & Colley R 1992: Review of the quality of environmental statements. Occasional Paper, Vol. 24. University of Manchester: Manchester EIA Centre.

Lee, N. and Colley, R. (1992) *Reviewing the Quality of Environmental Statements* Occasional Paper 24, (Second Edition), Department of Planning and Landscape, University of Manchester.

Lee, N. and Colley, R. 1992. *Reviewing the Quality of Environmental Statements*. Occasional Paper 24, Department

of Planning and Landscape, University of Manchester, Manchester.

Meck M 2013: Geochemistry for sustainable development in Africa: Zimbabwe Case Study. In Gurib-Fakim A & Eloff J (eds). *Chemistry for Sustainable development in Africa*, Springer: London.

Meck M 2013: Geochemistry for sustainable development in Africa: Zimbabwe Case Study. In Gurib-Fakim A & Eloff J (eds). *Chemistry for Sustainable development in Africa*, Springer: London.

Mitchell J 1997: Mitigation in environmental assessment-furthering best practice. *EA the Magazine of IEA and EARA*, 28-29.

Momtaz, S. (2002). Environmental Impact Assessment in Bangladesh: A Critical Review. *Environmental Impact Assessment Review*, 22(2), 163-179.

Morrison_Saunders, A. & Arts, J. (2012). *Assessing Impacts: Handbook of EIA & SEA Follow-up*. Earthscan.

Mugenda, O. & Mugenda, A. (2003). *Research Methods: Quantitative and Qualitative Approaches*.

Tinker L, Cobb D, Bond A & Cashmore M, (2005): Impact mitigation in environmental impact assessment: paper promises or the basis of consent conditions. *Impact Assessment and Project Appraisal*, 23, 265-280.

UNISDR (2015). The Sendai Framework for Disaster Risk Reduction 2015-2030: Building the Resilience of Nations and Communities. *Extract from the final report of the World Conference on Disaster Reduction*. Retrieved from <http://www.unisdr.org/we/coordinate/sendai-framework>.

UNISDR. (2005). Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters. *Extract from the final report of the World Conference on Disaster Reduction (A/CONF.206/6)*. Retrieved from http://www.unisdr.org/files/1037_hyogo_frameworkforactionenglish.pdf

UNISDR. (2011). *Global Assessment Report on Disaster Risk Reduction 2011: Revealing risk, redefining development*. Retrieved from <http://www.preventionweb.net/english/hyogo/gar/2011/en/home/index.html>

Wood C 2003: Environmental Impact Assessment in Developing Countries: An Overview. Conference paper on New Directions in Impact Assessment for Development: Methods and Practice 24-25 November 2003, EIA Centre School of Planning and Landscape University of Manchester Manchester M13 9PL.