

Assessment of Environmental Impact Identification and Mitigation Measures in Urban Developments, Kenya

Martin Ndiwa Talian, Stanley O. Omuterema and Samuel S. China

Department of Disaster Mitigation and Sustainable Development, Masinde Muliro University of Science and Technology (MMUST).

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ABSTRACT

Environmental Impact Assessment process 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, quality EIA reports have not been produced in developing countries. Despite EIA being carried out on most development projects there still remains the challenge on the quality of EIA reports that are being written by environmental experts. It's for this reason that the study evaluates the effectiveness of mitigation in Kenya's EIA process for selected urban projects in Kisumu City to investigate the quality of EIA reports in terms of impact identification and proposed mitigation measures, the 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 of environmental impact identification and 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 of this study reveal that the deficiency in the EIA reports quality is attributed to a number of factors. These factors include, Inadequate baseline data and access to data, inadequate time given for EIA study, attitude of consultants and proponents, the commercial interest of consultants and proponents, a lack of EIA experts, lack of adequate funds, weak TORs, and lack of adequate EIA stakeholders. The results also reveal that time and financial resources are among the main driving forces of EIA Quality. The study concludes that lack of adequate funds is the main factor affecting the quality of EIA reports in Kisumu City. The study recommends that improvements to impact identification in EIA reports will enhance the mitigation measures proposed. It's also clear from the findings that when the impacts are poorly identified, subsequent mitigation measures proposed are also poor. In cases where the EIA reports were graded unsatisfactory in terms of identified impacts, the proposed mitigation measures were equally unsatisfactory as they addressed wrong impacts.

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1.1 Introduction

The quality of EIA reports and implementation of proposed mitigation measures 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 (Okello, 2008; Onyango & Schmidt, 2007; Amombo, 2006; Kamori-Mbote, 2000). In pursuing this theme, the objective of the study was to evaluate the quality of EIA reports in terms of impact identification and proposed mitigation measures in Kisumu city. According to UNISDR (2011) a recent survey of Disaster Risk Reduction in Kisumu City depicted a challenge on the County Government of

Kisumu in maintaining basic infrastructure such as storm drains, the disrepair of which leads to frequent flooding, and recurrent episodes of building collapses.

Disaster risk has two perspectives; behavioural paradigm – natural hazards are caused by human behaviour, and development paradigm – is economic dependent with social and political marginalisation hence increasing human vulnerability and natural disasters (Smith, 2013). Many scholars have treated the development paradigm as the mainstream view of understanding disaster risks (UNISDR, 2005). This research adopts the development paradigm interpretation in defining disaster risk. Disasters today are viewed "...as a result of the complex interaction between a potentially damaging physical event (floods, drought, fire, earthquake and storms) and the vulnerability of a society, its

infrastructure, economy and environment, which are determined by human behaviour” (UNISDR, 2005).

Land use planning is ineffective and disaster reduction planning non-existent. County governments have no budgets to dedicate to reduce risks and have little influence over environmental degradation in surrounding areas that increase risks in these towns (UNISDR, 2011). UNISDR report (*ibid*) indicates inadequacy in: institutional and administrative framework; financing and resources; multi hazard risk assessment; infrastructure protection, upgrading and resilience; protect vital facilities-education and health facilities; building regulations and urban planning; training education and public awareness; environmental protection and strengthening of ecosystems; effective preparedness, early warning and response; and recovering and rebuilding communities. EIA reports are fundamental indicators of an effective EIA system because the information presented in the reports reflect the technical and scientific quality of the EIA process.

1.2 Problem Statement

In Kenya, the role of EIA in protecting the environment from social and environmental impacts of urban development projects is not well documented. The quality of EIA in terms of impact identification and proposing mitigation measures has been well evaluated in most of the reports. What is not fully understood is the quality of EIA reports in terms of impact identification and evaluation. To understand the effectiveness of the EIA in Kenya holistically, according to Morrison-Saunders & Arts, (2012), a thorough understanding of the EIA process, including institutional arrangements, implementation of methodological requirements and environmental mitigation measures are necessary. Urbanisation is prominent in Kenya and the population of Kisumu is growing fast, with a pace of 4% per year. Kenya has witnessed rapid rate of urbanization (annual rate of change %) reported at 4.2834% (World Bank, 2015). The high speed of urbanisation gives rise to many informal settlements and often large, unplanned slum areas lacking access to relevant infrastructure, deficient solid waste management and pollutions (UN-Habitat, 2015a). According to this view, a comprehensive study of the EIA 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 regarding the quality of EIAs and thus provides recommendations to modify and improve EIA to achieve sustainable development. Therefore, there is need for quality EIAs to be produced in order to enable environmental managers to protect and conserve the environment sustainably. The study objective was the evaluation of the quality of EIA Reports in terms of impact identification and proposed mitigation measures. The question for the study was; what is the quality of EIA reports as per the impact identification and proposed mitigation measures?

1.3 Justification of the Study

This study was motivated on a premise to know the extent to which EIAs are performing in terms of mitigating the impacts of development activities, specifically urban development, on the environment. This is critically important in Kenya, because of the increase in urban development activities in the recent years.

The results produced by the study should contribute to the debate on the effectiveness of EIAs to sustainable development.

1.4 Significance to the Study

The study represents important contributions towards environmental consultants, National Environment Management Authority and project proponents on identification of projects environmental implication and possible mitigative measures.

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 (KNBS, 2013).

2.0 Research Methodology

The study was conducted in Kisumu City, the third largest city 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). The study utilized two research designs: A cross-sectional design and descriptive design. Sampling strategy used were: Purposive sampling- for EIA Key stakeholders with clear understanding of EIA processes; stratified random sampling to categorise EIA key stakeholders into independent subgroups including EIA experts, EIA regulators, public involved in EIA and project proponents. 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) Environmental Impact Statement (EIS quality review package and Mitchell's (1997) 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 impact identification and 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.

Urbanisation is prominent in Kenya and the population of Kisumu is growing fast, with a pace of 4% per year (Nodalise Conseil, 2013). The population is expected to reach approximately 722,000 by year 2030 and one million by 2050. The area around Kisumu and along the north shores of Lake Victoria is one of three places identified as the fastest growing urban areas of Africa, and the population density in these areas is expected to become extremely high. More than half of the urban population in Kisumu live in slum areas and informal settlements. Slums are defined as households characterized by lack of at least one of five basic services such as potable water, hygienic sanitation facilities, sufficient living area (not more than three persons per room), structural quality and durability of dwelling and security of tenure (UN-Habitat, 2006).

3.0 Results and Discussion

3.1 Results

The quality of EIA reports reflects the efficiency and effectiveness of EIA process in practice.

3.1.1 Selected EIA reports per sector

30 EIA reports were sampled and categorized by sector as shown in Figure 4.1.

The analysis of the selected EIA reports in Kisumu per sector shows that EIA reports for infrastructure and the Energy

sector constituted 41% each of the total selected projects. Whilst the industrial sector EIA reports comprised of 18% of the selected EIA reports. The thematic areas of the study were; Development of Residential Maisonettes (Hippo Park Village HPV), Rehabilitation of Kisumu Waste Treatment Plant (KWTP) and Kisumu Northern By-pass roads (KNBP). Controlling new development interventions is considered a crucial process within the development-planning paradigm to mitigate potentially negative consequences of development policies, programmes and projects. Assessing potential risks of development initiatives, whether they are for residential, commercial or infrastructural purposes, and taking necessary measures to mitigate those risks can significantly improve the outcomes of such development projects for present and future generations (Barry, 2009).

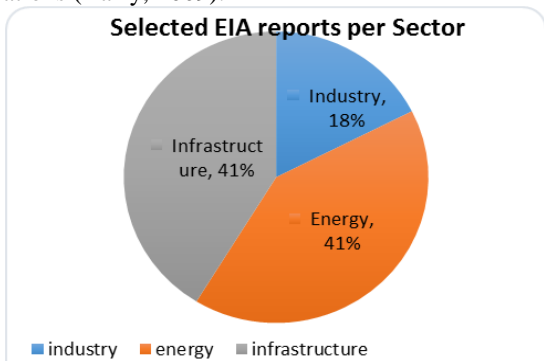


Figure 3.1. Selected EIA reports per Sector
Source: Researcher, 2017.

3.1.2 Quality of EIA by Review Areas

In analyzing the review categories and sub-categories the cumulative scores of the review areas and the overall EIA's was determined in depth. The EIA reports that were reviewed were summarised in score categories and percentage satisfactory for grades A-C (Table 3.1).

The review area category evaluates how the EIA reports addressed the consideration of alternatives and mitigation measures.

In analyzing the scores of the four review areas, leading to the overall score of the EIA, it is evident in Figure 4.2 that review area 3 (alternative and commitment to mitigation) had the lowest satisfactory scores, with 37% of the scores

between A and C. The second lowest percentage of A-C was in review area 2 (identification and evaluation of key impacts). Review area 1 (description of the development) and review area 4 (communication of results) scored 60% and 57% satisfactory scores respectively.

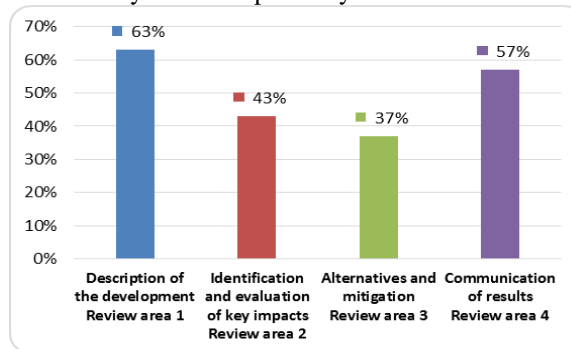


Figure 3.2. Overall percentage scores for A-C (satisfactory scores) of each of the four review areas.

Source: Researcher, 2017 (n=30)

3.1.3 Impact identification and evaluation of Key impacts on EIA processes

The study sought to code the impact identification and the proposed mitigation measures that would assist the proponent and environmental key stakeholders for future planning and environmental management. In analysing identification and evaluation of key impacts on EIA's processes was determined in depth (Figure 3.3).

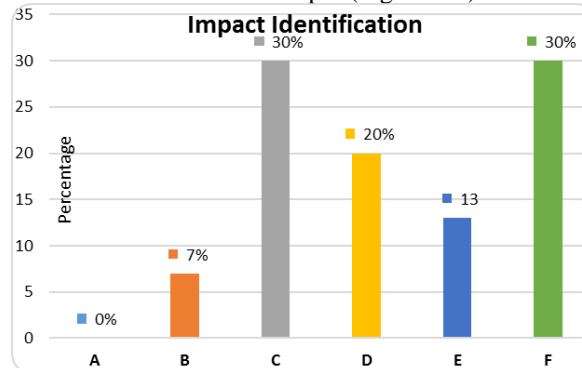


Figure 3.3. Results of Review Area 2 (Source: Researcher, 2017).

Table 3.1. Summary of Review category scores for all reviewed EIA reports and the % satisfactory.

Grades	Review Area 1	A	B	C	D	E	F	%A-C satisfactory
1.1	Description of the Development	2	6	10	6	4	2	60
1.2	Site Description	1	8	11	3	4	3	50
1.3	Residual/Waste matter	1	8	15	2	3	2	60
1.4	Environment Description	1	11	10	2	7	2	47
1.5	Baseline Conditions	1	7	10	3	6	5	50
Review Area 2								
2.1	Identification of impacts	0	2	10	4	5	9	40
2.2	Analysis of impact severity	0	1	8	5	6	10	30
2.3	Assessment of impact significance	0	2	8	6	4	10	33
Review Area 3								
3.1	Alternatives	0	2	9	4	5	10	37
3.2	Scope and effectiveness of mitigation measures	0	3	8	4	7	5	37
3.3	Proponent commitment in implementation of mitigation measures	0	4	6	8	4	8	33
Review Area 4								
4.1	Public involvement	0	4	10	6	4	5	47
4.2	Layout (Information)	3	5	15	4	3	3	77
4.3	Presentation (Information)	5	5	10	5	1	4	67
4.4	Emphasis(Impacts)	1	6	10	6	2	4	60
4.5	Non -technical summary	2	4	6	4	2	12	40
	Average							48

n=30

Keys to grades: A Well performed, B -Generally satisfactory, C -Just satisfactory, D -. Unsatisfactory, E -Poor attempt, F Did not attempt. N Not applicable, % Satisfactory (A-C). %

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In terms of impact identification and evaluation, 37% (11) of the 30 reviewed EIA reports were graded as satisfactory (A-C). Figure 4.3 shows that 7% (2) were graded B or better while 30% (9) were graded C. 33% (10) of the EIA reports were graded as unsatisfactory in terms of impact identification and evaluation of key impacts. The quality of selected EIA reports for urban projects in Kisumu City in general was classified as being satisfactory 11 (37%). The unique combination of impact identification and proposed mitigation measures provided an interesting context within which to explore the relationship between the identified impacts and mitigation measures proposed to address the identified impacts. The reviewed EIA reports revealed that the identified impacts could influence some proposed mitigation measures. The effectiveness of the EIA system depends entirely on the quality of the EIA report. Wende (2002) opines that the quality of EIS as the vital element of EIA practice mirrors the effective identification and evaluation EIA methodologies and procedural requirements in practice. An EIS as the product of the EIA process contains information on how the key stages of an EIA are addressed in practice.

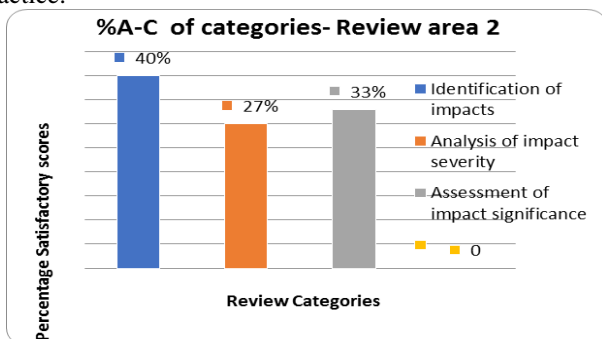


Figure 3.4. Results of the Review categories of Review Area 2(Researcher, 2017).

In depth analysis of the categories in Figure 4.4 reveal that the majority of the categories in terms impact identification and evaluation show that the satisfactory percentage (A-C) for identification of impacts (2.1) was 40%, 30% for analysis of impacts severity (2.2) and 33% for assessment of impact significance (2.3). It's clear that Identification of impacts (2.1) performed the best within this review category. However, 30% for analysis of impacts severity (2.2) achieved the lowest score. Particular problem areas were related to the likely impacts of the development that were not analysed and described in precise terms as possible.

3.1.4 Quality of EISs in terms of proposed mitigation measures

The categories under review area 3 include description of alternatives, effectiveness of mitigation measures and commitment of proponents to implementation of mitigation measures. The results showed that 37% scored satisfactory while 30% were graded as unsatisfactory.

The results revealed that most of the EIA reports reviewed in this review area were below average with an overall score of 37% satisfactory (A-C). In terms of review categories (Figure 4.5), both descriptions of feasible alternatives (3.1) and the effectiveness of mitigation measures scored 37% satisfactory score (A-C). However, EIA reports assessed for proponent commitment in the implementation of

mitigation measures revealed satisfactory scores (A-C) of 33%. The inadequacies and omissions were related to the proponent commitment in implementation of mitigation measures (3.1.3). Although mitigation measures were identified, the phases when the mitigation measures should be implemented were not discussed. The indication of for proponent commitment in implementation of mitigation measures was not clearly outlined, making this the weakest performing Review Area.

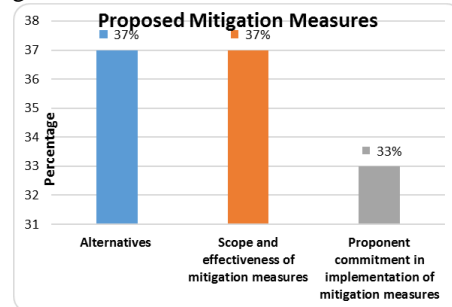


Figure 3.5. Results of the Review categories of Review Area 3(Researcher, 2017).

3.2 Discussions

These findings broadly concur with previous studies conducted in developing countries. Barker & Wood (1999) found 50% of the reviewed EIA reports to be just satisfactory and Badr, Cashmore and Cobb (2004) found 32% of the reviewed EIA reports to be just satisfactory. The study findings are at 37% which is between the ranges. This study connects baseline survey, impact prediction and assessment, the design of mitigation measures, and alternative analysis and monitoring to influence poor performance in EIA processes (Sadler, 1996; Sandham & Pretorius, 2008). The implication of this weakness is that there is the potential risk of poor decision-making in the planning and approval of the project.

The findings of this study also reveal that the deficiency in the EIA reports quality is attributed to a number of factors. These factors include, Inadequate baseline data and access to data, inadequate time given for EIA study, Attitude of consultants and proponents, the commercial interest of consultants and proponents, a lack of EIA experts, lack of adequate funds, weak TORs, and lack of adequate EIA stakeholders (Simpson, 2001; Wood, 2003). Morrison-Saunders, Annandale & Cappelluti (2001), reveal that time and financial resources are among the main driving forces of EIA Quality. Modak and Biswas (1999), are of the view that a clear and complete TOR is an important factor in a good quality EIA report. Peterson's (2009) also argues that since EIA consultants are hired and paid by the developer, subjectivity in forecasting the adverse impacts caused by the proponent cannot be ruled out.

4.0 Conclusion and Recommendations

4.1 Conclusion

The study revealed that the quality of EISs is 'just satisfactory' and thus interventions are required to improve their quality. The findings show the major weaknesses are poor baseline data, poor prediction of impacts and assessment of significant impacts, analysis of alternatives, and the poor design of mitigation measures. Factors influencing the quality of EIA reports include inadequate baseline data and access to data, attitude of consultants and proponents, lack of EIA experts, lack of adequate funds, inadequacy of EIA stakeholders, weak terms of reference (TOR) and shortage of study time.

4.2 Recommendation

The study recommends that improvements to impact identification in EIA reports will enhance the mitigation measures proposed. Training and education program should be initiated by NEMA to develop awareness among the proponents and other EIA stakeholders. Furthermore, it is necessary for NEMA to show initiative in establishing an up-to-date environmental database as the source of baseline data and to make the information accessible to all EIA practitioners. In order to control the bias of EIA consultants in the preparation of EIA reports, ethical codes of conduct should be initiated by the government. The introduction of an accreditation system to maintain the quality of EIA consultants may also improve the quality of EIA reports.

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