REVIEW ARTICLE

A quality review of EIA: A comparative study of state-funded and International Aid Agency-funded development projects in Sri Lanka

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Highlights

- International Aid Agency (IAA) involved EIAs have an impact on improving the quality of EIA.
- In comparison to state funded EIAs, all four review areas of the IAA-EIAs performed notably well.
- IAA-EIAs show values that range from highly satisfactory to satisfactory and each share 50 %, whereas SL-EIAs indicate 83 % satisfactory and 17 % of borderline quality.
- Adhering to IAA standards could elevate the standards of EIA reports.

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A quality review of EIA: A comparative study of state-funded and International Aid Agency-funded development projects in Sri Lanka

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Abstract: Environmental Impact Assessment (EIA) is a tool for mitigating the effects of developmental projects on the environment and promoting sustainable development. EIA is an expensive, and professionally engaged process that involves the public. Many countries around the world have long-standing laws in place connected to this topic, as well as solid knowledge and experience. One persistent argument against the efficacy of EIA in developing nations is that the procedure and quality differ from country to country. The International Aid Agencies (IAA) have their guidelines for protecting the environment while following local environmental assessment standards for any financing requirements. IAA involvement in the EIA process might significantly affect how well-written EIA reports are. To evaluate the assessment quality, six EIA reports from state-financed development projects (SL-EIAs) and another six development projects EIAs funded by the IAA (IAA-EIAs) in Sri Lanka were randomly chosen. LeeCooley review package (1990) was used to evaluate the Environmental Impact Statements (EIS) of each EIA. In this investigation, it was discovered that IAA-EIAs and SL-EIAs had a significant difference in overall quality. IAA-EIAs show values that range from highly satisfactory to satisfactory and each share 50 percent, whereas SL-EIAs indicate 83% satisfactory and 17 % of borderline quality. In comparison to the SL-EIAs, all four review areas of the IAA-EIAs performed notably well. While the SL-EIA shows good to borderline quality (0.66-0.72), all evaluated IAA-EIA reports reveal highly satisfactory to satisfactory (0.81-0.93) quality. The engagement of IAA in the environmental assessment has a considerable impact to improve assessment quality in comparison to the only domestic assessment. Finding the weak area in the SL-EIA process and adhering to the IAA standards would elevate the standard of the report.

Keywords: EIA quality; International Aid Agency; Sri Lanka; development projects.

INTRODUCTION

Through its capacity to facilitate environmentally responsible and sustainable development, Environmental Impact Assessment (EIA) has a significant role to play in addressing environmental issues (Suwanteep *et al.*, 2016). Early in the 1980s, East and Southeast Asia adopted the EIA methodology. Many experts in both developed and developing nations have evaluated their EIA procedures and are working to make their systems more effective (Kabir & Momtaz, 2012). Currently, Asian countries must also engage with the requirement to enhance the efficiency and execution of their EIA systems (Kamijo & Huang, 2016). However, Nykvist *et al*., say that "there are arguments that the gap between high expectations and poor empirical performance is still significant" (Nykvist & Nilsson, 2009).

The significance of integrating EIA procedures into development planning has been recognized by developing nations in Asia. Biswas *et al*., states that "the EIA implementation in Asia faces severe limitations, however, including insufficient procedural guidance, inadequate baseline data, the cost of EIA study, potential delays, the lack of expertise, inefficient communication of EIA results to decision-makers lack of inter-agency coordination, limited capacity for review of EIA reports, insufficient commitment to follow up on the implementation of environmental protection and monitoring requirements" (Biswas & Qu Geping, 1987). The World Bank (WB) reviled that the project design did not yet sufficiently reflect EIA (Scholten & Post, 1999) . Before being submitted to the EIA review body for formal evaluation, the EIA should undergo internal review. To ensure that the environmental evaluation is complete and that all tasks specified in the TOR have been satisfactorily completed. this criticism should be conducted. Kodithuwakku (2004) states that the purpose of the critique is to ensure the final EIA reports sent to governmental agencies and other funding agencies for review and approval are complete, and present as accurate a picture as possible of the likely environmental effects of the project.

EIA was initially implemented in Sri Lanka in 1981 for coast conservation. The National Environment Act (NEA) of Sri Lanka was in place by the year 1980, and changes made to the Act in 1988 mandated EIA island-wide (NEA 1988). The organization in charge of carrying out the NEA's requirement is known as the Central Environmental Authority (CEA). The CEA has created numerous rules that are extensively used in its efforts to strengthen the EIA process and sustainable development (Wijesekera & Weerakkody, 2006).

Since the 1970s, all parties involved in development

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assistance project-donors and recipients have been aware of the necessity of considering environmental issues in their aid initiatives. (Biswas & Qu Geping, 1987) (Sammy & Canter, 1983). EIA, also known as environmental assessment (EA), has increasingly been the primary method of attempting to achieve this (Biswas & Qu Geping, 1987).

Donor organisations first implemented EIA on a voluntary and informal basis, but it has increasingly become a part of their formal process and, in some cases, is now a legal obligation (The Organization for Economic Cooperation and Development, 2004). As a result, the majority of multilateral and bilateral aid organizations as well as development banks have created their environmental assessment guidelines, which outline the methodology and / or procedures they will use for their assessments. This document contains an annotated compilation of approximately 200 guidelines on EIA and related subjects created by aid organizations and development banks (Biswas & Qu Geping, 1987). For instance, in 1989, the WB decided that major projects should ordinarily have an EIA carried out by the borrowing government under Banks's supervision, similar procedure has been followed by Asian Development Bank (ADB) and Japanese International Corporation Agency (JICA)(Sammy & Canter, 1983),.

Context of donor agency EA

EIA is a method for considering potentially important environmental effects throughout the design, approval, and execution of new development projects. It should be integrated within the project cycle, passing through several different stages (such as screening, scoping, impact prediction, preparation of EIA documentation, consultation, and public participation, determination of mitigation measures, financial approval, project authorization, and monitoring of project implementation) and involving several organizations on (such as donor agencies, various developing country ministries, developer enterprises, consultancies, environmental authorities, and NGOs) (Brew *et al.,* 2012).

Most projects funded by loans from International Aid Agencies (IAA) must undergo an EA. All IAAs operate on the principle that responsibility for the preparation and review of the EIA rests with the recipient country. In some cases, however, the IAAs will provide technical assistance for the EIA based on the recipient countries' EA regulations. Such help may include screening the project; conducting the IEE; preparing the TOR; retaining a consultant to conduct the EIA studies and prepare the EIA report; reviewing the EIA report; and, attaching terms and conditions, and the approval.

In other instances, the IAA will carry out the EIA outside of the beneficiary country, but only if it complies with its standards. The IAA then examines over the EIA report, agrees or denies the funding request, and if approved, adds terms and conditions (Brew *et al.*, 2012). The IAA may perform a post-project evaluation once the project completed. Generally speaking, the IAAs tend to have stricter requirements for EIA than do many developing countries. The EIA standards set by the IAA are frequently helpful benchmarks for developing countries' improving EIA procedure. Finding a balance the IAA's requirements and those of the developing country is a crucial component of the EIA team's work (Biswas & Qu Geping, 1987).

However, the EIA guideline to be adopted in addition to the developing country has a significant impact on the process, in this context the major objective of this research is to find the quality variation of EIA reports prepared by Sri Lankan state agencies alone (not funded by IAA) and IAA funded projects EIA by using an EIA quality review package called Lee-Cooley review package (1990). The Lee-Cooley review package is widely used to assess the quality of EIA reports globally, either directly or with modified review packages, over the past few decades (Kamijo & Huang, 2016; Lee & Tomkins, 1993; Badr *et al*., 2011; Gray, 1999; Kabir *et al*., 2010; McMahon, 1996).

MATERIALS AND METHODS

In this study totally of twelve (12) EIAs were randomly selected among these six (6) EIARs were prepared by State Agencies (SL-EIA) whereas the other six (6) with the funding involvement of International Aid Agencies (IAA-EIA) among every two reports were selected from WB, ADB, and JICA. The broad development sector of this selected EIA from Energy (3), Irrigation (2), Transport (5), Solid waste (1), and Marine (1). The reports were prepared between 2015 and 2021, relevant EIA reports were collected from the project's official websites and IAA websites.

The updated LEE and Colley Environmental Statement Review Package was used to evaluate the EIA's quality (Lee *et al.*, 1999) (Davis *et al*., 2006). Based on a hierarchy of so-called review themes, the review process entails assigning assessment grades, from A to F, according to quality, to various aspects of an EIA (see Table 1). Additionally, information about the EIA's length and release date was gathered. With this approach, the quality evaluation entails assessing how well a number of tasks that are specified and organized hierarchically into subcategories are carried out. The review areas and review categories, and the assessment symbols are summarized in Tables 1 and 2, respectively. It is recommended review by two researchers separately and then reconciles any differences in the grades assigned before agreeing upon a final overall grade (Lee *et al*., 1999). However, in this study, three researchers were involved where and the principal researcher is an environmental professional with others who have a reasonable background in EIA.

In this study, the environmental impacts were interpreted to include mention of social consequences because the JICA ESC criteria encompass social implications in addition to environmental impacts although the Lee-Colle review package does not. The Extended cost-benefit analysis section is not considered in this package so it has not been focused on the review area.

The review values supplied to each attribute are normalized for comparative evaluation of the EIAs by converting them to a Likert scale of 1.0, 0.8, 0.6, 0.4, 0.2, and 0. It was believed that all traits would be equally weighted.

Table 1: Assessment symbols.

Symbol	Explanation
A	Relevant tasks well performed, no important tasks left incomplete.
B	Generally satisfactory and complete, only minor omissions and inadequacies.
C	Can be considered just satisfactory despite omissions and/or inadequacies.
D	Parts are well attempted but must, as a whole, be considered just unsatisfactory because of omissions or inadequacies.
E	Not satisfactory, important task(s) poorly done or not attempted.
F	Very unsatisfactory, important task(s) poorly done or not attempted.
NA	Not applicable. The Review Topic is not applicable or is irrelevant in the context of the statement.

Source: Lee *et al.*, 1999

Table 2: Review areas and review categories.

1	**Description of the development, the local environment, and the baseline conditions**
1.1	Description of the development
1.2	Site description
1.3	Wastes
1.4	Environment description
1.5	Baseline conditions
2	Identification and evaluation of key impacts
2.1	Definition of impacts
2.2	Identification of impacts
2.3	Scoping
2.4	Prediction of impact magnitude
2.5	Assessment of impacts significance
3	**Alternatives and mitigation**
3.1	Alternatives
3.2	Scope and effectiveness of mitigation measures
3.3	Commitment to mitigation
4	**Communication of results**
4.1	Layout
4.2	Presentation
4.3	Emphasis
4.4	Non-technical summary

Integrating mathematical measurements enable a thorough comparison of the various EIA indicator values from all twelve projects. The final score is then calculated by averaging the scores assigned during the review process using the following calculation:

$$Fs = \Sigma\, IS/TC \qquad \text{Equation (1)}$$

Fs – Final score, IS- Individual Score, TC- Total Score

A set of evaluative criteria to be used in each EIS assessment, recommendations for reviewers, and a collation sheet to record the results from the criteria checklist are just a few of the elements that make up the Lee and Colley (1990) EIS Quality Review Package. Starting with the simplest criteria, the criteria are placed in a hierarchical (pyramid) form with four levels of assessment. A list of revies subjects includes the evaluation criteria, including the review area, review categories, review subcategories, and overall quality assessment. The Extended Cost Benefit Analysis components, however, were not included in this EIS assessment since the standards for evaluating them were unclear and some EIAs did not contain this element. Three basic categories were used to categorize the overall performance of the EIA: highly satisfactory (A), satisfactory (B), borderline (C), and unsatisfactory (D or E or F).

RESULTS AND DISCUSSION

Overall Quality of EIA

A distinct difference between SL-EIAs and IAA-EIAs can be seen when comparing the overall quality of the 12 EIAs created for various developments in Sri Lanka between 2013 and 2021 for EIA-type interventions. According to the findings, all IAA-EIAs are of good quality (50 percent of A and 50 percent of B), while 83 percent of SL-EIAs are of good quality (B) and 17 percent are of borderline (C) quality, with no reports receiving the lowest grade (D, E & F). Table 3 provides an overview of the general calibre of EIAs. IAA-EIAs performed well across all four review areas, with review area 4 having the highest in SL-EIA performance.

Table 3: Overall assessment

Overall Assessment quality	SL-EIAs	IDA-EIAs
A	0	3 (50%)
B	5 (83%)	3 (50%)
C	1 (17%)	0
D	0	0
E	0	0
F	0	0

Additionally, Table 4 provides a summary of the findings from a comparative evaluation of the quality of EIA. The table lists the results for each attribute based on a comparison to the Lee and Cooley (1990) EIS quality review package. Equation 1 was used to normalize and average the results of the revisions. Each attribute's outcome was scaled to a 6-point scale with a range of 0.00 to 1.00. A final score of 0.40 denotes an unacceptable (US) EIA quality, while a score between 0.40 and 0.60 denotes a borderline EIA quality (BL). Between a final score of >0.60 and 0.8, an EIA's quality is considered good (S), and above 0.8, it is considered extremely satisfactory (HS). The visual representation of both category EIAs attributes is shown in Figures 1 and 2.

Based on the investigation, the findings showed that the SL-EIAs had an overall quality between 0.66 and 0.72 while the IAA-EIAs were between 0.81 and 0.93. It distinguishes between the two types of EIAs' qualitative differences with clarity. It's interesting to note that the average score for review areas 1 and 2 (Description of the development & Identification and Evaluation of Key Impacts) of IAA-EIAs is 0.86 (Highly Satisfactory), whereas the SL-EIAs score for those same review areas is 0.63 (Satisfactory) and 0.6 (Borderline) respectively. Similarly, the average score of review is 3, and review area 4 (Alternatives and mitigation and Communication of results) of IAA-EIAs scores a little below than review area 1&2 of 0.83 (Highly satisfactory) but for the same review areas, SL-EIAs score 0.73 (Satisfactory) and 0.8 (Satisfactory) respectively. In general, the all for review area of IAA-EIA show similar performance whereas the SL-EIA is strong in review area 3&4 compared to review area 1&2 itself. Visual comparisons are given in figures 1&2.

The average scores received by all assessed EIARs are illustrated in below Table 5.

Review area 1; Description of the development, the local environment, and the baseline conditions

Comparatively, Review area 1 of four SL-EIAs have satisfactory quality while the other two are of borderline quality, however, the IAA-EIAs were in good quality with high- level score except for one EIA (0.76). Considering the review category, the baseline condition description of IAA-EIAs are in very good level scores above 0.8. However, the waste category (the amount of waste generated by the development activity and the disposal techniques were scored) is a weaker part of all EIAs assessed, here SL-EIA scores 0.2 (unsatisfactory) to 0.6 (borderline) whereas the IAA-EIA scores between 0.6 to 0.8 (borderline to satisfactory). The unsatisfactory score is due to the lack of accountability for waste generation and handling method proposals. Table 6 illustrates the obtained grade of review area 1 with its sub category.

Table 4: Result of the comparative EIA quality analysis of SL-EIAs and IAA-EIAs.

	SL-EIAs						IAA-EIAs					
Review Area & Review Category	**R1**	**R2**	**R3**	**R4**	**R5**	**R6**	**R1**	**R2**	**R3**	**R4**	**R5**	**R6**
Description of the development, the local environment, and the baseline conditions	**0.68**	**0.68**	**0.60**	**0.60**	**0.68**	**0.72**	**0.76**	**0.84**	**0.88**	**0.96**	**0.92**	**0.80**
Description of the development	0.80	0.60	0.80	0.80	0.60	0.80	0.80	0.80	0.80	1.00	1.00	0.80
Site description	0.60	0.80	0.60	0.60	0.60	0.80	0.80	1.00	0.80	1.00	0.80	0.80
Wastes	0.60	0.60	0.40	0.20	0.60	0.60	0.60	0.80	0.80	0.80	0.80	0.60
Environment description	0.80	0.80	0.60	0.60	0.80	0.80	0.80	0.60	1.00	1.00	1.00	1.00
Baseline conditions	0.60	0.60	0.60	0.80	0.80	0.60	0.80	1.00	1.00	1.00	1.00	0.80
Identification and evaluation of key impacts	**0.68**	**0.60**	**0.64**	**0.68**	**0.64**	**0.60**	**0.84**	**0.84**	**0.88**	**1.00**	**0.96**	**0.84**
Definition of impacts	0.60	0.60	0.60	0.60	0.60	0.60	0.80	1.00	0.80	1.00	1.00	0.80
Identification of impacts	0.80	0.40	0.80	0.80	0.80	0.60	0.80	0.60	1.00	1.00	1.00	1.00
Scoping	0.60	0.80	0.60	0.60	0.60	0.60	1.00	1.00	1.00	1.00	1.00	0.80
Prediction of impact magnitude	0.60	0.60	0.60	0.60	0.60	0.60	0.80	0.80	0.80	1.00	0.80	0.80
Assessment of impacts significance	0.80	0.60	0.60	0.80	0.60	0.60	0.80	0.80	0.80	1.00	1.00	0.80
Alternatives and mitigation	**0.73**	**0.73**	**0.73**	**0.80**	**0.60**	**0.67**	**0.80**	**0.93**	**0.87**	**0.87**	**0.80**	**0.87**
Alternatives	0.80	0.80	0.80	0.80	0.60	0.60	0.80	1.00	1.00	1.00	0.80	0.80
Scope and effectiveness of mitigation measures	0.60	0.80	0.60	0.80	0.60	0.60	0.80	0.80	0.80	0.80	0.80	0.80
Commitment to mitigation	0.80	0.60	0.80	0.80	0.60	0.80	0.80	1.00	0.80	0.80	0.80	1.00
Communication of results	**0.80**	**0.75**	**0.70**	**0.80**	**0.70**	**0.75**	**0.85**	**0.95**	**0.85**	**0.90**	**0.85**	**0.80**
Layout	0.80	0.80	0.80	0.80	0.60	0.80	0.80	1.00	1.00	0.80	0.80	0.80
Presentation	0.80	0.80	0.80	0.80	0.80	0.80	1.00	1.00	0.80	1.00	1.00	0.80
Emphasis	0.80	0.60	0.60	0.80	0.80	0.80	0.80	0.80	0.80	1.00	0.80	0.80
Non-technical summary	0.80	0.80	0.60	0.80	0.60	0.60	0.80	1.00	0.80	0.80	0.80	0.80
Final Score	**0.72**	**0.69**	**0.67**	**0.72**	**0.66**	**0.68**	**0.81**	**0.89**	**0.87**	**0.93**	**0.88**	**0.83**

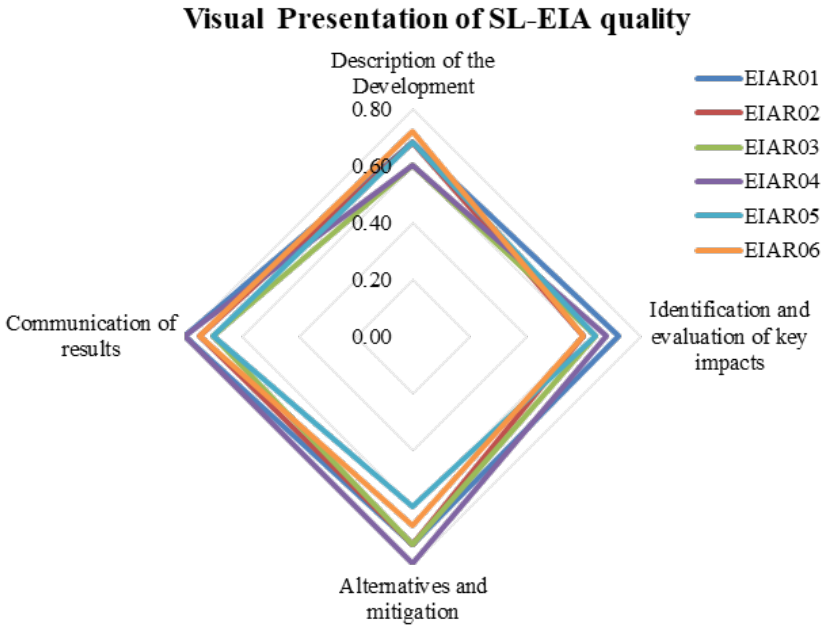

Figure 1: Visual presentation of the SL-EIA quality.

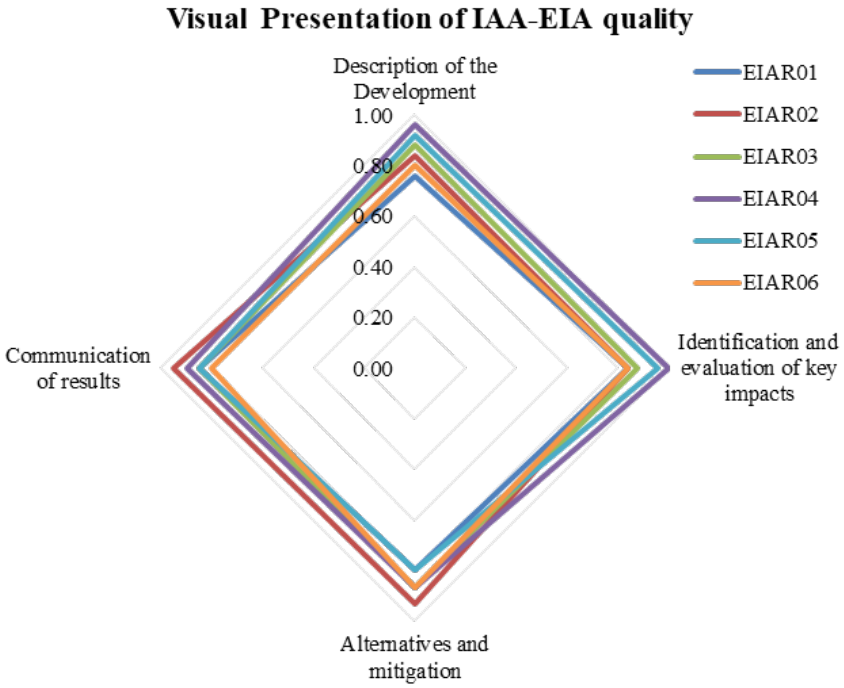

Figure 2: Visual presentation of the IAA-EIA quality.

Table 7 illustrates the variation of EIA quality of review area 1, where most of the sub-category fall between satisfactory to borderline quality 40% and 53% respectively, however, 7% falls under the unsatisfactory quality of SL-EIAs. Despite a 10% borderline quality observed in another sub-area of IAA-EIAs scores highly satisfactory and satisfactory levels of 40% and 50% respectively. Overall, 90% of IAA-EIAs are above borderline quality whereas only 40% of SL-EIAs are above borderline quality.

Review area 2: Identification and evaluation of key impacts

Review area 2 shows a significant difference for both types, SL-EIAs scores 0.6 to 0.8 (borderline to satisfactory) but the IAA-EIAs score 0.84 to 1.00 (highly satisfactory). However, identification of the impact of one SL-EIA scores 0.4 (unsatisfactory), this is due to the poor definition of impact, identifying the effect, design operation condition, impact determination with baseline condition, etc. Notably, one IAA-EIA scores 1.0 (highly satisfactory) in this review area. Table 8 illustrates the obtained grades of each sub-category under review area 2.

Table 9 illustrates the variation of EIA quality of review area 1, only 13% of SL-EIAs scores satisfactory range,

and majority show in borderline quality which is 73%, notably 3% of unsatisfactory also observed in this review category which is due to the lower performance of review sub-category 2.2 (Identification of impacts). However, in respect to review area 2 of IAA-EIAs scored highly satisfactory and satisfactory which accounted for 53% and 47% respectively, the highest performance observed in the sub category of 2.2 & 2.3 (Identification of impacts & Scoping).

Review area 3: Alternatives and mitigation

Review area 3 of SL-EIAs show borderline to satisfactory quality with the range between 0.6 and 0.8, on the other hand, the IAA-EIAs show highly satisfactory with the range between 0.87 and 0.95. Except for two SL-EIAs scored 0.6 (borderline) rest of the four reports score 0.8. Table 10 illustrates the obtained grades of each sub category.

Table 11 indicates the variation of EIA quality of review area 3. SL-EIAs score between satisfactory and borderline at 56% and 44% respectively, whereas IAA-EIAs score between highly satisfactory and satisfactory at 28% and 72% respectively.

Review area 4: Communication of results

Concerning the review area 4 presented in table 12. The SL-EIAs overall quality is satisfactory in the range with a score between 0.7 to 0.8. On the other hand, the IAA-EIAs overall quality is 0.8 to 0.95. However, 50% of sub-review area of 4.4 scores borderline quality in SL-EIAs. Notably, the overall quality of review area 4 of SL-EIAs are show satisfactory. Compared to the other three review area the highest performance of SL-EIAs was observed in this review area.

Table 13 presents the variation of EIA quality of review area 4. Only 17% of borderline quality was observed in SL-EIAs others cumulatively score satisfactory quality with 83%. For the same review area, IAA-EIAs performed from satisfactory to a highly satisfactory level with 61% and 39% respectively.

Table 5: Review area-wise overall quality.

	SL-EIAs						IAA-EIAs					
Review Topics	**R1**	**R2**	**R3**	**R4**	**R5**	**R6**	**R1**	**R2**	**R3**	**R4**	**R5**	**R6**
1. Description of the development	C	C	C	C	C	B	B	B	B	A	A	B
2. Identification and evaluation of key impacts	C	C	C	C	C	C	B	B	B	A	A	B
3. Alternatives and mitigation	B	B	B	B	C	C	B	A	B	B	B	B
4. Communication of results	B	B	B	B	B	B	B	A	B	B	B	B
Overall quality	B	B	B	B	C	B	B	A	B	A	A	B

Table 6: Obtained scores of review area 1

	SL-EIAs						IAA-EIAs					
Review area 1	**R1**	**R2**	**R3**	**R4**	**R5**	**R6**	**R1**	**R2**	**R3**	**R4**	**R5**	**R6**
1.1 Description of the development	B	C	B	B	C	B	B	B	B	A	A	B
1.2 Site description	C	B	C	C	C	B	B	A	B	A	B	B
1.3 Wastes	C	C	D	E	C	C	C	B	B	B	B	C
1.4 Environment description	B	B	C	C	B	B	B	C	A	A	A	A
1.5 Baseline conditions	C	C	C	B	B	C	B	A	A	A	A	B
The overall quality of review area 1	*C*	*C*	*C*	*C*	*C*	*B*	*B*	*B*	*B*	*A*	*A*	*B*

Table 7: Variation of EIA quality of review area 1

	SL-EIAs				IAA-EIAs			
Review area 1	**% HS**	**% S**	**% BL**	**% US**	**% HS**	**% S**	**% BL**	**% US**
1.1	0%	67%	33%	0%	33%	67%	0%	0%
1.2	0%	33%	67%	0%	33%	67%	0%	0%
1.3	0%	0%	67%	33%	0%	67%	33%	0%
1.4	0%	67%	33%	0%	67%	17%	17%	0%
1.5	0%	33%	67%	0%	67%	33%	0%	0%
% Review area 1	*0%*	*40%*	*53%*	*7%*	*40%*	*50%*	*10%*	*0%*

Table 8: Obtained scores of review area 2.

	SL-EIAs						IAA-EIAs					
Review Area 2	**R1**	**R2**	**R3**	**R4**	**R5**	**R6**	**R1**	**R2**	**R3**	**R4**	**R5**	**R6**
2.1 Definition of impacts	C	C	C	C	C	C	B	A	B	A	A	B
2.2 Identification of impacts	B	D	B	B	B	C	B	C	A	A	A	A
2.3 Scoping	C	B	C	C	C	C	A	A	A	A	A	B
2.4 Prediction of impact magnitude	C	C	C	C	C	C	B	B	B	A	B	B
2.5 Assessment of impacts significance	B	C	C	B	C	C	B	B	B	A	A	B
The overall quality of review area 2	*C*	*C*	*C*	*C*	*C*	*C*	*B*	*B*	*B*	*A*	*A*	*B*

Table 9: Variation of EIA quality of review area 2

	SL-EIAs				IAA-EIAs			
Review area 2	**% HS**	**% S**	**% BL**	**% US**	**% HS**	**% S**	**% BL**	**% US**
2.1	0%	0%	100%	0%	50%	50%	0%	0%
2.2	0%	67%	17%	17%	83%	17%	0%	0%
2.3	0%	17%	83%	0%	83%	17%	0%	0%
2.4	0%	0%	100%	0%	17%	83%	0%	0%
2.5	0%	33%	67%	0%	33%	67%	0%	0%
% Review area 2	*0%*	*23%*	*73%*	*3%*	*53%*	*47%*	*0%*	*0%*

Table 10: Obtained scores of review area 3.

	SL-EIAs						IAA-EIAs					
Review Area 3	**R1**	**R2**	**R3**	**R4**	**R5**	**R6**	**R1**	**R2**	**R3**	**R4**	**R5**	**R6**
3.1 Alternatives	B	B	B	B	C	C	B	A	A	A	B	B
3.2 Scope and effectiveness of mitigation measures	C	B	C	B	C	C	B	B	B	B	B	B
3.3 Commitment to mitigation	B	C	B	B	C	B	B	A	B	B	B	A
The overall quality of review area 3	*B*	*B*	*B*	*B*	*C*	*C*	*B*	*A*	*B*	*B*	*B*	*B*

Table 11: Variation of EIA quality of review area 3.

	SL-EIAs				IAA-EIAs			
Review area 3	**% HS**	**% S**	**% BL**	**% US**	**% HS**	**% S**	**% BL**	**% US**
3.1	0%	67%	33%	0%	50%	50%	0%	0%
3.2	0%	33%	67%	0%	0%	100%	0%	0%
3.3	0%	67%	33%	0%	33%	67%	0%	0%
% of Review area 3	*0%*	*56%*	*44%*	*0%*	*28%*	*72%*	*0%*	*0%*

Table 12: Obtained scores of review area 4.

	SL-EIAs						IAA-EIAs					
Review area 4	**R1**	**R2**	**R3**	**R4**	**R5**	**R6**	**R1**	**R2**	**R3**	**R4**	**R5**	**R6**
4.1 Layout	B	B	B	B	C	B	B	A	A	B	B	B
4.2 Presentation	B	B	B	B	B	B	A	A	B	A	A	B
4.3 0Emphasis	B	C	C	B	B	B	B	B	B	A	B	B
4.4 Non-technical summary	B	B	C	B	C	C	B	A	B	B	B	B
The overall quality of review area 4	*B*	*B*	*B*	*B*	*B*	*B*	*B*	*A*	*B*	*B*	*B*	*B*

Table 13: Variation of EIA quality of review area 4.

	SL-EIAs				IAA-EIAs			
Review area 4	**% HS**	**% S**	**% BL**	**% US**	**% HS**	**% S**	**% BL**	**% US**
4.1	0%	83%	17%	0%	33%	67%	0%	0%
4.2	0%	100%	0%	0%	67%	33%	0%	0%
4.3	0%	67%	33%	0%	17%	83%	0%	0%
4.4	0%	50%	50%	0%	17%	83%	0%	0%
Review area 4	*0%*	*83%*	*17%*	*0%*	*39%*	*61%*	*0%*	*0%*

Report Length and overall quality

According to earlier studies, the duration of an EIAR appears to have an impact on the report's overall quality. This is not meant to imply that length and excellence are mutually exclusive. Instead, it is possible to use the length of an EIAR as a stand-in for resource allocation, which in turn illustrates how seriously project backers take the EIA process. According to the quality scores, there is a significant correlation between the length of an EIAR and its quality in the population that was sampled. The below chart (Figure 3) shows the relationship between a number of pages in EIA reports and their respective overall quality. Despite some deviations, it shows the EIA quality is increasing with the increased number of pages of the report.

Overall, the SL-EIAs range in page count from 149 to 515 (average: 308 pages), with five of them displaying satisfactory quality aside from one with borderline quality (C). The IAA-EIA's report length, on the other hand, ranges from 261 to 574 pages (average: 372), with three EIAs having satisfactory quality and the remaining three having highly satisfactory quality. The length of the report has a considerable impact on the quality of the EIA, it may be said.

CONCLUSION

This analysis of the quality of EIAs demonstrates that IAA- EIAs have better quality than SL-EIAs. According to this analysis, all IAA-EIAs are of satisfactory or highly satisfactory quality, while SL-EIAs have an overall quality rating of 83 percent satisfactory and a borderline quality rating of 17 percent. Although the IAAs' engagement in their projects had certain extra characteristics to improve the quality of EIAs, all of the EIAs that were taken into consideration followed the same approach that was required for development projects in Sri Lanka. For instance, public participation in IAA projects must occur at multiple levels of the assessment cycle as opposed to just once during the public disclosure of papers for SL-EIA, however, it isn't always required for IEE projects. Further, it shows the specific location of SL-EIA identified major weakness, which was discovered throughout all review areas. Some SL-EIA components under review area 1 description of the environment received low marks for the site description, waste management, and baseline conditions, while components under review area 2 identification and evaluation of key impacts received poor marks for impact definition, scoping, and impact magnitude prediction. The assessment of effects significance scored lower value in certain SL-EIAs in review area 3 of alternative identification, and in review area 4 of communication of results, non-technical summaries of some EIAs' performed borderline quality scored lower value. Various government agencies, including the Ministry of Power and Energy, the Sri Lanka Sustainable Energy Authority, the Mahaweli Authority, the Sri Lanka Port Authority, and the Road Development Authority, are also project proponents. The overall quality of SL-EIAs ranges from 0.66 to 0.72. However, only three instances of the borderline score were recorded in IAA-EIAs, two of which involved environmental description and effect identification under review area 2 and one of

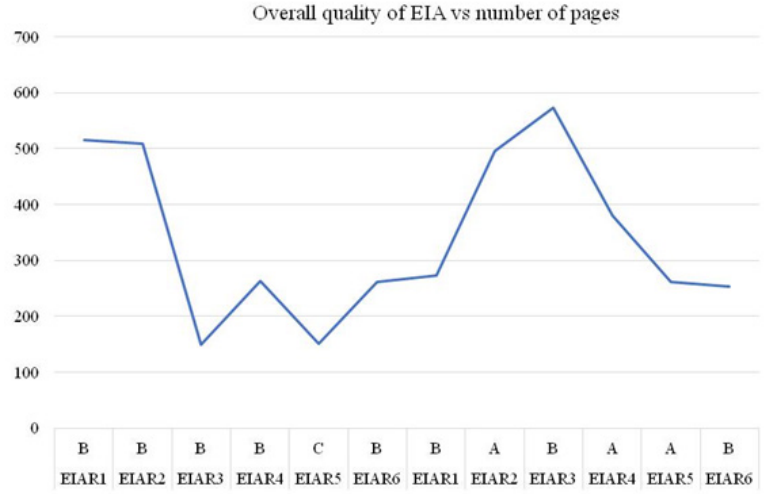

Figure 3: EIA report quality and report length.

which involved waste under review area 1.

The overall quality of each EIA report scored ranging from 0.81 to 0.93 with a less significant quality difference, despite the three different IAAs (JICA, ADB, and WB) projects being evaluated. It states unequivocally that the IAA's participation in the EIA process improves the EIA's quality. Additionally, compared to IAA-EIA, the consultation and participation of stakeholder groups appear to be a particularly troublesome feature of SL-EIA practice. Regardless of the EIA process in Sri Lanka, IAA makes more efforts to hold a public consultation in multiple stages. This gives relevant stakeholders more room to express their opinions on the various stages of the EIA process and to obtain transparent information about proposed project interventions during the planning stage of development projects.

INFERENCES

For policymakers, investors, and stakeholders looking to enhance the standard of environmental assessments, the conclusions have numerous significant implications. Government regulations and advice are critical in improving the quality of EIAs and the sustainability performance of development projects (Kamijo & Huang, 2016). To successfully control the EIA guidelines, it is advised that both the aid agency and home country governments should emphasize institutional limits and ensure enforcement. Project proposers must strengthen their EIAs, collaborate with stakeholders, increase environmental management transparency, and actively support local development. To avoid disagreements between stakeholders and organizations, effective impact assessment, mitigations measures, and an inclusive approach to public decision-making are crucial. The dedication to sustainable development in any nation would be the final enhancement of EIA and its suitable implementation.

The EIA process has been accepted as a cornerstone of the decision-making mechanism in environmental policy and the quality of an EIA is of great importance in informing the public and decision-makers about the consequences of a proposed project and mitigation measures (Aung *et al*., 2019). Therefore, a thorough evaluation of an EIA is essential to giving useful feedback for its improvement. The quality of an EIA from a developing nation must be compared with a predetermined set of international agency standards in light of the vast breadth and rapid expansion of development projects to cross-check its quality and identify any areas that need to be addressed.

DECLARATION OF CONFLICT OF INTEREST

The authors made no mention of any potential conflicts of interest.

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