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Evaluating the quality of environmental impact reporting for proposed tourism-related infrastructure in the protected areas of South Africa: a case study on selected EIA reports

Donna Kim Wylie, Subhadeep Bhattacharjee and Isaac Tebogo Rampedi*
Department of Geography, Environmental Management and Energy Studies
University of Johannesburg, South Africa
isaacr@uj.ac.za

Corresponding Author*

Abstract

Environmental impact assessment (EIA) is an important planning tool to strengthening environmental policy decisions by encouraging the sustainability of development projects that may lead to adverse environmental impacts and large-scale environmental degradation. The South African National Environmental Management Act (NEMA) (Act No. 107 of 1998) and the 2010 EIA Regulations (GNR 543 and 546) provide minimum requirements for environmental assessment that is classified as basic environmental impact assessment, amongst other instruments. In this case study, the quality of Basic Environmental Impact Assessment Reports (BEIARs) compiled for planned tourism-related infrastructure in and around the Protected Areas (PAs) of the Mpumalanga and Limpopo provinces of South Africa was examined. To achieve this goal, the case study adopted a modified Lee and Colley Review Package. The findings of this case study showed that 92% of the BEIARs performed satisfactorily in terms of overall quality while only 54% attained 'exceptionally good' quality meanwhile a high proportion of BEIARs were of borderline quality. Moreover, although the degree of legal compliance was relatively high as compared in other EIA studies in South Africa, the more descriptive assessment tasks were conducted typically well as compared to other tasks that required more analytical capabilities. The case study also pinpointed other areas in need of further improvement and refinement so that planned tourism-related facilities do not cause long-term environmental damage in the protected areas of South Africa.

Keywords: Eco-tourism infrastructure; Environmental Impact Assessment; Lee and Colley Review Package; Protected Areas; South Africa.

Introduction

Since the year 1994 and the dawn of democracy, South Africa has witnessed an accelerated increase in the promulgation of various legislations and regulations, including those enacted for improved environmental protection and sustainability in the management and utilization of natural resources. Moreover, Section 24 of the Constitution of the Republic of South Africa (Act No. 108 of 1996) accords environmental rights to citizens and the prevention of pollution as well as environmental conservation while encouraging what is known as 'justifiable economic and social development'. To realize this goal, the National Environmental Management Act (NEMA) (Act No. 107 of 1998) provides an overarching framework for environmental governance in South Africa in line with a number of provisions and principles, which support sustainable development practices. According to NEMA (Act No. 107 of 1998), the effects of proposed development activities on the environment must receive adequate consideration and assessment for their magnitude and significance before they are

constructed and implemented through a systematic process known as environmental impact assessment (EIA).

However, since the introduction and inception of EIA in the USA in 1970 (Holland, 1985), the quality and effectiveness of EIA reporting has been researched and reviewed in several jurisdiction worldwide (Lee & George, 2000; Ahammed & Nixon, 2006; Macintosh, 2010; Kahangirwe, 2011; Zubair *et al*., 2011; Glasson *et al*., 2012; Panigrahi & Amirapu, 2012; Appiah-Opoku & Hobson, 2013). Once an EIA study has been completed for any proposed infrastructures, the information collected during the environmental process is systematically analyzed, synthesized, and condensed into a document known as an environmental impact assessment report. Such a report provides regulatory authorities as well as interested and affected stakeholders with the scientific basis for deciding on the environmental feasibility of the proposal.

A high quality EIA report will convey relevant environmental information about the proposed project based on well-defined assumptions, regulatory and legislative compliance, and robust impact analyses and their significance, while suggesting effective mitigation plans (Glasson *et al*., 2012). Therefore, when EIA is conducted for proposed infrastructure, the purpose should be to establish whether such developments are environmentally compatible with locations or sites selected for their construction and if not what can be done to offset their negative repercussions (Glasson *et al*., 2012). In the same EIA processes, key decision-makers must also consider inputs from interested and affected stakeholders during a formal public participation process, thus ensuring joint decision-making (Ogola, 2007). Inevitably, proposed development projects with significant and irreversible residual impacts cannot be permitted nor authorized to proceed, as they will cause massive environmental destruction in the proposed development sites (Du Pisani & Sandham, 2006; Hoffman, 2007; Pope *et al*., 2013; Al-Azri *et al*., 2014). In this way, any anticipated disturbance of natural ecosystems and loss of biological diversity could be avoided and when this is not possible, at least should be minimized and remedied.

Apart from these precautionary measures, integrated environmental management in South Africa also recognizes the importance of utilizing existing natural resources in a sustainable manner for addressing the development needs of present and future generations (NEMA, Act No 107 of 1998). This paper seeks to evaluate how sustainable are proposed tourism-related project proposals in some of the Protected Areas of South Africa. The evaluation was conducted by means of a case study based on the quality of selected EIA reports conducted for infrastructural proposals in and around Protected Areas. The selected EIA reports were utilized as a basis for assessing the environmental impacts of such projects in the Mpumalanga and Limpopo provinces of South Africa by regulatory government departments. The specific projects involved new facilities or expansion of existing ones near or within Protected Areas (PAs) such as special nature reserves, national parks and even biosphere reserves. In terms of project types, the proposals ranged from new guest lodges, river crossings, and roads; types of development actions that can increase tourism activities and their impacts in the Protected Areas.

Conceptual framework and study background

Ferrar and Lötter (2007) defined PAs as interventions for conserving biodiversity through establishing areas that are representative of the variety and spread of biodiversity throughout selected landscapes. The designation of such PAs is being implemented as part of a strategy to manage and conserve biodiversity in South Africa, whilst encouraging the utilization of these areas to benefit people in an environmentally sustainable way (Conservation South Africa, 2012). Protected Areas such as the Kruger National Park and the Vhembe Biosphere Reserve in the Limpopo and Mpumalanga provinces are attractive for tourism and associated facilities, which explains why they are vulnerable to tourism-

related environmental impacts (Lemos *et al*., 2012; Brett, 2018). While acknowledging the importance of tourism for generating foreign revenues in South Africa, it is also critical that development activities that promote tourism in the PAs are undertaken in an open and consultative approach following the recommendations and guidelines of the regional environmental management frameworks as well as the national legislation and regulation for environmental impact assessments (Wildlife and Environment Society of South Africa - WESSA, 2013). In addition to NEMA (Act No. 107 of 1998), the National Environmental Management: Protected Areas Act (NEMPAA) (Act No. 57 of 2003) of South Africa was brought into policy for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes. Simultaneously, NEMPAA (Act No. 57 of 2003) is promoting the utilisation of Protected Areas for the benefit of people, but in a manner that would not be detrimental to the ecological character of such areas. It is therefore imperative for regulatory agencies, environmental managers, and conservation stakeholders to make appropriate decisions when environmental impacts in Protected Areas run the risk of exceeding tolerable levels (Gende *et al*., 2018).

The EIA quality review described in this case study has primarily focused on evaluating the sustainability of proposed infrastructural activities earmarked for sites within or near Protected Areas (PAs). In line with the South African legal and regulatory framework, the EIA requirements for such proposals may be duly addressed by what is known as a Basic Environmental Impact Assessment Report (BEIAR), along with a few specialised studies. EIA processes of this nature are legislated and mandatory for proposals whose environmental impacts are fairly well known although they still require adequate assessment and effective mitigation (Aucamp, 2009).

To this end, our case study evaluated the completeness and the quality of information in 13 BEIARs conducted during the year 2013. These BEIARs were submitted to the relevant regulatory departments (competent authorities) in the Limpopo and Mpumalanga provinces for environmental decision-making, of which all of them were subsequently approved for the proposed development actions. However, the fact that they were approved by relevant competent authorities in their respective jurisdictions does not necessarily mean that they were of satisfactory quality, thus adding further motivation for the current case study.

Methods

Before an explanation on the methods used for the EIA quality review reported in this case study, impact assessment requirements in South Africa are briefly outlined with special reference given to Basic Environmental Impact Assessment Reports (BEIARs) in the South African context.

Impact assessment requirements in South Africa

In South Africa, environmental impact assessments are generally of two types and their requirements and provisions are stipulated in the various EIA Regulations (2006; 2010; 2014) that were enacted to give effect to the overarching goal of integrated environmental management and sustainable development as specified in NEMA (Act No. 107 of 1998). There is a Basic Environmental Impact Assessment (BEIA), which is different to a much intense Scoping and Environmental Impact Assessment (SEIA). Whereas the SEIA is reserved mostly for particularly large and complex infrastructural development projects whose impacts can be far-reaching, significant and cumulative, most BEIAs are restricted for proposed infrastructural facilities whose environmental impacts are fairly well known although they still require adequate and effective mitigation planning.

Although EIA Regulations are in a state of flux and are revised from time to time in South Africa, our case study was based on the requirements specified in Regulation 543 (Environmental Impact Assessment Regulations, 2010) in line with NEMA (Act No. 107 of 1998). Under Chapter 3 of Regulation 543, the requirements for environmental authorisations are clearly stated and more particularly, under Part 2, applicable criteria for undertaking a Basic Environmental Impact Assessment (BEIA) (Section 21-25) are explained. Furthermore, other requirements for BEIAs are provided for in Regulation 546 (Environmental Impact Assessment Regulations, 2010), that is also allied to NEMA (Act No. 107 of 1998). The latter regulations apply specifically to the proposed infrastructural developments in specific identified geographical areas in South Africa, which amongst others cater for Protected Areas. Thus, in line with EIA Regulation 546, such development activities cannot commence without being granted an environmental authorisation via the submission of a Basic Environmental Impact Assessment Reports (BEIARs).

In addition, the following guiding principles abstracted from the NEMPAA (Act No. 589 of 2014) were also incorporated into the assessment rubric or collation sheet used in this case study:

i. To protect ecologically viable areas representative of South Africa's biological diversity and its natural landscapes,
ii. to preserve the ecological integrity of those areas,
iii. to protect all the areas, which are ecologically vulnerable or sensitive,
iv. to assist in ensuring the sustained supply of environmental goods and services, and
v. to manage the interrelationship between natural environmental biodiversity, human settlement and economic development.

For the goals of this case study, 13 BEIARs were selected for quality assessment, by making use of the adapted Lee and Colley Review Package.

The Lee and Colley Review Package

The Lee and Colley review package was chosen for this case study because it is internationally utilised for this purpose (Wood, 2003; Sandham *et al*., 2008a; 2013a). Despite having been developed nearly 20 years ago in the UK (Kabir & Momtaz, 2012), this technique is still commonly used in the evaluation of EIAs across different sectors (Sandham *et al*., 2008a; Jalava *et al*., 2010; Landim & Sanchez, 2012; Chang *et al*., 2013; Sandham *et al*., 2013a; 2013b). Thus, this package was appropriate for the current study although it had to be firstly adapted to the relevant legislative requirements in South Africa as originally explained by Lee *et al*. (1999).

Making use of the adapted Lee and Colley Review Package, the process of reviewing EIA quality is conducted by subdividing the evaluation tasks into what is generally regarded as broad Review Areas. Below such Review Areas are Review Categories, which are subsequently divided further into Review Sub-Categories. As a whole, the different levels of evaluating EIA quality resembles a hierarchical or pyramidal structure as shown in Figure 1 (Sandham & Pretorius, 2008).

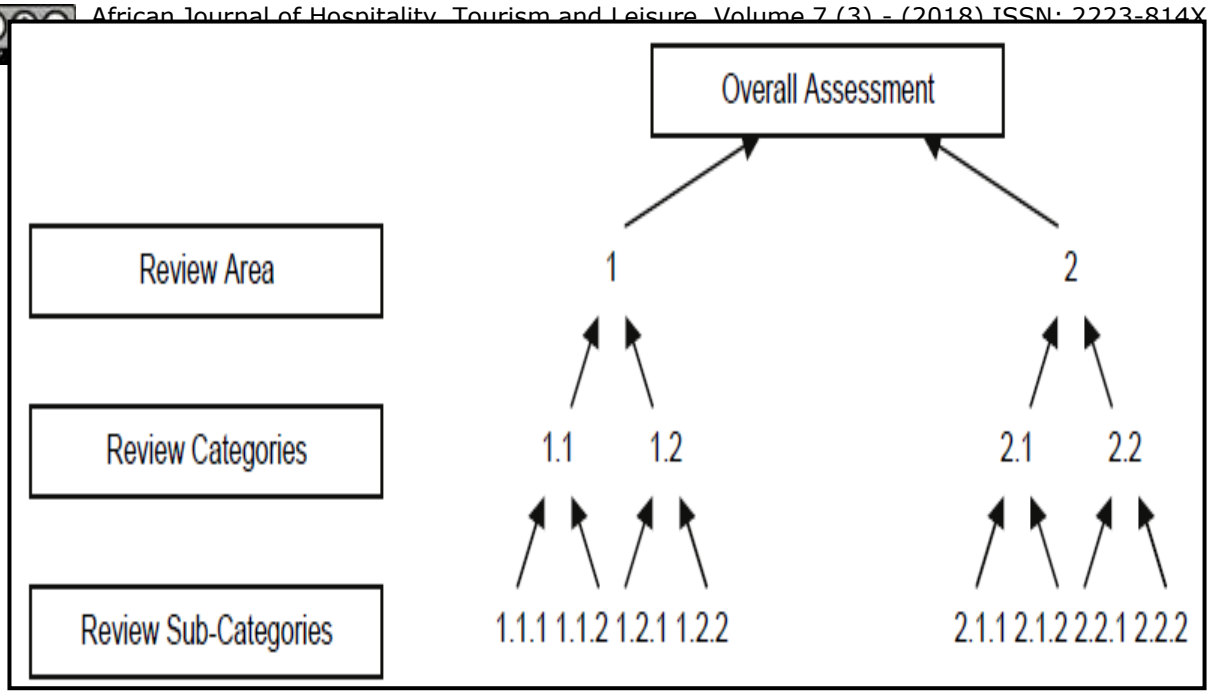

Figure 1: Hierarchical review process of Lee and Colley review package for assessing EIA studies

The Adapted Review Package and EIA quality symbols

The adapted Lee and Colley Review Package used for the EIA quality evaluation in this case is depicted in Table 1. Apart from the regulatory requirements explained in the previous sections, some of the evaluations points mentioned by Sandham *et al*. (2013a) in the South African EIA literature were also included. Table 2 provides an indication of the assessment symbols and grades that were used in the EIA quality evaluation. In keeping with the original Lee and Colley Review Package, quality was judged by assigning or allocating specific symbols that ranged from “A” to “F”.

Whereas “A” represented outstanding EIA reporting quality with relevant tasks performed well, the symbol “F” was assigned for very unsatisfactory and misleading reporting with key tasks poorly undertaken or not attempted at all. Beyond these quality extremes (“A-F”), quality can also be judged to be either “B”, or “C”, or “D” or “E” (Table 2), depending on how satisfactory (“A-C”) or unsatisfactory (“D-F”) specific EIA reports were populated and compiled.

The boundary between “C” and “D” quality was regarded as the transition line between “satisfactory” and “unsatisfactory” BEIARs. Thus, the symbol “C” has been considered borderline for the purpose of this study meanwhile BEIARs “D-F” were grouped together and considered to be very poor quality (Sandham & Pretorius, 2008).

Table 1: Adapted review criteria for the case study

1. DESCRIPTION OF THE ENVIRONMENT *1.1 Description of the development* 1.1.1 Purpose and objectives 1.1.2 Design and size - co-ordinates, whether an activity is linear (description of the route of the activity) or ocean-based etc. 1.1.3 Presence and appearance of completed development 1.1.4 Nature of production processes 1.1.5 Nature and quantity of raw materials 1.1.6 Identification of applicant 1.1.7 Details of EAP 1.1.8 Identification of all legislation and guidelines considered 1.1.9 The need and desirability specified *1.2 Site description* 1.2.1 Area of development site 1.2.2 Demarcation of land use area 1.2.3 Duration of phases 1.2.4 Number of workers/visitors 1.2.4 Means of transporting raw materials *1.3 Wastes* 1.3.1 Types and quantities of wastes 1.3.2 Treatment, disposal and disposal routes 1.3.3 Methods of obtaining quantities of wastes *1.4 Environment description* 1.4.1 Area to be affected by development:- geographical, physical, biological, social, economic and cultural aspects 1.4.2 Effects occurring away from immediate affected environment *1.5 Baseline conditions* 1.5.1 Important components of the affected environment 1.5.2 Existing data sources 1.5.3 Local land use plans, policies consulted and other date collected **2. IDENTIFICATION AND EVALUATION OF KEY IMPACTS** *2.1 Definition of impacts* 2.1.1 All possible effects on environment – cumulative, short, medium and long-term, permanent and temporary, positive and negative 2.1.2 Interaction of effects on – human beings, flora and fauna, soil, air, water, climate, landscape, material assets and cultural heritage 2.1.3 Impacts from non-standard operating conditions – accidents etc. 2.1.4 Impacts from deviation from baseline conditions *2.2 Identification of impacts* 2.2.1 Impact identification methodology – project specific checklists, matrices, panels of experts, consultations etc 2.2.2 A brief description of impact identification methods used *2.3 Public participation process* 2.3.1 Contact general public and special interest groups 2.3.2 Proof of advertising and noticeboards etc. to notify I & APs	2.3.3 Collect opinions and concerns of I & APs notify I & APs 2.3.3 Key Impacts 2.3.4 List of all persons registered as I & APs 2.3.5 Summary of issues raised by I & APs *2.4 Predict*ion of impact *magnitude* 2.4.1 Data to estimate magnitude of main impacts 2.4.2 Methods used to predict impact magnitude 2.4.3 Predictions of impact in measureable quantities *2.5 Assessment of impact significance* 2.5.1 Significance of impacts on affected community and society in general 2.5.2 Significance of impacts in terms of national and international quality standards 2.5.3 Justification of proposed method of assessing significance- assumptions and uncertainties **3. ALTERNATIVES AND MITIGATION** *3.1 Alternatives* 3.1.1 Description of alternative sites 3.1.2 Description of alternative processes, designs and operating conditions 3.1.3 For severe adverse impacts rejected alternatives identified 3.1.4 Comparative assessment of all alternatives identified *3.2 Scope and effectiveness of mitigation measures* 3.2.1 Consider mitigation of all significant adverse impacts 3.2.2 Mitigation measures 3.2.3 Extent of effectiveness of mitigation when implemented *3.3 Commitment to mitigation* 3.3.1 Record of commitment to mitigation measures 3.3.2 Monitoring arrangements 3.3.3 Draft EMP **4. COMMUNICATION OF RESULTS** *4.1 Layout of report* 4.1.1 Introduction 4.1.2 Information logically arranged 4.1.3 Chapter summaries for very long chapters 4.1.4 External sources acknowledged *4.2 Presentation* 4.2.1 Presentation of information 4.2.2 Technical terms, acronyms, initials defined 4.2.3 Statement presented as an integrated whole *4.3 Emphasis* 4.3.1 Emphasis to potentially severe impacts 4.3.2 Statement must be unbiased 4.3.3 Opinion as to whether activity should/should not be authorized 4.3.4 Record of minutes of meetings by EMP with I & APs and response of EMP to comments and issues raised *4.4 Non-technical summary* 4.4.1 Non-technical summary of main findings and conclusions 4.4.2 Summary must cover all main issues

Table 2: Details of BAR quality assessment symbols, grades and ranking

Symbol	Explanation	Quality Grade	Ranking
A	Relevant tasks well performed, no tasks left incomplete	A-B	Good (minor omissions)
B	Generally satisfactory and complete, only minor omissions, admissions and inadequacies	A-C	Satisfactory
C	Can be considered just satisfactory despite omissions and / or inadequacies	C	Borderline
D	Parts are well attempted but must, as a whole, be considered just unsatisfactory because of omissions or inadequacies	D-F	Poor (major omissions and inadequacies)
E	Not satisfactory, significant omissions or inadequacies		
F	Very unsatisfactory, important task(s) poorly done or not attempted		
N/A	Not applicable. The Review Topic is not applicable or it is irrelevant in the context of this Report.		

Statistical analysis

Making use of the assessment rubric or collation sheet depicted in Table 1, every Review Area and subsequent Review Categories for each BEIAR were assessed for their level of quality and the data generated was quantified by means of bar graphs. Furthermore, the non-parametric Kruskal Wallis test was carried out to determine if there were any significant statistical differences among all the Review Areas and Review Categories as they were being ranked from “A” to “F” in the 13 BEIARs.

Presentation of results and discussion

General overview of the results

Table 3 shows the different BEIARs that were compiled for the proposed tourism-related infrastructures in the various Protected Areas of the Mpumalanga and Limpopo provinces in South Africa. Out of the 13 BEIARs assessed, only 16% of them achieved an ‘outstanding’ (“A”) quality grade. Forty five percent (45%) of them were judged ‘satisfactory and complete’ and this was denoted by a “B” grade. Thirty one percent (31%) were ‘just satisfactory’ (“C”) whereas 8% were deemed ‘just unsatisfactory’ (“D”). In terms of the degree or range of generally satisfactory quality (“A-C”), 12 BEIARs (92%) were allocated to this quality rating. Even so, the majority of these reports were assigned either a “B” or “C” ratings, thus indicating that the quality of these BEIAR reports was generally satisfactory although there were a few omissions and few inadequacies where relevant spatial and environmental information was missing. Inevitably, none of the BEIAR reports in this case study were assigned the lowest quality grading as denoted by “E” or “F” symbols (Table 3).

Table 3. List of all BEIARs assessed, the authorizing province and the quality of grades awarded

No.	Name of the BEIARs	Province	Quality Grade
1	Chitwa	Mpumalanga	B
2	Dulini House	Mpumalanga	A
3	Ingwelala Crossing	Mpumalanga	D
4	Jejane	Limpopo	C
5	Johnniesdale	Mpumalanga	C
6	Malamala	Mpumalanga	A
7	N'tsiri Crossing	Mpumalanga	B
8	Oliver's Lodge	Mpumalanga	B
9	Rothsay	Mpumalanga	C
10	Singita Lodge	Mpumalanga	B
11	Singita Workshop	Mpumalanga	B
12	Timbavati	Mpumalanga	B
13	Tintswalo	Mpumalanga	C

The results of the Kruskal Wallis test indicated that there were no significant statistical differences among the different Review Areas and Review Categories as they were being ranked from "A" to "F" during the quality review. Although all of the categories examined displayed different values for Kruskal Wallis H (Table 4), none of their values was significant statistically. The detailed results emanating from this statistical test re presented in Table 4.

Table 4. Results of the non-parametric Kruskal Wallis test to determine whether there was any significant difference existed amongst various grades received by the 'Review Areas' and subsequent 'Review categories' of all the 13 BEIARs

	Grade 'A'	Grade 'B'	Grade 'C'	Grade 'D'	Grade 'E'	Grade 'F'
Kruskal-Wallis H	6.385	4.267	7.504	9.046	0.000	4.618
df (Degrees of Freedom)	7	7	7	7	7	7
Asymp. Sig. (Level of significance)	0.496	0.749	0.378	0.249	1.000	0.706

Quality of Review Area 1

In Figure 2, a summary of the various quality ratings assigned for this Review Area and associated Review Categories is given. This Review Area is based on how well or poorly the Environmental Assessment Practitioners (EAPs) described the environmental settings and baselines regarding the proposed infrastructural projects. In other words, the focus was on the various descriptions that were provided to specific localities earmarked for the proposed infrastructural projects. Proper descriptions are required for both selected sites and proposed projects. The different quality assessments of the associated Review Categories included 1.1, which represented the Description of the proposed developments; 1.2 for Site descriptions; 1.3 for Wastes; 1.4 for Environment descriptions; and 1.5 for Baseline conditions.

All (100%) the BEIARs received satisfactory ("A-C") grades for this Review Area. However, a few discrepancies were observed. Whereas 53.8% of BEIARS were judged to be of a very good ("A-B") quality when it comes to environmental and project descriptions, the rest (46.2%) were at the borderline ("C") end of the quality scale. If such descriptions are vague and inadequate, further impact assessment procedures are bound to be misguided and compromised because the starting baseline is not accurately understood. Nonetheless, when the various Review Categories were examined individually, they were found to be generally compliant ("A-B") (84.6%-100%) with existing EIA regulations (i.e. Regulation 543 and 546 and others) in South Africa, except for few aspects that need improvement and redress. For example, there is a need to provide better estimates on the amounts of wastes (Review Category 1.3 Wastes) anticipated for the proposed projects because when this issue is left unattended, the receiving environments are likely to be polluted, thus rendering existing ecological functions dysfunctional.

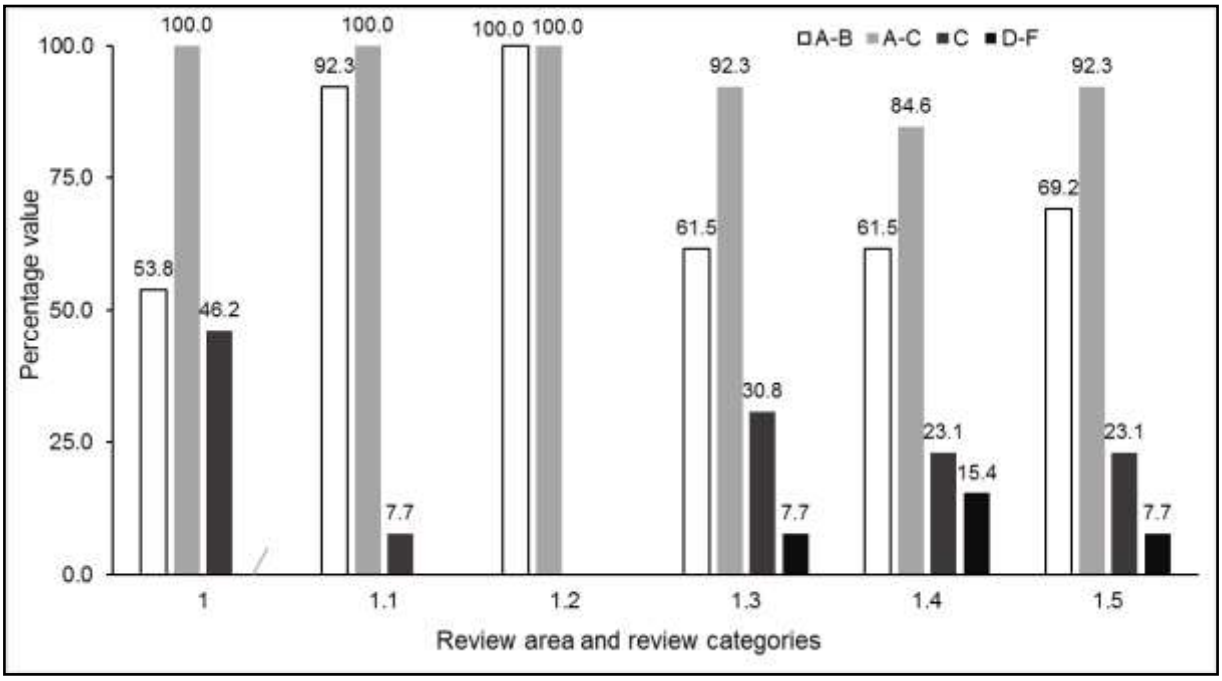

Figure 2. Proportions of quality scores for Review Area 1 and then subsequently for various Review Categories applicable to the 13 BEIARs

Review Area 2

In Figure 3, a summary of the various quality ratings dispensed for this Review Area and associated Review Categories is given. This Review Area is based on how effective the key

impacts were identified and evaluated by the EAPs who prepared the various BEIARs. It can be seen that 100% of these BEIARs were assigned to the ("A-C") quality range, which means that they were generally executed satisfactorily. However, about 30.8% of them were found to be of borderline quality ("C") (2.0). Out of all the Review Categories involved in this Review Area, scores falling in the ("A-C") quality range were markedly high because they ranged from 76.9% to 100%. Even so, BEIARs that were reporting their findings with outstanding ("A-B") quality featured very prominently. For example, up to 84.6% of these reports fell in this quality ("A-B") rating when it came to the Definition of the various environmental impacts (2.2) that could potentially affect Protected Areas. Similarly, the following Review Categories also displayed comparatively superior quality ("A-B") reporting - 84.6% for the Prediction of impact magnitude (2.4) as well as 92.3% for the Public participation process.

Although the manner in which the 2.5 Review Category (i.e. Assessment of impact significance) was addressed by the various BEIARs was generally 100% satisfactory ("A-C"), the proportion (61.5%) of outstanding ("A-B") ones declined to 61.5%, which is the lowest when compared with all Categories in this Review Area. Moreover, the proportion of borderline ("C") quality (38.5%) in this Review Category (2.5) increased markedly higher than in the other related categories. Borderline quality means that this Review Category has just satisfied the barest minimum conditions in dealing with the characterisation of impact significance in these BEIARs, thus pointing out to the existence of serious omissions and inadequacies. While it was relatively easy to characterise impact magnitude in the BEIARs, analysing the degree of impact significance was comparatively weak and problematical.

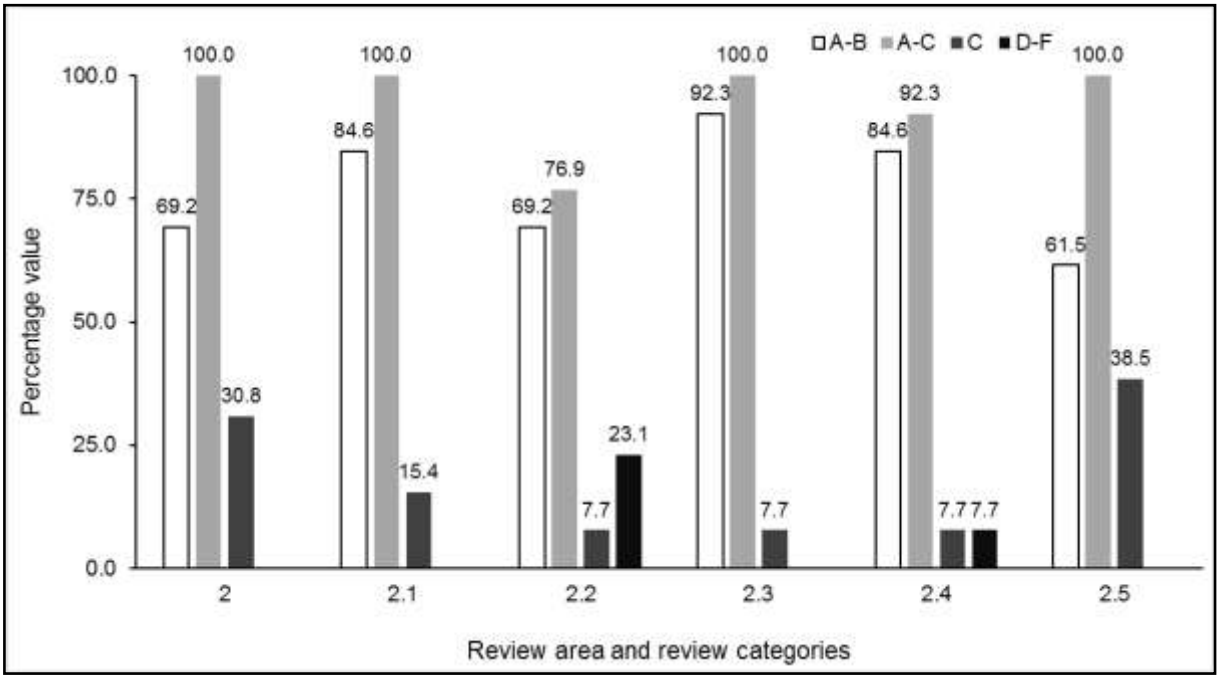

Figure 3. Percentage values of various quality grades for 'Review Area 2 – identification and evaluation of key impacts' and the subsequent 'Review categories' covering all the 13 BEIARs

Review Area 3

The summary of the quality grades allocated for Review Area 3 (Alternatives and mitigation) and its subsequent Review Categories (from 3.1 to 3.3) is presented in Figure 4. This Review Area is based on the reporting of alternatives and mitigation measures that were planned for the proposed development actions in the Protected Areas. The 'Framework

Terms of Reference' for the environmental assessment of development projects states that the evaluation of alternatives is one of the most important aspects of environmental assessment (Paris, 2000). Similarly, with other Review Areas (i.e. 1 and 2), the proportion of generally satisfactory ("A-C") and superior quality ("A-B") ratings were high – 92.3% and 69.2%, respectively. Moreover, the same pattern appeared again for the Review Category (3.3) which involved 'Commitments to mitigation measures' that can help to significantly offset negative environmental impacts from proposed infrastructural reports. The Review Category 3.2 based on the 'Scope and effectiveness of mitigation measures was also well complied with close to 84.6% of BEIARs judged to be extremely well done. All of these higher proportions signify very good BEIAR quality that will take care of the environmental sustainability of proposed tourism-related facilities in the proposed sites within Protected Areas. However, the degree of borderline quality ("C") in two Review Categories (i.e. 3.1 & 3.3) was 23.1%, therefore reflecting some inadequacies in the description of project and site alternatives as well as commitments to mitigations planning.

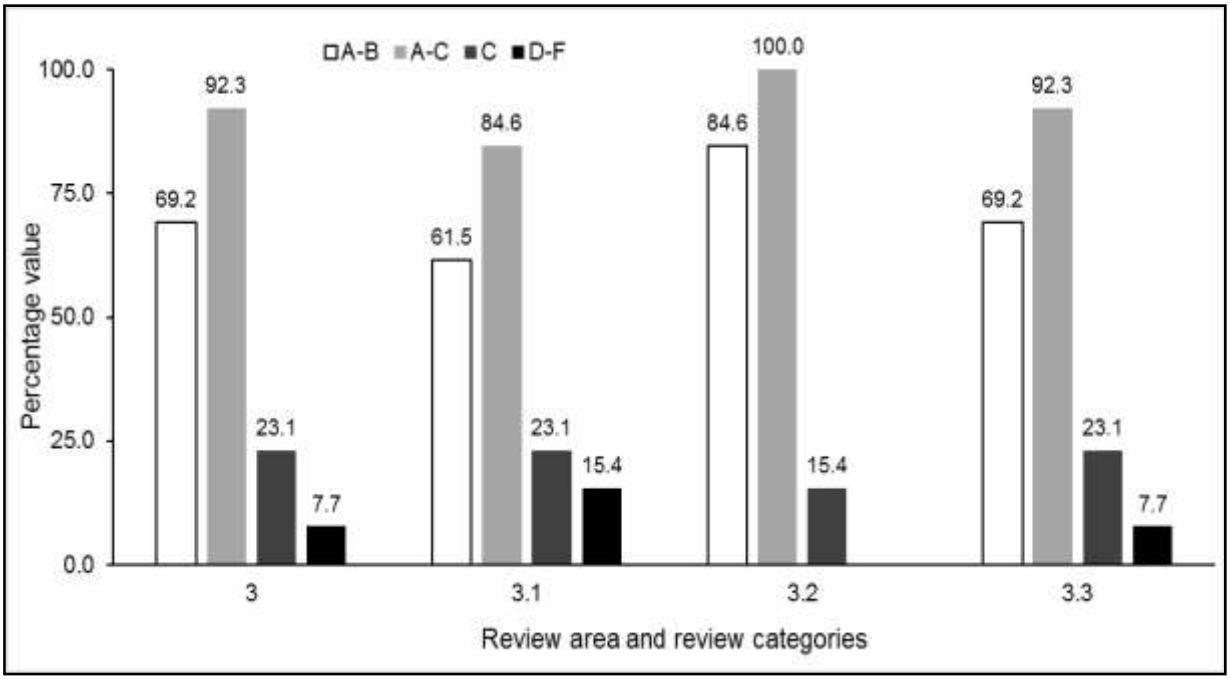

Figure 4. Percentage values of various quality grades for 'Review Area 3 – alternatives and mitigation' and the subsequent 'Review categories' covering all the 13 BEIARs

Review Area 4

In Figure 5, a summary of the various quality ratings assigned for Review Area 4 and associated Review Categories is given. This Review Area is based on how systematic and comprehensive were the communications of assessment findings as provided in the various BEIARs. As shown in Figure 5, overall (84.6%) the communication of these findings was generally satisfactory ("A-C"). Similarly, most Review Categories relevant for this Review Area were also generally compliant with existing legislative and regulatory requirements. However, when compared to other Review Areas, the proportion of those BEIARs that were exceptionally good ("A-B") reduced to 53.8% while the degree of borderline ("C") quality was 30.8%. In addition, the proportion of BEIARs with very poor quality ("D-F") was 15.4%, thus exhibiting the highest degree of bad reporting amongst all of the Review Areas. A similar trend (15.4%) of weak reporting was found in the different Review Categories, namely, 4.1 (Layout of report); 4.2 (Presentation style) and 4.3 (Laying emphasis). Furthermore, the quality involving the manner in which the requirements for Review Category 4.4 (Structure of the non-technical summary) were met was inferior because 38.5% of BEIARs were assigned

this rating. Review Category 4.4 (non-technical summary) had the lowest quality level. This is worrying from an integrated environmental management perspective because the non-technical summary of a BEIAR is one of the most consulted section by both interested and affected stakeholders and regulatory authorities.

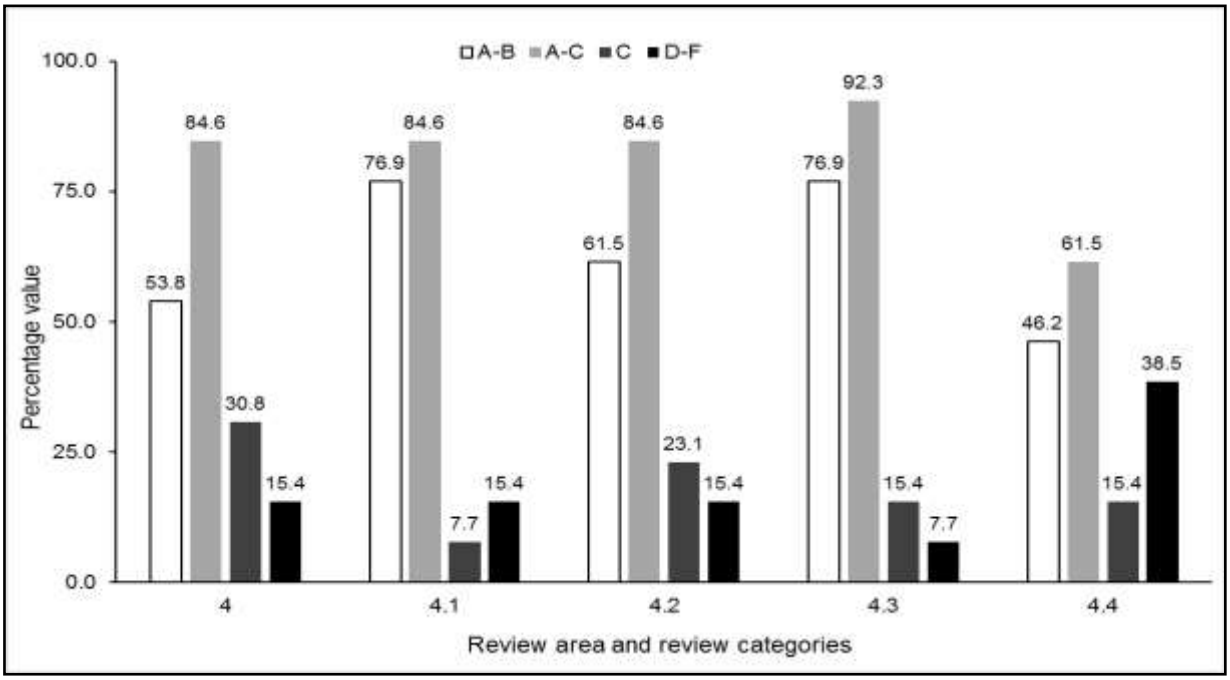

Figure 5. Percentage values of various quality grades for 'Review Area 4 – communication of results' and the subsequent 'Review categories' covering all the 13 BEIARs

Conclusions

The main objective of this case study was to evaluate the quality aspects of BEIARs conducted for the environmental licensing of tourism-related infrastructure within or near Protected Areas in the Limpopo and Mpumalanga provinces of South Africa. Out of the 13 BEIARs assessed, 92% were found to be generally satisfactory as they were assigned "A-C" quality grades. According to the results of this case study, there appears to be adequate precautionary thinking in the environmental planning of proposed tourism-related infrastructure, thus encouraging sustainable development. However, there is room for further improvements in EIA reporting quality as only 54% of these BEIARs were found to display exceptionally superior ("A-B") reporting. Moreover, assigning about 38% of these BEIARs to a borderline ("C") quality signifies the existence of gaps in spatial and environmental information when it came to a number of assessment tasks such as arrangements for waste management and even analyzing the degree of environmental impact significance.

Overall, the legislative and regulatory requirements for Review Areas 1 and 2 were addressed in a high quality manner than for Review Areas 3 and 4. This shows that the more descriptive parts of EIA reporting in this case study seem to be adequately conducted rather than the more analytical tasks such as analyzing the degrees of impact significance or evaluating the feasibility of project and site alternatives. Thus, these findings bear some similarities with some of the South African research results (Pretorius, 2006; Sandham *et al*., 2008a,b; Sandham & Pretorius, 2008; Sandham *et al*., 2013a,b), where the descriptive areas (Review Area 1) tend to be undertaken relatively better than the more analytical areas (Review Area 3). Nevertheless, the results of this case study have shown that the quality level of EIA reporting is generally compliant regarding the proposed infrastructures in the Protected Areas.

Acknowledgements

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