Impact Assessment and Project Appraisal

ISSN: 1461-5517 (Print) 1471-5465 (Online) Journal homepage: www.tandfonline.com/journals/tiap20

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To cite this article: F. P. Retief, R. C. Alberts, D. Cilliers, C. Roos, J. Moolman & A. Bond (2025) Unique features of environmental impact assessment (EIA) in protected areas (PAs) – towards best practice principles, Impact Assessment and Project Appraisal, 43:3, 171-178, DOI: 10.1080/14615517.2025.2470936

To link to this article: https://doi.org/10.1080/14615517.2025.2470936

Published online: 03 Mar 2025.

IMPACT ASSESSMENT AND PROJECT APPRAISAL
2025, VOL. 43, NO. 3, 171–178
https://doi.org/10.1080/14615517.2025.2470936

Unique features of environmental impact assessment (EIA) in protected areas (PAs) – towards best practice principles

F. P. Retief[a,b], R. C. Alberts[a,b], D. Cilliers[a,b], C. Roos[a,b], J. Moolman[a] and A. Bond[a,b,c]

[a]Research Unit for Environmental Sciences and Management, North-West University, Potchefstroom, South Africa; [b]Protected Areas Research Group, North-West University, Potchefstroom, South Africa; [c]School of Environmental Sciences, University of East Anglia, Norwich, UK

ABSTRACT

Protected areas (PAs) preserve ecological system integrity and biodiversity but are threatened by anthropogenic drivers of biodiversity loss such as land use change, direct exploitation of natural resources, land fragmentation, pollution, climate change, and invasive alien species. Internationally, environmental impact assessment (EIA) is a key policy instrument that guides development decisions that affect PAs, especially in the southern African region. This paper aims to identify unique features of EIA in PAs by using South African PAs as a case study towards developing best practice principles. We achieve this through conducting a workshop attended by 81 individuals representing six stakeholder groups, namely, consultants, government entities, protected area management, environmental NGOs, and academics. The results show that EIA within this PA context uniquely requires a more ecocentric ethical framing, rather than an anthropocentric framing of sustainable development. Moreover, PAs face unique governance arrangements, different stakeholder engagement expectations, and experience a greater likelihood of impacts being judged to be significant with limited mitigation options apart from avoidance. Five best practice principles are recommended to incorporate these unique features into EIA decision making affecting South African PAs, although they are also transferable to other similar country contexts where socio-economic development pressures threaten PAs.

ARTICLE HISTORY
Received 15 September 2024
Accepted 18 February 2025

KEYWORDS
Environmental impact assessment; best practice principles; protected areas; conservation; biodiversity

1. Environmental impact assessment (EIA) within the protected areas (PAs) context

The drivers of anthropogenic biodiversity loss are identified as land use change, direct exploitation of natural resources, land fragmentation, pollution, climate change and invasive alien species, ranked in this order of importance (Jaureguiberry et al. 2022). Formally protected areas (PAs) are crucial for conservation because they combat all these drivers and are therefore indispensable for preserving ecological system integrity and biodiversity globally (Schulze et al. 2018; Geldmann et al. 2019; Corlett 2020). Although over time the founding reasons for the establishment of PAs varied, and many types and typologies of protected areas evolved, there is recent international agreement that they should aim to achieve long-term conservation objectives (Mace 2014; Sandbrook et al. 2019). The International Union for the Conservation of Nature (IUCN) defines 'protected areas' as: '*a clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values*' (Mitchell et al. 2018, p. xii).

However, research shows that notwithstanding their recognised importance in combating biodiversity loss, in practice, the designation of PAs is no guarantee for biodiversity protection (e.g. Craigie et al. 2010). There is evidence that individual PAs suffer from biodiversity loss and that development pressures are on the rise (Du et al. 2015; Alberts et al. 2022). Jones et al. (2018, p. 788) found that one third of PAs globally are '*under intense human pressure*', which suggests that management practices and/or development control is failing to deliver the expected conservation outcomes. This is particularly true not just for South Africa, but the entire southern African region, where some of the largest and most iconic PAs are under intense development pressure by for example mining and land transformation. In South Africa, as well the southern African region, environmental impact assessment (EIA) is one of the key decision support instruments for developments affecting PAs (Retief et al. 2011; Sandham et al. 2020; Alberts et al. 2021; Claassens et al. 2022; Malepe et al. 2022). However, anecdotal evidence suggests that EIA might be failing these areas by allowing certain incompatible activities (e.g. Alberts

CONTACT F. P. Retief Francois.Retief@nwu.ac.za Research Unit for Environmental Sciences and Management, North-West University, Private Bag X6001, Potchefstroom 2520, South Africa

et al. 2022; WWF 2023; Ground Up 2024; Namibia Chamber of Environment 2024). Therefore, amidst recognition of its importance, there has been limited reflection on what makes EIA practice in PAs unique and what this might mean for improving practice (Alberts et al. 2021; Bond et al. 2022; Retief et al. 2022). In response, this paper aims to identify unique features of EIA for developments in PAs, using South Africa as a case study, with a view to contribute towards developing best practice principles.

The next section explains the methodology. This is followed in section 3 by a description of the unique features of EIA in protected areas. We conclude in section 4 by recommending five best practice principles to be incorporated into EIA practice for PAs in South Africa, and which are potentially applicable to other regions worldwide.

2. Methodology

Based on the understanding that EIAs are failing to prevent inappropriate developments in South African PAs (see for example Bond et al. 2018, 2021; Alberts et al. 2021, 2024), a regional stakeholder workshop was organised at the International Association for Impact Assessment (IAIAsa), South African chapter annual conference in Skukuza, Kruger National Park, in August 2023. An open invitation to the workshop was extended to all conference delegates, resulting in the participation of 81 individuals from diverse stakeholder groups, including EIA consultants (30 individuals – 36%) and government entities (29 individuals – 36%), protected area management (8 individuals – 10%), Environmental NGOs (8 individuals – 10%) and academics (6 individuals – 8%). The level of participation, considering competing parallel sessions in a conference with 350 registrants, adds further weight to the validity of the underlying assumption about the failings of EIA. Accordingly, the theme of the workshop was to explore unique features of EIA practice in the context of PAs and how this might differ from standard EIA practice. The workshop design was sensitive of the potential to prime (bias) responses if improperly designed and structured, and therefore an open-ended question was posed, *'What makes EIA practice for developments in protected areas (PAs) unique from standard EIA practice?'* This question provided participants the opportunity to think broadly about the unique application and contribution of EIA in the PA context. It was emphasised that participants express their personal views rather than those of the organisations or stakeholder groups they represent. For this reason, a stakeholder group analysis was not conducted.

To ensure a systematic and in-depth discussion, the workshop participants were first divided into three large groups of between 25 and 28 individuals and then each large group into smaller groups of five to six individuals. The final tally of smaller groups was 14, each of which was then tasked to identify a maximum of five unique features in relation to the workshop question. These points were captured on comment sheets and were collected for analysis. The smaller groups then reported back to their larger group where consensus views were collated and validated amongst the participants (to check consensus of views put forward). Ultimately, the three larger groups then reported back to the overall group of 81 where consensus views were captured and graphically presented on 'Mural' software.[1] However, in this case, the themes were agreed by a broad range of stakeholders based on sometimes heated debate. As such, they have been partially validated by practitioners, many with experience of undertaking EIA in PAs.

3. Results - unique features of EIA in protected areas

Figure 1 presents the results for the 14 smaller groups. Of the 10 identified unique features four were identified by 10 to 13 of the 14 smaller groups. The consensus views from the three large groups confirmed the following four most prominent unique features, namely: unique EIA objectives; stakeholder engagement; significance determination; and application of the mitigation hierarchy. These features are discussed in more detail in the sub-sections below. However, other unique features related to the requirements to also: incorporate more specialist inputs; longer and more flexible timeframes; stricter screening; effective enforcement of conditions and legal requirements; consideration of broader cumulative impacts; and longer-term monitoring were also highlighted as being important by between 2 and 5 of the 14 smaller groups. However, the method of identifying and validating principles requires features achieving a high level of consensus (see for example Vanclay 2003; Morrison-Saunders et al. 2021, 2023). To this end, it was decided to only consider features that achieved more than 70% consensus across the smaller working groups.

3.1. EIA objectives and ethical framing

The EIA feature that achieved the highest level of agreement across the 14 smaller group discussions was that the objectives of EIA within PAs differ fundamentally from standard EIA practice. Results shows that 13 of the 14 smaller groups highlighted this view. Supportive statements included *'EIA should uniquely promote conservation outcomes rather than sustainable development outcomes', 'EIA needs to align with the conservation goals of Park Management Plans', 'EIAs should ensure tiering and alignment with higher level conservation plans', 'EIA should give effect to the conservation visions of*

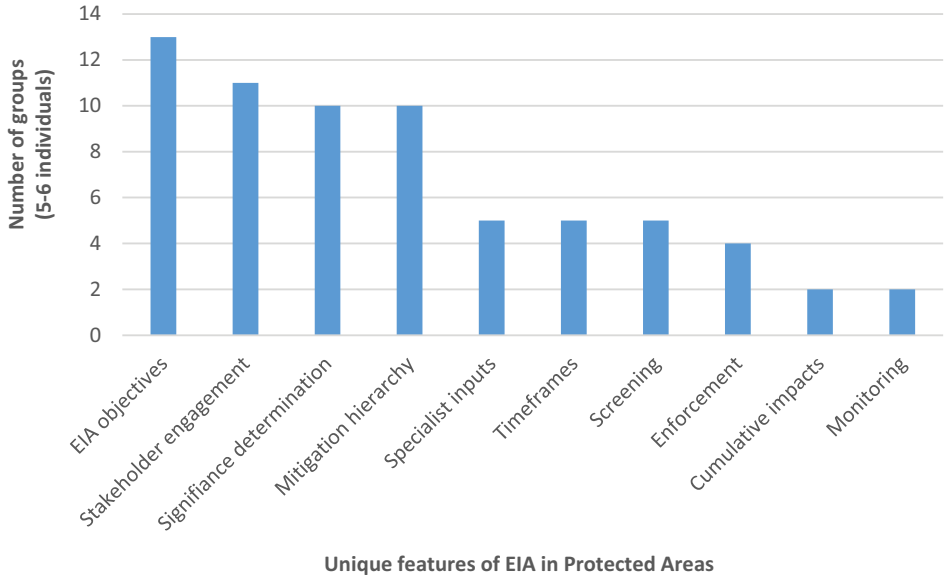

Figure 1. Unique features of EIA in protected areas (n = 14 smaller groups: 5–6 members).

different protected areas' and 'EIA need to consider the impacts on long term conservation success'.

The view that EIA should aim towards different objectives has significant implications for practice, both from an ethical framing and trade-off decision making perspective. Recognising that the appropriate level of biodiversity protection to be supported by EIA is an ethical consideration, Bond et al. (2021) took an environmental ethics perspective to explain how different levels of protection are associated with different ethical positions on a spectrum from anthropocentrism (where only humans have intrinsic value) through to ecocentrism (where all individuals of all species have intrinsic value). The level of biodiversity protection has been shown to increase along this spectrum from anthropocentrism through to ecocentrism. Based on this, Bond et al. (2021) explored what ethical position guides general EIA practice together with the subsequent level of biodiversity protection EIA can then reasonably expect to deliver. This is based on the understanding that EIA functions within a political context and associated policy goals that reflect some form of sustainable development. It therefore seems that based on the workshop results and the views of Bond et al. (2021), a more ecocentric ethic is needed to guide the development of EIA best practice principles and ultimately decision making within PA contexts. We conclude that a more ecocentric ethic does not currently exist in relation to international EIA best practice principles and/or guidelines within or outside of protected areas, and that this paper would be a first attempt to recommend this. A more ecocentric approach would acknowledge the following (Naess 1973; Richardson 2005; Horsthemke 2017; Bond et al. 2021):

- All living things have intrinsic value outside of their utility to humans.
- Living things do not have to prove their value or utility to humans to deserve/justify their existence.
- Achieving non-regression and no incremental loss of ecological integrity or biodiversity in protected areas. This means that in relation to the mitigation hierarchy for example, only avoidance is an acceptable mitigation option.
- Following a stewardship approach that requires an inherent duty of care to conserve and to expand protected areas for future generations.
- Due to high levels of uncertainty related to impact prediction and mitigation in unique areas with high biodiversity value, a precautionary approach should be followed.

To conclude, the economic discourse on sustainable development, which tends to prevail in political decision-making, is overly anthropocentric and provides EIA with only a restricted mandate to prevent incremental biodiversity loss (Bond et al. 2024). *'The bottom line is that, outside protected areas, and assuming their boundaries do not change, EIA will continue to consider the implication for biodiversity of human development, but that incremental loss of biodiversity is inevitable where current understandings of sustainable development prevail'* (Bond et al. 2021, pp. 5–6). We argue that this is also true for EIA within PAs. Therefore, subject to an anthropocentric ethical framework, EIA can do no more than contribute to delaying incremental biodiversity loss and erosion of PAs. Given that this ethical position fails to protect biodiversity over time, anthropocentrism would not suffice as an effective ethical framework for EIAs to achieve conservation objectives, hence the following best practice principle.

Best Practice Principle 1: EIA for developments affecting PAs must apply an ecocentric ethical framing.

In dealing with trade-offs towards achieving conservation objectives, the decision-making context presents a unique governance context. Within southern Africa developments within PAs are typically initiated and approved by government and therefore in government owned protected areas represents a form of self-regulation. However, the PA governance context also typically represents the interface between different (sometimes extreme) competing policy objectives within government ministries and departments related to conservation and socio-economic development. Depending on the jurisdiction, these competing policy interests are vested within different organs of state. The decision-making mandate for achieving conservation objectives (and increasingly associated socio-economic objectives) lies with the management/conservation authority of the protected area while development mandates lie with separate state departments responsible for tourism, mining, agriculture, etc. The legitimate fear of workshop participants was that decision makers within the South African context are bound to trade-off and prioritise sustainable development and socio-economic objectives over conservation objectives. This means that EIA practice in PAs needs to be directed towards different conservation objectives rather than sustainable development objectives generally expected from EIA practice outside of protected areas, hence the following best practice principle:

Best Practice Principle 2: EIA governance and decision making must prioritise delivering conservation objectives above sustainable development objectives in PAs.

3.2. Stakeholder engagement

The workshop results show that 11 of the 14 smaller groups identified stakeholder engagement as a key unique factor for EIA in protected areas. This was also confirmed as a consensus view during the larger workshop group feedback session. The participants highlighted that developments affecting protected areas elicit particularly strong and diverse views from stakeholders. This is because the importance and value of these areas are, by definition, of local, national and even international concern. Moreover, local communities and individuals harbour strong emotional connections to these areas and what they represent. EIA practice needs to reflect the critical role of strong stakeholder networks in achieving conservation goals. Furthermore, EIA may in certain instances be the only governance mechanism to inform decision-making within PAs outside of the PA management agencies or structures, providing the public with important insight and a voice to influence developments within these areas (Alberts et al. 2021). The feedback stated, *'Community inputs are critical, these include those directly affected but also those from far away claiming a strong connection to the PAs as part of their cultural heritage.', 'Stakeholder representation is much more diverse and pluralistic than for standard EIA.', 'Public participation requires inclusive processes that cover local, regional and even international communities.', 'It is extremely difficult to balance and/or satisfy all stakeholder expectations in the PA EIA context.'* and *'Standard methods of stakeholder engagement and public participation will not suffice in PA contexts, the range of stakeholders is too broad and the interest in these areas are too intense.'*

Best practice EIA has always recognised the need to deal with pluralism in stakeholder views (Palerm 2000; Morrison-Saunders et al. 2023). However, the workshop outcomes highlight that stakeholder consultation in relation to protected areas seems to be uniquely challenging with intense vested interest across highly diverse groups. However, research on EIA in protected areas has highlighted that in some instances public participation is particularly well dealt with due to the scrutiny and controversial nature of certain developments (see for example Sandham et al. 2020; Alberts et al. 2021), while in other cases, EIA is abused to legitimise incompatible and undesirable developments in PAs (Malepe et al. 2022).

Best Practice Principle 3: Stakeholder engagement/participation within EIA must be sensitive to the plurality of views, locally, nationally and internationally towards achieving PA conservation objectives.

3.3. Significance determination

Significance determination lies at the heart of EIA and underpins ultimate decision making (Wood 2008; Ehrlich and Ross 2015; Retief et al. 2023). For example, research on the quality and effectiveness of EIA in PAs for national parks in South Africa highlighted dealing with mitigation and significance as key weaknesses (Sandham et al. 2020; Alberts et al. 2021; Malepe et al. 2022). Moreover, research on the quality of biodiversity inputs to EIAs in areas with high biodiversity value shows particular weakness in dealing with biodiversity significance thresholds (Hallatt et al. 2015; Swanepoel et al. 2019; Wentzel et al. 2023). The workshop results show that 10 of the 14 smaller groups highlighted the unique context for significance determination when considering developments affecting PAs. These areas are designated because of an exceptional international natural or cultural resource that is valued and justifies protection (i.e. Cape Floral Kingdom protected in the Table Mountain National Park and the cultural heritage of the Nama People preserved in the Richtersveld National Park).

Significance thresholds would therefore be expected to be higher for most, if not all, environmental components/attributes. Existing significance thresholds or standards for biodiversity, noise, water quality, waste management, etc. might therefore not be appropriate and might require stricter standards. The sensitivity of these areas and what this means for significance determination and judgement distinguish EIAs in protected areas from general practice. The workshop statements include, *'Significance thresholds need to be reconsidered in the PA context.', 'Impacts acceptable outside the park should not be acceptable inside the park.', 'We need separate standards inside PAs.', 'There is hardly low or medium significant impacts inside PAs, they should all be considered high or very high,'* and *'Significance determinations cannot rely on standard EIA practice guidelines.'*

Best Practice Principle 4: All environmental impacts should be assumed to be significant; therefore, significance thresholds should be tailored to the conservation context and designed to achieve relevant conservation objectives.

3.4. Mitigation hierarchy

In terms of mitigation, it is evident that limited options for mitigation exists, due to the inherent sensitivity of these area. The best practice principles for dealing with 'Biodiversity and Ecosystem Services in Impact Assessment' in EIA generally emphasise the need to rigorously apply the mitigation hierarchy (Brownlie and Treweek 2018), whereas that hierarchy is not valid in a PA where only avoiding impacts preserves the objective to protect it. This is a particular challenge given the increasing focus on biodiversity offsetting which Bull et al. (2013, p. 369) argue is controversial because of '*the need to accept ecological losses in return for uncertain gains*'. Workshop feedback shows that 10 of the 14 smaller groups highlighted that the application of the mitigation hierarchy should be uniquely considered. The feedback includes the following statements, *'Don't avoid using avoidance', 'Avoidance should be the only mitigation option.', 'The standard mitigation hierarchy does not apply because only avoidance seems appropriate,' and 'Avoid offsets as a mitigation option'*. In view of the latter the following best practice principle is proposed in relation to the mitigation hierarchy:

Best Practice Principle 5: All significant impacts must be avoided, whilst the rest of the mitigation hierarchy does not apply.

4. Conclusion and way forward

Using South Africa as a case country, this paper identified five best practice EIA principles for developments affecting PAs. We argue that current EIA practice, if not modified for PAs, will be ineffective and merely serve to erode biodiversity protection in PAs over time in favour of socio-economic development (see also Alberts et al. 2024). We foresee the way forward as being to share the following best practice principles with a wider international audience with a view to test, validate, and ultimately operationalise them (possibly in the form of guidelines) for different regional and national contexts. The international implications of applying these five principles could be the following:

(1) *Best Practice Principle 1 - EIA for developments affecting PAs must apply an ecocentric ethical framing*: This principle challenges the anthropocentric ethical framing that currently exists for most EIA systems worldwide. In practice it will likely require jurisdictions to develop parallel ecocentric based EIA systems, specifically to deal with developments affecting PAs. This could be achieved though for example a revised screening mechanism that direct these kinds of developments to more fit for purpose processes and significance thresholds. We envisage a screening process, whereby only certain low-impact activities be considered for EIA within PAs, those not listed are automatically rejected. We recognise that this suggests radical law reform and departure from established EIA ethical foundations (Bond et al. 2021, 2024). Principle 1 also provides the foundation for the adoption and implementation of the rest of the principles since it is difficult to see how principles 2 to 5 could be applied within an anthropocentric ethical framework.

(2) *Best Practice Principle 2 - EIA governance and decision making in PAs must prioritise delivering conservation objectives above sustainable development objectives*: This principle would be especially relevant for EIA systems that are objectives-led, geared towards delivering more sustainable development outcomes. Designing EIA systems towards different outcomes and/or objectives away from sustainable development towards conservation outcomes is also a radical proposition. Following on from the first principle we again recommend the development of a parallel EIA system tailored to the specific needs of PAs, which should first and foremost

be concerned with biodiversity and ecological protection above socio-economic development.

(3) *Best Practice Principle 3 - Stakeholder engagement/participation within EIA must be sensitive to the plurality of views, locally, nationally and internationally towards achieving PA conservation objectives*: It could be argued that this principle is already established in many EIA systems, although in this instance the purpose and aim of the stakeholder engagement/participation is redirected towards PA objectives. Therefore, applying Principle 3 links strongly with and supports Principle 2.

(4) *Best Practice Principle 4 - All environmental impacts should be assumed to be significant; therefore, significance thresholds should be tailored to the conservation context and designed to achieve relevant conservation objectives*: This principle requires a different definition and related thresholds for levels of significance, compared to standard EIA practice outside of PAs. For example, threshold classification for acceptable levels of land transformation/modification, biodiversity loss, noise and visual impacts, increased access, resource extraction, pollution, etc. will be much higher. In most instances significance classification related to environmental attributes will vary only in degrees of 'high', 'very high' and 'exceptional' rather than including the standard options of 'medium' and 'low' significance. Achieving the latter will most probably require policy and law reform.

(5) *Best Practice Principle 5 - All significant impacts must be avoided, whilst the rest of the mitigation hierarchy does not apply*: This requires a paradigm shift from standard EIA mitigation practice, especially when judging significance 'after mitigation'. For example, location, layout, design, type, operational, timing and technology alternatives will be even more important in providing avoidance mitigation solutions and options. We envisage in most instances mining development will (rightfully) be deemed fatally flawed since reasonable and feasible avoidance options would not be possible. This means that mining as an activity where impacts cannot be avoided can never be considered within PAs. Similarly, high levels of precaution should be applied in relation to potential unforeseen and significant residual impacts. Where projects present high levels of uncertainty and residual impacts, they should not be approved/considered in the PA context.

We, recognise that the five principles proposed above do present fundamental challenges to the *status quo* of impact assessment regimes. However, we are of the opinion that this challenging and potentially uncomfortable debate is worth having to optimise the contribution of EIAs to the protection of biodiversity, especially within the context of PAs. As shown, the approach followed in this paper could also be applied to develop or test EIA best practice principles in other unique sectors such as mineral extraction, transport, and energy. Reflection on fundamental principles guiding EIA decision making within different sectors and contexts is a key requirement for continual improvement and refinement of best practice towards delivering more effective EIA.

Note

1. Mural Software - https://www.mural.co.

Disclosure statement

No potential conflict of interest was reported by the author(s).

ORCID

F. P. Retief http://orcid.org/0000-0001-7164-9593

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