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**Assessing the utility of Environmental Factors and Objectives in Environmental Impact Assessment
practice: Western Australian Insights**
Professional Practice Paper

Virginia Dahlitz *- Environmental and Conservation Sciences, Murdoch University; email:
vdahlitz@outlook.com

Angus Morrison-Saunders - Environmental and Conservation Sciences, Murdoch University, Western
Australia and School of Environmental Sciences and Development, North West University, South
Africa; email: a.morrison-saunders@murdoch.edu.au

*corresponding author

Assessing the utility of Environmental Factors and Objectives in Environmental Impact Assessment practice: Western Australian Insights

Professional Practice Paper

Abstract

Environmental factors and objectives are formally identified during the scoping stage of Environmental Impact Assessment (EIA) to structure and focus individual assessments. Environmental factors are broad components of the environment while objectives set the desired outcome for a specific factor. This research assesses the utility of environmental factors and objectives in EIA practice based upon a combination of literature review and interviews with 21 EIA practitioners from Western Australia. Further to providing focus and structure for EIA, practitioners also use environmental factors and objectives for decision making throughout the process. The majority of practitioners also note that factors and objectives are value adding and useful to their EIA practice. Due to their inherent subjective natures, interviewees noted a lack of consistency regarding how to meet the objectives and challenges in determining the significance of impacts on a factor. Identified opportunities to enhance use of objectives and factors in EIA included provision of more guidance, especially criteria or standards to apply and improve knowledge sharing between EIA stakeholders.

Keywords: scoping, environmental factors, environmental objectives, EIA

1. Introduction: research rationale, aim and methods

Environmental factors and objectives are used to focus an environmental impact assessment (EIA) process on significant issues specific to each individual assessment (Ross et al 2006; Donnelly et al 2008; Morrison-Saunders et al 2014). They also provide a 'measuring stick' against which proposal impacts can be assessed and structure for processes and reporting (Therivel 2010; Glasson et al 2012 p307; EPA 2013a).

Environmental factors are broad components of the environment such as flora, fauna, water quality or air quality which may be impacted by a proposal (Beanlands and Duinker 1983; Therivel 2010; EPA 2013a). Environmental objectives are the desired outcome, goal, or direction for change for a specific factor (Therivel 2010; EPA 2013a), such as to reduce air pollution or maintain biodiversity. Environmental factors and objectives have been central to the EIA process in Western Australia (see Box 1) for around two decades. Our research was prompted by a recent revision (EPA 2013a) of the environmental factors and objectives, and the subsequent one year review of the guidance material on their use in EIA. There has never been an evaluation of the use of environmental factors and objectives in Western Australia. We became interested in finding out how practitioners used and experienced them, and to reflect on possible ways to enhance practice accordingly.

The aim of this research is to assess how environmental factors and objectives are employed in EIA, with a focus upon Western Australian experience. More specifically we sought answers to four broad and open questions regarding the utility of environmental factors and objectives in EIA practice:

1. How are environmental factors and objectives utilized by practitioners conducting EIA?
2. How valuable (useful) are environmental factors and objectives in EIA practice?
3. What are the issues emerging from the application of environmental factors and objectives?
4. How might EIA practice be enhanced with respect to environmental factors and objectives?

In seeking answers to these questions, our methodology was based upon literature review and interviews. Interviews were conducted in December 2013 and January 2014. A semi-structured interview method was used which provided flexibility in the techniques that could be used for conducting the interviews, i.e. face-to-face, over the phone or via email (Wilson 2012) however, the questions for all participants were the same. The perspectives of 21 EIA practitioners were obtained, comprised of nine (9) consultants, nine (9) regulators, two (2) other and one (1) proponent. All interviewees have 5 years or more experience in EIA in WA. We identified four types of EIA practitioner: *proponents* (public or private) implementing projects subject to EIA, *consultants* engaged by proponents to undertake key EIA tasks, *regulators* responsible for administering EIA (specifically staff within the Office of the Environmental Protection Authority or members of the EPA itself), and *others* (including government agencies and academics with active participating roles in EIA). Several of the consultants had previously worked as employees of proponents and vice-versa. Similarly, many of the consultants/academics had served on the EPA or been staff employees of the Office of EPA. We indicate the specific role of interviewees when discussing our findings when this appears relevant for contextualising particular responses. Otherwise the dynamic nature of the EIA profession suggests that Western Australian practitioners are often experienced across multiple roles and perspectives.

<<Box 1 near here>>

Box 1 Environmental factors and objectives in EIA in Western Australia

The *Environmental Protection Act 1986* (EPA Act) establishes the independent five member Environmental Protection Authority (EPA) and makes provision for it to undertake EIA of proposals likely to have a significant impact on the environment. For each project assessed, the EPA is required to report to the Minister for the Environment on the 'key environmental factors' of a proposal (EPA Act s44). Since the late 1990s, the EPA and their supporting staff in the Office of the EPA have used a standard list of environmental factors and endeavoured to focus attention on the objective they established for each factor during all stages of EIA (Bowen 1997; Morrison-Saunders and Bailey 2000). The first formal codification of this list (EPA 2004) was shortened in 2013 by removing or merging some factors and objectives and changing wording of objectives to be more encompassing (EPA 2013a). New matters of significance were added however the 2013 list is shorter than the 2004 list.

There are 15 environmental factors grouped under the headings of Sea, Land, Water, Air and People and 2 integrating factors pertaining to Offsets and Rehabilitation, and Closure. Each factor has an environmental objective set by the EPA (EPA 2013a). For example, for the key environmental factor Hydrological Processes under Water it is to '*Maintain the hydrological regimes of groundwater and surface water so that existing and potential uses, including ecosystem maintenance, are protected*'. The emphasis of the factors is principally biophysical. No economic, well-being or lifestyle considerations are included, with the People category limited to matters where a direct physical change to the environment is involved (e.g. visual impact). During scoping, the specific environmental factors (and their corresponding objectives) relevant to an individual assessment, are identified from this list, and are continually reassessed throughout the EIA (EPA 2013a).

2. Utility of environmental factors and objectives in EIA practice

In presenting our main findings, we integrate perspectives from the international literature and local

Western Australian EIA materials with those of the interviewees for each of our research questions. A summary of the most frequent responses by EIA practitioners pertaining to each of the research questions is provided in Table 1.

<<Table 1 near here>>

Table 1. Summary of Practitioner Perspectives

Practitioner Perspectives	Frequency
1. How are environmental factors and objectives utilized by practitioners conducting EIA?	
To identify what is going to be done/focused on	15 (71%)
As a framework and structure for EIA	13 (62%)
For decision making	9 (43%)
2. How valuable (useful) are environmental factors and objectives in EIA practice?	
Factors and objectives are of use or value	17 (81%)
Factors and objectives are of no/limited use or value	3 (14%)
Mixed view	1 (5%)
3. What are the issues emerging from the application of environmental factors and objectives?	
Getting consistency in understanding of how to meet the objectives	3 (14%)
Challenging to define and determine the significance	3 (14%)
How complex, multi-factor impacts and cumulative impacts are going to be handled and reported	2 (9%)
4. How might EIA practice be enhanced with respect to environmental factors and objectives?	
More guidance (criteria and standards to be developed)	7 (33%)
Improve knowledge and data/information sharing	5 (24%)
Improve procedural aspects	4 (19%)

2.1 How are environmental factors and objectives utilized by practitioners conducting EIA?

The three most frequent uses of environmental factors and objectives (Table 1) identified by interviewees related to EIA focus, structure and decision-making; we address each in turn.

While the use of environmental factors and objectives to focus is commonly identified in the international literature, as we demonstrated in our introduction, the Western Australian EIA practitioners provided some further insights on this as the following responses illustrate:

'Generally I use the environmental factors and objectives to determine the environmental values that should be considered as part of an assessment'

'The objectives are used to focus the assessment and measure the environmental impact of a project against'

The mention of 'values' in the first quote and notion of providing a measure for impacts are interesting. Another practitioner stressed that *'there is no quantitative process in regard to the use of factors and objectives'*, meaning that their trigger and application is subjective and will vary according to the values or views of individuals. Interestingly two of the most senior/experienced practitioners interviewed (who have worked in a variety of roles) mentioned identifying the *'fatal-flaws'* of a project meaning impacts on environmental factors that could render a project unacceptable unless it is *'re-designed'* to avoid the environmental factor/s or to receive *'the highest priority of management'* in order to meet the environmental objective for that factor.

With respect to using the environmental factors and objectives as a structure for EIA, some illustrative responses included that they '*give us a consistent framework to work with for all assessments*' and they '*are used to structure thinking and the assessment*'. These comments accord strongly with international perspectives such as those of Glasson et al (2012) and Lawrence (2013) who both state that factors and objectives also provide direction, structure and focus for the entire impact assessment process. Interviewees' also echoed one of the EPA's stated intentions that further to providing structure for proponent EIA document, the use of environmental factors and objectives should be '*applied consistently to all assessments*' (EPA 2013a p2).

Closely related to the matter of focusing and structuring EIAs, is transparency which is universally considered essential to good EIA practice (e.g. Sadler 1996; IAIA and IEA UK 1999). Many of the Western Australian interviewees noted an important role of the factors and objectives in providing for a more transparent EIA process. For example one interviewee saw a key role being:

'For the public to use to see what the EPA is assessing and against what the assessment is being made'

Another stated that '*there is clarity in the documentation*'. This clarity and transparency comes from the fact that the expectations of the EPA are clearly laid out for all to see and use (Bowen 1997), in regards to what needs to be addressed in an EIA (the factors), what is to be achieved or aimed for (the objectives) and consequently the level of mitigation required for impacts. Morrison-Saunders and Bailey (2000 p263) saw the use of environmental objectives in Western Australia as '*a serious attempt to make the goals of EIA clear*' that '*leads to a more transparent way of reaching the conclusion that a particular proposal is environmentally acceptable*'.

With respect to the use of factors and objectives in decision making, some responses included:

'When you are trying to decide whether you want to assess something and at what level they provide a consistent framework within which you can make that decision'.

'I use the environmental factors and objectives daily when deciding whether a proposal is likely or not likely to have a significant impact on the environment'.

While Wood (1999) and Therivel (2010) both note that objectives can be valuable aids for those making decisions which perhaps invites consideration of the approval decision stage within EIA, it was the frequency of consideration of factors and objectives by our respondents that interested us here and the implicit recognition of the many small decisions that occur throughout an EIA process. Interestingly, it was only employees of the Office of EPA and one practitioner who had previously served on the EPA who discussed decision-making in relation to the use of objectives and factors. Perhaps this is a reflection of the EPA's (2013a) intention that objectives and factors should be considered throughout the EIA process being specifically upheld within the EIA regulator work culture in Western Australia.

2.2 How valuable (useful) are environmental factors and objectives in EIA practice?

The great majority of interviewees (17 responses, 81%) reported that the environmental factors and objectives are of use or value during EIA. Most (11 responses, 52%) indicated that they provide more certainty and a more consistent, systematic, comprehensible and legally defensible approach. These key values are also echoed internationally (e.g. Donnelly et al 2006b, Bond and Stewart 2002) with Morrison-Saunders and Bailey (2000) noting the primary reason for using objectives in EIA in Western Australia is to provide a degree of certainty for practitioners about the expected environmental performance. Similarly, an established best practice principle is that EIA '*should have clear, easily understood requirements for EIA content*' (IAIA & IEA 1999 p3). On a similar note and

closely related to previous discussion regarding 'clarity', many practitioners (8 responses, 38%) noted that factors and objectives (and the supporting guidance – EPA 2013a and EPA 2013b) are useful because they clearly spell out what the EPA are looking for in EIA's.

Further to discussion around focus previously, some interviewees (14%) identified a key reason why environmental factors and objectives are so useful is that they focus on what is important. This is reflected in the EPA's (2013a p5) statement that the application of factors and objectives '*focuses the assessment on the impacts... likely to be significant*'. Internationally Sadler (1996) also identified focus, through the use of explicit goals and objectives as an important principle for effective EIA.

A small group of practitioners (19%) identified value of environmental factors and objectives in providing a starting point for conversations, that they allow communication to take place between all stakeholders as the factors and objectives provide a 'common lingo'. Similarly a related rationale for Gao et al (2013 p121) is to communicate in a '*more condensed and simple form*' so as to be '*more relevant for the public and policy- and decision-makers*' and to '*provide an arena for involvement, debate and deliberation*'.

2.3 What are the issues emerging from the application of environmental factors and objectives?

The Western Australian practitioners identified several concerns with the use of environmental factors and objectives such as: 1) the grouping of factors and seemingly overlap between some factors, 2) deciding which issues or impacts fit under which factor, and 3) there still being a level of judgement and subjectivity involved. It was originally acknowledged by Bowen (1997) that there is a degree of judgment required in the application of some objectives. Interestingly only seven respondents (33%) raised issues in response to this question, implying that most are satisfied with the current status.

Perhaps unsurprisingly, the two most common issues (Table 1) raised by practitioners were:

- that it is challenging to get a consistent understanding of how to meet the objectives, in terms of what represents meeting the objectives and what needs to be demonstrated to show an objective has been met; and
- that it can be challenging to define and determine the scale and significance of an impact on a factor.

This reiterates the subjective nature of factors and objectives previously. An examination of environmental reports in the EU by Donnelly et al (2008) noted that due to the aspirational nature of some objectives, they may not be capable of being monitored, which was '*confirmed by an evident difficulty in developing linked targets and indicators from the objective*' (p397). This resonates with Western Australian practitioner calls for more guidance on how to meet objectives (Table 1), in particular providing specific measurable targets and indicators that can be used to show an objective has been met.

Interestingly, the issue of how complex, multi-factor impacts and cumulative impacts are going to be handled and reported using environmental factors and objectives was raised by only two practitioners (both senior consultants). Previously Morrison-Saunders and Bailey (2000 p270) identified the risk of being reductionist as a potential weakness with environmental factors and objectives in Western Australia '*that, by breaking each proposal down into discrete parts ...it may not adequately represent overall environmental functions*' so that '*it would be possible for each environmental factor to meet the minimum requirements of the EPA's environmental objectives but for the cumulative effect of all of the proposal impacts...to have unacceptable environmental consequences*'. Similarly, Donnelly et al (2006a p154) maintain that '*objectives, targets and indicators should not be considered in isolation for a particular environmental receptor due to the*

potential influence of environmental receptors on each other'. To put it another way Reed et al, (2006 p412) stated that *'in addition to being objective and usable, indicators need to be holistic.'*

Several practitioners raised the issue of including the community in impact assessment, specifically the need to engage with stakeholders to identify the factors and objectives relevant to a project in order to manage perception and potential conflict as an important consideration. It should be noted that this is not always common practice in Western Australia. In contrast, Gao et al (2013 p127) write that objectives can be a useful tool to *'facilitate communication in terms of information transfer, consensus building and goal setting'*, which is crucial to successful community engagement. Glasson et al (2012) also reflect on the importance of engaging with multiple stakeholders early in the EIA process, and in the context of the sustainability appraisal process employed in England, it has been normal practice to engage stakeholders around the initial selection of objectives and indicators (Therivel 2010). This is an important point of difference in the Western Australian practice in that a fixed (and comparatively short) list of environmental factors and objectives are consulted for every EIA undertaken. Regarding public perception and engagement, one practitioner wrote:

'For projects assessed...the public will want to see that all issues have been addressed, and nothing has been missed. Therefore there needs to be adequate explanation and justification...for why some factors are considered key factors, and others are non-key factors (and therefore do not require detailed investigation). There is also the issue of what are the real key risks for a project and what the community perceives as key risks. The EPA may agree that a certain factor is not a key factor (based on scientific evidence), however, the community may still feel that it is a key factor and therefore warrants detailed investigation'

This concern is also shared by Wood et al (2006) who note that different stakeholders have different objectives and expectations of the EIA process due to their differing values and perspectives and Sippe (1999 p82) who suggests the *'need to ensure that factors likely to be of public interest are addressed even if technically it may not be necessary'*. In a Canadian case study comparing results of two scoping sessions (one technical and one community-oriented), Orenstein et al (2010) noted that not only did the community identify different issues of concern but the way in which the issues were grouped were also different when compared to those issues identified in the technical session. As a result, the factors addressed in the final impact assessment were changed to address the concerns of the community.

2.4 How might EIA practice be enhanced with respect to environmental factors and objectives?

Three main suggestions for enhancing EIA with respect to environmental factors and objectives were put forward by practitioners in Western Australia (Table 1).

Firstly, the most frequent suggestion (7 responses, 33%) was for more guidance for specific factors and for criteria and standards to be developed for certain factors (understanding that not all factors can be quantified). Although guidance material is useful and helps to improve practice as noted by Waldeck et al (2003) we would however speculate that more guidance may not be needed; in fact a reduction in the number of guidance documents is desirable. In response to practitioner suggestions, Waldeck et al (2003) recommended synthesising guidance materials to provide the 'core components' of the 31 EIA process guidance documents identified at that time. Currently there are more than 45 EIA guidance documents on the EPA website (<http://www.epa.wa.gov.au>) and a page dedicated to the 17 environmental factors has links to 71 technical and guidance documents intended to help practitioners to understand the expectations to be met and how to go about doing so. We contend that this must be daunting for a newcomer to the EIA system in Western Australia trying to 'learn the ropes'. We would prefer to see a streamlining of EIA guidance that reflects the streamlined nature of the EPA's list of objectives and factors in the first instance. Returning to the

perspectives of our practitioners, we can only speculate that the increase in number of EIA guidance materials produced by the EPA over the past decade has perhaps normalised practitioners to be passive recipients of top down advice. Although some consultation around the environmental factors and objectives used in Western Australia does take place (as evidenced in the one year review of EPA2013a currently underway), it is fair to say that the EPA approach conforms with the 'expert-led' and 'top-down' approach identified by Reed et al (2006) and Gao et al (2014) rather than the '*bottom-up approach which gives more discretion to practitioners*' (Gao et al 2014 p22). Both Reed et al (2006) and Donnelly et al (2006) identify participatory stakeholder-based approaches as being effective for the development of objectives, targets and indicators. Likewise, we would prefer to see practitioners in Western Australia assume greater responsibility for creatively and effectively applying factors and objectives in EIA practice, rather than looking solely to regulator guidance.

One practitioner suggested it would be useful to have examples produced by the EPA of the types of impacts that meet (acceptable) and do not meet (unacceptable) each objective, writing:

'the EPA could indicate for each factor the scale of impact they (the EPA) consider is unacceptable based on both past precedent and sound reasoning'.

In a bulletin published over two decades ago the EPA (1992) summarised their position on environmental factors commonly addressed in EIAs around that time and provided examples of the types of impacts that are acceptable and unacceptable and suggestions for management. This kind of attempt to learn lessons from previous EPA assessments would appear to mesh with the interviewee comment.

Five interviewees (24%) identified a need to improve knowledge and data sharing between proponents, consultants, the government and the public. For example one practitioner commented:

'There is so much information out there in industry... Knowledge and information sharing needs to be improved...The more science that can be out there the better'

The value of shared EIA knowledge is discussed in Therivel (2010) and Sanchez and Morrison-Saunders (2011) who note that environmental information should be available for use by others for other impact assessments.

Lastly, several practitioners (4 responses, 19%) feel that EIA practice in Western Australia could be enhanced from a procedural point of view through appropriate application of environmental factors and objectives in practice. It's possible that the underlying problem is reliance on a standardised list for all types of projects across all industries/sectors. For example, Ramos et al (2007 p412) stated that: '*it is hard to imagine that one standard indicator framework will be used by all the users that share the same objectives*' and that '*a single framework is probably insufficient to represent all the different environmental and sustainability scenarios*' (p414). Similarly, Gao et al (2014 p25) note that '*the different requirements of different groups of users create a challenge when designing indicators (objectives)*'. To be truly effective, a clear mechanism for translating the generic list of factors and objectives into project-based goals and action is needed - whether this is undertaken by proponents and their consultants or comes from the EPA (or combination of both) is something we leave open but suggest is worthy of debate in a Western Australian context in order to advance current practice.

3. Conclusion

In this paper we set out to understand practitioner perspectives on the utility of environmental factors and objectives in EIA practice through interviews with Western Australian EIA practitioners and comparison with published literature. It serves as a timely reminder to practitioners in Western Australia and internationally alike as to why and how environmental factors and objectives are used. It is evident that that there is a great deal of value in using factors and objectives such as clear focus,

structure and communication for EIA, all of which help to understand which issues are significant and to assist with decision-making throughout the process. The selection and application of factors and objectives is inherently subjective and risks being reductionist. Encouraging consultative approaches to their use, rather than reliance on more regulator guidance alone, would appear to offer the best way to enhance future practice.

Overall there appears to be a high level of match between international literature and Western Australian practitioner perspectives regarding the use of environmental factors and objectives. We believe the results recognise the continuing value of factors and objectives for EIA practice.

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