ESTABLISHING A SINGLE METHOD FOR ASCRIBING IMPACT SIGNIFICANCE IN ENVIRONMENTAL ASSESSMENT IN SOUTH AFRICA

SE SOLUTIONS
Advancing Environmental Sustainability

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Date: 9 September 2024
Rev: 00 (Draft for public review)

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1. FOREWORD

At the 2015 IAIAsa Conference, I had a lot to say about a Good Practice Manual (GPM) but never delivered on that promise. There were several reasons for not doing so mostly related to the proverbial 80:20 principle where the last 20% of a document takes 80% of the effort. I also struggled to manage my depression from the end of that year for about a 2,5-year period which robbed me of my self-confidence[1]. It just proved easier not to send anything out. Since that time, I had the great pleasure of mentoring Sibusiswe Dumakude (I may have learned more from her than she learned from me) and at a workshop where we were bewailing the state of EIA in South Africa, she asked an exceedingly simple but difficult question, 'if you're not happy with it why do you not change it?'

At this year's highly successful IAIAsa Conference I asked Dr Dee Fischer on why almost 30 years into regulated EIA in South Africa, we still do not have a single, accepted method of ascribing impact significance. Dee agreed that it was a problem but later challenged me to present a case to the DFFE. Reflecting on all the above (on my way home from the conference) I have decided that we as EAPs must take the lead in coming up with a method ourselves and I have taken the liberty here of running such a process. I have no specific credentials for doing so but if nothing else can put a first version on the table for review and comment. I will collate all comments I receive and will then present the modified method to the DFFE for their endorsement/support. I do not seek the perfect method - simply to improve on what we have currently, and then to continue improving the method as we learn from its use. I really hope that you will support me in this process and look forward to your comments.

Sean O'Beirne
September 2024

[1] I do not seek sympathy I just believe strongly in speaking about my mental health openly so those who suffer in silence can know that they are not alone.

2. INTRODUCTION

Mark Wood of Mark Wood Consulting, an experienced and well-respected EAP, believed that in all circumstances requiring Environmental Impact Assessment (EIA) there would be winners and there would be losers. EAPs are responsible for conveying to Competent Authorities (Cas) who wins and who loses given a particular application. The role of significance ratings in EIA is to reflect the nature and the magnitude of those wins and losses.

The method proposed here recognises the requirements stipulated in the EIA regulations and in no way intends to disrespect or ignore the regulations. Janice Tooley, an awesome combination of trained scientist, EAP and then environmental lawyer, frequently and correctly utters the refrain 'it must comply with the law'. Also, there is no critique of current practice in this document, bar reference to a few methods that are highly problematic. The intention is to keep this method simple so that the review and ultimately application (if that point is reached) is not unnecessarily time consuming nor taxing. So here goes!

3. THINGS THAT SHOULD NOT BE DONE IN ASCRIBING IMPACT SIGNIFCANCE

3.1 Who's accountable?

It is not for specialists to use their own significance rating systems but for the EAP to use a single system across all specialist studies. So-called 'integration workshops' that serve to provide a consolidated view of different specialist findings are not always effective and in their own right can inadvertently skew the findings where a particular specialist is dominant. EAPs are accountable for integrating the specialist findings and that means that the EAP must define the method to be used by the specialist and not the other way round. This means of course that the significance rating system must be usable by all specialists and that will be dealt with later.

3.2 Do not do the math!

Significance ratings cannot be mathematically derived. Calculations are simply put, invalid. When numbers are used to represent categories, arithmetic cannot be used on those numbers. Even were arithmetic to be a valid approach, the product (number) has no meaning on its own. The significance rating must be argued in the EIR or BAR and the underpinning logic written up so that readers can understand how it was derived.

3.3 With mitigation….

Simply declaring that 'mitigation' will reduce significance is indefensible. How the mitigation will reduce significance must be clearly detailed in the argument. The application of mitigation also does not have to result in a reduction in significance necessarily but can still be advanced as required. Again, the principle is one of making the mitigation argument compelling to the reader so that the logic can be understood and critiqued.

4. IMPORTANT CONCEPTS/DEFINITIONS

4.1 What is an impact?

Interestingly, the EIA regulations do not contain a definition for 'impact'. There is a definition for significant impacts but it is too broad to be used effectively to define what is meant by 'impact'. The ISO 14001 Environmental Management System standard, however, defines 'impacts' as *changes* to the receiving environment brought about by the activity in question[2]. Understanding impacts as 'changes to the receiving environment' is conceptually elegant and powerful in defining impact significance.

[2] There is more to it than that, but it is described here in its simplest form.

4.2 <u>Consequences</u>

Once *changes* to the receiving environment have been identified and characterised it is necessary to ask the proverbial 'so what?' question. Dr Peter Ashton formerly CSIR but now retired, had a gift for expressing concepts in a way that they were never forgotten. Presenting a seemingly well-thought through argument to Pete and having him respond with 'so what?' was a clear statement that the argument had indeed not gone as far is it needed to[3]. In ascribing impact significance it is the *consequences* of the changes to the environment that need to be presented. Ascribing significance is therefore an articulation of the consequence of the impact rather than the impact itself.

4.3 <u>Inherent risk</u>

EIA is a predictive process meaning that the EAP/specialist needs to think about both what *could* happen but also what is *likely* to happen given the activity in question. What ***could*** happen is expressed as ***inherent risk***. For example, if there will be emissions of SO_2 from a proposed activity, then adverse human health effects is an inherent risk. Expressing inherent risk is important in significance ratings to respect the concerns of stakeholders in public participation, who are fully entitled to raise concerns about what *could* happen if an activity is authorised.

4.4 <u>Residual risk</u>

It is then for the EAP/specialist to ascertain what is ***likely*** to happen given the specific circumstances of the activity and the characteristics of the receiving environment. What is likely to happen (in the specialist's opinion) is expressed as ***residual risk***. Residual risk is what must be accepted if the application is to be approved. Stated differently, what will have to be 'lived with' if the activity goes ahead? The competent authority must decide on the application based on the residual risks and how these reflect who wins and who loses.

4.5 <u>Likelihood</u>

The regulations call for 'probability' to be used in defining significance. Johan Nel, previously of the CEM at NWU argues compellingly, that 'likelihood' is a preferable term as 'probability' implies a solid statistical foundation. In most if not all instances, the probability of a given consequence is going to be expressed qualitatively rather than quantitatively in an EIA, and likelihood better articulates the qualitative nature of the assessment. One way or another, expressing the residual risk of an inherent risk requires an articulation of probability (which for significance ratings in EIA is then expressed as 'likelihood').

5. MAKING IT HAPPEN

5.1 <u>Defining consequences</u>

The consequences of the changes in the receiving environment because of a given development proposal is the crux of significance ratings. The reason that specialists should not be left to their own devices is because specialists tend to 'stack' their assessment findings ***within*** their specialist domain. For example, a noise[4] specialist may assess a noise impact as being of high significance within the noise specialist domain, but how would that compare to cancer risk from atmospheric emissions? Each specialist must present their findings against a single, EIA-wide hierarchy of potential consequences. A preliminary list of such consequences is given in Table 1.

[3] Another wonderful 'Ashtonism' is 'grunting around in the undergrowth'. The term was meant to refer to people who did not know what they were doing but Annarie Boer formerly of SE Solutions now with the Western Australian EPA, used the term to describe camping.

[4] For the record I have nothing against noise specialists.

Table 1: The hierarchy of potential consequences of changes in the receiving environment (impacts). These consequences are expressed as *inherent* risks or benefits (viz. what *could* happen) because of the impacts.

<table>
<tr><th></th><th>Environmental Cost</th><th>Rating</th></tr>
<tr><td rowspan="11">Inherent risk/benefit</td><td>Human health – morbidity / mortality, loss of threatened species population(s), loss of strategic water source potential or sequestered carbon stocks</td><td>High</td></tr>
<tr><td>Material reductions in threatened or endemic species populations or habitat, loss of livelihoods, individual economic loss</td><td>Moderate-high</td></tr>
<tr><td>Material reductions or degradation of environmental quality – air, soil, water. Loss of habitat, loss of heritage, amenity</td><td>Moderate</td></tr>
<tr><td>Nuisance</td><td>Moderate-low</td></tr>
<tr><td>Negative change – with no other consequences</td><td>Low</td></tr>
<tr><td>Environmental Benefits</td><td></td></tr>
<tr><td>Net improvement in human welfare or threatened species habitat</td><td>Moderate – high</td></tr>
<tr><td>Improved environmental quality – air, soil, water. Improved individual livelihoods</td><td>Moderate</td></tr>
<tr><td>Economic Development but no tangible environmental benefit or impact</td><td>Moderate-low</td></tr>
<tr><td>Positive change – with no other consequences</td><td>Low</td></tr>
</table>

Note that there is no ‘high’ rating for benefits. This is to reflect that there are certain environmental costs that are intolerable regardless of the benefit they bring and these costs cannot be ‘traded off’. Defining levels of acceptable change (LAC) is the holy grail of significance because if LACs are known (which they seldom are) then such LACs provide the benchmark of what can be approved and what not.

There is also no scientific way to ‘match’ the categories (viz. a moderate cost being equivalent to a moderate benefit). In a later section of this document, the importance of cost-benefit analysis to decision-making is detailed but unfortunately cannot readily be done with qualitative findings. The above table is qualitative at best but is hoped that over time the table can be refined and additional characteristics added to each of the categories. The inputs of Dr Ian Little (EWT) and his team on the draft consequences table are acknowledged with gratitude.

The importance of the consequences table is for all EAPs to use it. The consequences table is not perfect (and may never be) but there will be greater consistency in how impact significance is presented and debated in the EIA process if everyone uses the same method.

5.2 Likelihood (probability)

The specialist assessment must include the likelihood of the consequences as a function of the scale of the impact and the sensitivity of the affected environment. Likelihood defines the difference between an inherent risk (what *could* happen) and a residual risk (what is *likely* to happen).

This is where the significance categories in the regulations can (and must) be used to argue the likelihood of the consequence viz extent, duration, intensity and so forth. Likelihood categories are proposed in Table 2. Here again it is simply a question of all EAPs using the same likelihood categories rather than necessarily having the perfect expression of likelihood.

Table 2: Likelihood categories and definitions in ascribing impact significance.

Likelihood	Definitions
Highly unlikely	The possibility of the consequence occurring is negligible
Unlikely but possible	The possibility of the consequence occurring is low but cannot be discounted entirely
Likely	The consequence may not occur but a balance of probability suggests it will
Highly likely	The consequence may still not occur but it is most likely that it will
Definite	The consequence will definitely occur

5.3 Expressing impact significance

Significance is then expressed as the residual risk of the consequence. A simple matrix is used to combine likelihood and consequence (**Table 3**). At the risk of sounding like a broken record, it is unlikely that this matrix will ever be perfect but the benefit will come from everyone using the same matrix.

Current practise suggests that EAPs do not always include a fatal flaw category in their significance rating approach. It is argued here though, that an EIA must have an even chance of finding against the proposed development and not having a fatal flaw category forecloses such a finding. That said, it hopefully stands to reason that Screening must become much more effective in the EIA process so that fatal flaws are identified early in the process.

Table 3: Residual risk matrix combining likelihood and consequence.

		Residual risk				
Consequence	High	Moderate	High	High	Fatally flawed	
	Moderate-high	Low	Moderate	High	High	High
	Moderate	Low	Moderate	Moderate	Moderate	Moderate
	Moderate-low	Low	Low	Low	Low	Moderate
	Low	Low	Low	Low	Low	Low
		Highly unlikely	Unlikely but possible	Likely	Highly likely	Definite
		Likelihood				

5.4 What do the significance categories mean for decision-making ?

The final step in the process is conveying what the significance categories mean or at least should mean, for decision-making. The decision-making implications of the significance categories are presented in Table 4. It is obviously not expected that Competent Authorities (CAs) are suddenly going to adopt this decision-making criteria but it is important that it is clear as to how an EAP has advanced residual risk in association with anticipated decisions. Part of why the current significance rating approach is problematic is that the decision-making implications of the significance ratings are not always clear.

6. REASONABLE AND RATIONAL DECISION-MAKING

6.1 Overview

Authority decision-making in South Africa is required to be reasonable, rational and procedurally fair. For the most part though how CA's make decisions is rather opaque and this lack of understanding is potentially deeply prejudicial to applicants and to EAPs. If a CA has an internal policy, for example, that says an impact of high significance means a negative decision[5] then such a policy must be clearly communicated to EAPs.

Table 4: Decision-making implications of the different significance categories.

Rating	Implication for decision-making
Fatally flawed	The project cannot be authorised
High	The project can be authorised but with strict conditions and high level of compliance and enforcement
Moderate	The project can be authorised but conditions and routine inspections
Low	The project can be autorised with a low risk of environmental degradation

This transparency is not so that EAPs can fudge authorisations by picking the right significance ratings but simply so that the significance ratings can be aligned. An EAP who has a fatal flaw significance category will then understand that the CA only needs to see an impact of high significance to deny an application and will align the significance ratings accordingly. Another example is the offsets guideline stipulating that offsets are required where significance ratings are medium to high, but there is no calibration of what medium and high actually mean.

Nigel Roussow, formerly of TCTA and now with MAERSK in The Netherlands argues that significance can only be properly attributed where LAC are defined. There is full agreement with that assertion but that does not mean that nothing can be done in the interim. At the same time if LAC is defined, how are user rights allocated to the development opportunities within the LAC or is it simply first come - first served? A conceptual model of reasonable and rational decision-making is also needed so that there is consistency in how decisions are made.

6.2 Cost benefit analysis

In deciding a project, decision-makers hopefully apply cost-benefit principles. An environmental authorisation means that the overall benefits of the project were deemed by decision-makers to outweigh the overall environmental costs borne by communities (especially those who only experience negative impacts with no benefits). This cost benefit principle is illustrated conceptually in Figure 1 as the basis for reasonable and rational decision-making.

In the figure a 45° line would represent a circumstance where the costs are equivalent to the benefits. A project that plots above the line would mean societal benefits outweigh the environmental costs. A project that plots below the line means that the environmental costs outweigh the societal benefits.

Reasonable (sustainability lead) decision-making would see projects where societal benefits outweigh environmental costs approved and projects where environmental costs exceed societal benefits denied. For sustainability purposes though, approving a proposed project cannot simply be where societal benefits outweigh environmental costs. There is a maximum level of environmental cost that cannot be exceeded (see the high inherent risk category in Table 1).

The upper limit of the environmental costs that can be tolerated are known as Levels of Acceptable (tolerable) Change (LAC). South Africa is desperate for job creation but a project that exhausts the country's water resource even while creating a slew of jobs, is a cost that would be intolerable and entirely unsustainable regardless of the magnitude of the benefit.

[5] This is a real-life example but kept anonymous

Whereas the LAC for the environmental costs is a ceiling (an upper limit) the LAC for the societal benefits is a floor (a lower limit). Additional societal benefits are technically limitless, but no projects should be allowed to materially reduce benefits that are currently being enjoyed by society (viz. the existing or current state of benefits). Sustainable projects it can be argued are thus those where:

- Benefits outweigh costs;
- Costs do not exceed LAC; and,
- Existing benefits (the current state) are not materially reduced.

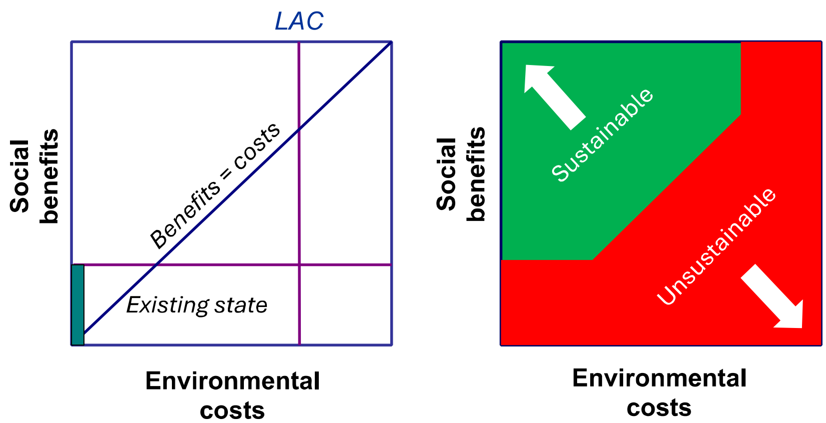

Figure 1: Conceptual presentation of reasonable and rational (sustainability lead) decision-making. The closer a project is to the upper left corner of the graph, the more sustainable.

There are different ways of putting units of measure on the axes of these graphs but these are not presented here. The decision-making model is simply to present the key principles of sustainability lead decision-making. Even if environmental cost metrics cannot be compared to societal benefit metrics directly, the model shows that where projects compete for the same resources, that the project with the greatest societal benefit return is the one that should be allocated the right to use those resources.