Regulators' perceptions of environmental impact assessment (EIA) benefits in a sustainable development context

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Abstract

The costs of conducting Environmental Impact Assessment (EIA) are well known. Yet the benefits of EIA are much more intangible, leading to a situation where some question its value as the tool of choice for informing decision makers of the sustainability consequences of their actions. Exponents of EIA have thus called for more research on the benefits of EIA in order to provide better evidence on its costs versus benefits, and therefore its value as a decision-making tool. This paper contributes to this evidence by exploring the perceived potential benefits and perceived realised benefits of EIA from a regulators' perspective in the context of sustainable development. Using South Africa as a case study, one third of all the officials responsible for EIA review and decision-making (referred to in this paper as the "regulator") were surveyed to identify their perceptions of the benefits of EIA, and their ideas on how to bridge the gap between potential benefits and realised benefits. The paper contributes suggestions for the analysis of benefits in a sustainable development context, and identifies some additional benefits currently missing from the literature. In a South African context, the key potential and realised benefits as perceived by regulators are the protection of biodiversity, public participation, access to information, mitigation of environmental impacts, and legal compliance and enforcement.

Keywords: benefits of EIA; sustainable development; perceptions; regulators; quadruple bottom line

Abbreviations

Best practicable environmental option (BPEO), compliance and enforcement (C&E), Department of Environment, Forestry and Fisheries (DEFF), Department of Mineral Resources (DMR), environmental impact assessment (EIA), environmental assessment practitioner (EAP), Environmental Assessment Practitioners Association of South Africa (EAPASA), environmental control officer (ECO), environmental management programmes (EMPrs), economic (EC), ecosystem services (ES), governance (G), National Environmental Management Act (NEMA), National Framework for Sustainable Development (NFSD), sustainable development (SD), strategically important developments (SIDs), socio-political (SP)

Highlights

- Regulators' perceptions of the benefits of EIA in South Africa are identified
- Suggestions for evaluation of EIA benefits is developed from the literature
- A quadruple bottom line conception of sustainability sets the context for the study
- There is inconsistency over the benefits that that are perceived to accrue from EIA
- Protection of biodiversity was regarded as the main potential and realised benefit

1. Introduction and background

Environmental Impact Assessment (EIA) is a process designed to support the management of actual and potential environmental impacts related to project-specific developments (Retief, 2010; *Jay et al.,* 2007; Morrison-Saunders *et al*., 2015). According to Morrison-Saunders *et al*. (2015), however, the future of EIA is threatened because proponents[1] see it as an expensive and time-consuming process. The value and benefits of EIA have also been questioned by specialists, researchers and governments (Retief, 2010; *Jay et al.,* 2007) leading Bond *et al*. (2014) to argue for the need to understand the benefits of EIA for a range of stakeholders, and for Morrison-Saunders *et al.* (2015) to call for empirical studies focusing on the benefits of EIA.

The benefits resulting from the application of a process are dependent on the context within which the evaluation takes place. Glasson and Therivel (2019) present several different purposes for EIA, including it being an aid to decision-making; an aid to the formulation of development actions; a vehicle for stakeholder engagement; and an instrument for sustainable development. In this research, we focus on the latter given that it ties in with Government rhetoric on the goals of EIA in many jurisdictions (Sheate, 2009; Morrison-Saunders & Retief, 2012; Glasson and Therivel, 2019). Also, the Rio Declaration on Environment and Development in 1992 determined, in its Principle 17, that EIA should be the tool of choice for achieving sustainable development (Devuyst, 2000).

Of particular relevance in explorations of benefits are the differences between *perceived* benefits and *actual* benefits. In the medical profession, patients make decisions (i.e. provide informed consent) on operations based on the benefits they perceive, with a greater propensity to accept risk associated with higher degrees of perceived benefits (Lloyd *et al.*, 2001). And the relationship between willingness to accept risk, and levels of perceived benefits is also seen in the environmental field with Williams *et al.* (1999) finding that economic benefit abated the perception of risk. In the context of sustainable development, the actual impacts and benefits are clearly important in terms of the ability of present generations to pass on capital to future generation, and yet perceptions of benefits tend to colour judgements of the regard in which EIA is held, and underpins the threat to EIA explained above.

This research is conducted in the context of EIA as a tool for helping decision-makers to deliver sustainable development. For pragmatic reasons (that is, the opportunity to focus on a particular group of stakeholders arose), the focus is on *regulators'* perceptions on the potential and realised benefits of EIA for society, framed within the context of sustainable development in South Africa. By 'regulators', we mean officials (from provincial and national spheres of government) responsible for the review and decision-making on EIA applications. It is important to understand regulators' perceptions on the benefits of EIA, as they essentially direct the agenda for the EIA process in the country, and are ultimately responsible for making decisions on EIA applications and enforcement of the conditions of environmental authorisations. It is also important to be clear that the research identifies perceptions only. Any differences between potential and realised benefits are purely as perceived, and may not be

[1] *Proponents*, in the context of EIA, mean a person(s) intending to submit an application for environmental authorisation and is referred to as an *applicant* once such application for environmental authorisation has been submitted.

real. Nevertheless, the results provide useful insights into what regulators feel EIA should do, and what they think it does do.

The aim of this paper is thus to identify the perceptions of regulators of the potential, and realised, benefits of EIA, and also their ideas on how to bridge the gap between potential and realised benefits, where one exists.

Thus, this paper contributes to the literature by conducting the first known empirical study on the perceived benefits of EIA. It contributes to international knowledge through the development of an analytical framework (Table 1) for exploring the benefits expected from EIA in the context of sustainable development, and through the benchmarking of perceptions of the expected and realised benefits of EIA practice seen through eyes of regulators. This can provide the basis for comparative studies to establish the extent to which the findings are generalizable.

Section 2 introduces the literature on the benefits of EIA in the context of sustainability, thereby helping to make suggestions for analysis of regulator perceptions. Section 3 sets out the methods employed to gather data on regulator perceptions of the benefits of EIA, and also on the approach for analysis. Section 4 presents the results and discussion, structured using the framework developed from the literature in section 2. Finally, in our conclusions, we distil the learning from the research, both in a South African context, and the wider learning relevant to EIA in general.

2. The benefits of EIA in the context of sustainable development

This section of the paper defines the concept “benefit”, and derives the analytical framework for exploring the perceived potential, and perceived realised, benefits derived from this research. It further provides a broad overview of the known, published benefits of EIA from literature.

2.1. Defining the concept *benefit*

The term *benefit* is defined as *“an advantage or profit gained from something”* (Oxford dictionary). A few papers have been published, which focus on the benefits of EIA. As Morrison-Saunders *et al.* (2015), as well as Brown & McDonald (1995) have noted, these studies have mainly focused on EIA effectiveness and have remained largely academic, with a need for empirical data to support their findings.

2.2. Categorising benefits of EIA

The literature on the benefits of EIA is relatively sparse, with two separate approaches being identified. The first is a *managerial model*, which has been proposed by Morrison-Saunders *et al.* (2015) for the classification of the benefits of EIA for proponents. This model suggests classification of benefits into: (1) operational benefits, (2) managerial benefits, (3) strategic benefits, and (4) organisational benefits. The second is the *legislative intent model* which was considered in Garner and O'Riordan (1982) as being the expectation for the advantages delivered through the adoption of the European EIA Directive,

which include: (1) consistency and fairness, (2) early-warning as it relates to financial savings, (3) environment and development, and (4) public involvement. Whilst both of these models have value, their focus is not on the delivery of sustainable development, and therefore analyse benefits in a different contextual setting. For the purposes of categorising the perceived benefits of EIA for society reported in this paper, we have decided to use the so-called *nested-egg model* to address the sustainable development context against which this research was conducted. This model is also known as the quadruple bottom line approach to sustainable development and has recently superseded the triple bottom line representation of sustainable development, by adding a governance dimension to the traditional environmental, social and economic dimensions (Glasson and Therivel, 2019). The governance dimension focuses on the system of values, policies and institutions by which environmental, economic, and socio-political affairs are managed, through interactions within and among government, civil society and the private sector.

In this paper, given the focus on sustainable development in a South African context, we explain the nested-egg model as it is outlined in the National Framework for Sustainable Development (NFSD) (DEAT[2], 2008) although, as explained above, this is relevant in any jurisdiction as the basis for quadruple bottom line representation of sustainability.

2.2.1. The nested-egg model for categorising the benefits of EIA

The nested-egg model highlights the interdependencies between economic-, socio-political and ecosystems, which are embedded within each other and integrated through governance systems (DEAT, 2008) (Figure 1). The understanding is that each of these systems play a significant role in achieving sustainable development in South Africa.

[2] Department of Environmental Affairs and Tourism, now the Department of Environment, Forestry and Fisheries (DEFF).

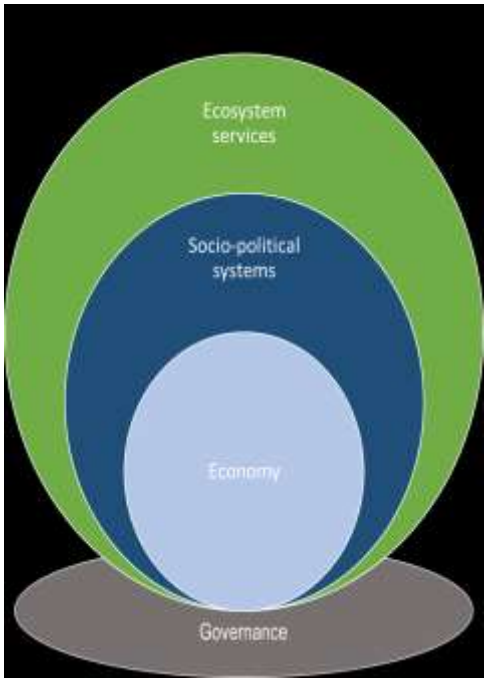

Figure 1. The nested-egg model towards sustainability (adapted from NFSD, 2008)

The NFSD (2008) has a strong focus on sustaining ecosystems and using natural resources efficiently. The framework realises that the supply of natural resources and status of ecosystem services need to be taken into account, as we pursue economic development.

Socio-political systems focus on social relationships, capacities, power-dynamics, and how resources are distributed and contested. As far as socio-political systems in the context of nested-egg model are concerned, the main aim of the NFSD (2008) is to create sustainable human settlements.

The sustainable economic development focus of the framework responds mainly to economic development and poverty eradication targets, which include, but are not limited to maximising job creation impacts, identifying appropriate 'second economy' interventions, and contributing to solving social problems. The framework however, realises that economic development should happen in the context of the sustainable use of ecosystem services.

One of the key challenges for effective governance involves the integration of environmental considerations into sectoral policy and legislation (DEAT, 2008). The NFSD identifies four areas of intervention, which include governance and integration for sustainable development, planning for sustainable development, monitoring and evaluation for sustainable development (which include compliance and enforcement monitoring), as well as policy integration.

2.3. Analytical framework for exploring the benefits of EIA in the context of sustainable development

Table 1 links the benefits of EIA cited in the literature to the quadruple bottom line categories of the nested-egg model. In doing so, it develops a framework which can be used as the basis for analysis of sustainable development benefits achieved through the practice of EIA, whether perceived or actual.

Table 1. Benefits of EIA from literature

Benefit category	Reference
Benefits related to ecosystem services	
ES1: Improves environmental *protection* and encouraging the spirt of *environmental conservation*	Weston (1995); Garner & O'Riordan (1982)
ES2: Encourages development that does *not lead to the destructive breakdown of ecosystem services* in the long term & securing ecologically sustainable development	Oosterhuis (2007); Garner & O'Riordan (1982)
ES3: Enhances *harmonious* developments with limited *aesthetic effects* and consideration of the *sense of place*	Oosterhuis (2007); Garner & O'Riordan (1982)
Refer to G1[3]: *Mitigates adverse environmental impacts*: - Decreasing environmentally damaging elements of a proposed project; - Minimising adverse effects by scaling down or redesigning a project; - Repairing, rehabilitating or restoring environments affected by a project; - Creating or acquiring environments similar to those adversely affected by developments (off-sets)	Loomis & Dziedzic (2018); Oosterhuis (2007); Baker & McLelland (2003); Wood (2003); Ortolano & Shepherd (1995)
Socio-political benefits	
SP1: Enhances socially acceptable developmental proposals *(with less social conflict, empowering marginalised individuals and groups)*	Morrison-Saunders *et al*. (2015); Klaffl *et al*. (2006); Lawrence (2003), Vanclay (2003), Barton (2002); Kakonge (1998); Gagnon (1995); Ortolano & Shepherd (1995)
SP2: Increases knowledge, environmental education and awareness of stakeholders (also referred to as "social learning")	Morrison-Saunders *et al.* (2015); O'Faircheallaigh (2010); Wood (2003); Ortolano & Shepherd (1995)
SP3: Provides for economic development improving the quality of life of affected communities	Bond *et al*. (2014); Wedin *et al*. (2013)
SP4: Provides confidence for political acceptability (*through inclusion of social, economic, land-use and other political considerations.)*	Marshall (2005)
SP5: Politically enhances the influence of government departments responsible for environmental protection	Ortolano & Shepherd (1995)
Economic benefits	
EC1: Enhances economically sustainable development *(including job and opportunity creation)*	Bond *et al*. (2014); Wedin *et al*. (2013)
EC2: Avoids unnecessary operational costs (where good project design occurs in concert with effective screening and scoping mechanisms to inform modification of design and mitigation measures)	Loomis & Dziedzic (2018); Retief & Chabalala (2009); Oosterhuis (2007); Christensen *et al*. (2005, 2003); Nielsen *et al.* (2003); Wood (2003); Kobus & Lee (1993); Garner & O'Riordan (1982)
EC3: Avoids civil/criminal liability costs *(penalties and fines)* through compliance and enforcement	Wessels *et al.* (2015); Marshall (2005)
EC4: Provides early warning for proponents: Withdrawal or modification of unsound projects	Haldorsson & Guðmundsdóttir (2006); *Wood et al.* (2006); Radnai & Mondok (2000); Ortolano & Shepherd (1995); Garner & O'Riordan (1982)
Governance	
G1: Mitigates adverse effects *(setting conditions to provide for appropriate mitigation and management measures)*	Loomis & Dziedzic (2018); Baker & McLelland (2003); Wood (2003); Ortolano & Shepherd (1995)
G2: Improves public involvement and participation	Oosterhuis (2007); Robinson & Bond (2003); Stookes (2003); Stinchcombe & Gibson (2001); Palerm (1999); Chaytor (1995); Ortolano & Shepherd (1995); Garner & O'Riordan (1982)
G3: Provides information for consistency in approach and fairness in decision-making *(by competent and commenting authorities)*	Loomis & Dziedzic (2018); Retief, *et al* (2013); Wang *et al*. (2012); Cashmore *et al*. (2004); Stinchcombe & Gibson (2001); Leknes (2000); Nooteboom (2000); Piper (2000); Wood & Jones (1997); Ortolano & Shepherd (1995); Canelas (1989); Garner & O'Riordan (1982)
G4: Provides access to information for informed contribution and decision-making (*by stakeholders such as I&APs*)	Partidario & Sheate (2013); Morgan (2012); Lastarnau *et al.* (2011); O'Faircheallaigh (2010); Hartley & Wood (2005); Hunsberger *et al*. (2005); Marshall (2005); Stinchcombe & Gibson (2001)

[3] The avoidance, minimization, restoration and off-set of environmental impacts due to mitigation measures were regarded as "governance benefits" for the purposes of this paper. Refer to G1 in Table 1.

Benefit category	Reference
G5: Monitors compliance and enforces legislation and conditions of environmental authorisations *(Improves the level of adherence to applicable regulations)*	Loomis & Dziedzic (2018), Wessels *et al*. (2015); Chanchitpricha & Bond (2013); Marshall (2005)
G6: Provides policy and institutional benefits *(Better departmental relations, cooperative governance, changes to power relations between departments, development of otherwise absent expertise)*	Loomis & Dziedzic (2018), Chanchitpricha & Bond (2013), Radnai & Mondok (2000); Ortolano & Shepherd (1995),
G7: Improves efficiency of other authorisation processes/integrated processes/parallel development *(EIA and policy/plan/programme developed alongside one other with considerable crosscutting between the processes' which allows for efficiency in processes)*	Loomis & Dziedzic (2018); Bond *et al.* (2014); Chanchitpricha & Bond (2013)
All four categories	
SD1: Pursuit of sustainable development	Morrison-Saunders & Retief (2012); Bond & Morrison-Saunders (2011); Sheate (2009); Weaver *et al*. (2008); Pope *et al.* (2004); Stinchcombe & Gibson (2001).

3. Methodology

Semi-structured questionnaires were used to gather and analyse data on the research questions, during three training sessions held in 2017 for government officials responsible for the review of, and decision-making on, EIA applications and reports (referred to as *"regulators"* in this paper). The training sessions were held in Durban (KwaZulu Natal) in July 2017, Cape Town (Western Cape) in September 2017 and Johannesburg (Gauteng) in October 2017. Two-hundred (200) participants attended the training sessions of which 197 submitted responses (98.5% response rate).

The respondents are considered to be representative of more than one third of the 561 regulators trained over a period of three years (from 2016 to 2018)[4] of the provincial and national authorities responsible for EIA review and decision-making in South Africa. Attendance of the training was compulsory and it is, therefore, assumed that the 561 officials that were trained (over the three years) are approximately representative of the government officials responsible for EIA review and decision-making in South Africa. As such, the results can be considered to be representative of practice within South Africa.

[4] EIA training was scheduled over a period of three years (2016 – 2018) for government officials responsible for EIA review and decision-making. During the three years, a total of 561 officials were trained. The respondents included in *this study* (197 respondents out of a total of 200 attendees) only represents officials who attended the training sessions scheduled in 2017. Delegates who attended training sessions scheduled in 2016 and 2018 completed questionnaires on the benefits of EIA for government and proponents, respectively. The responses of these participants do not form part of the scope of this study, but will be reported on elsewhere.

It is assumed that the 561 officials who have attended the training sessions over the three-year period are approximately representative of the government officials responsible for EIA review and decision-making in South Africa, since attendance of the training was compulsory. The exact non-attendance figures were, however, not known (e.g. people who were off work sick). The population is, therefore, assumed to be at least 561, and the authors have assumed that it is not significantly higher.

The sample size included in this study (197 respondents) is considered to be statistically representative of the population of 561 government officials who attended the training sessions, considering a 95% confidence level and a margin of error of 6% (***Note:*** *A population of 561 requires a sample size of 181 participants to be statistically representative, considering the 95% confidence level and 6% margin of error*).

The following steps were followed:

Step 1: Paper-based semi-structured questionnaires were administered to respondents on the first day of the training sessions (prior to any training taking place) to gather the uninfluenced opinions of regulators regarding their perceptions of the benefits of EIA for society. The officials were provided approximately 45 minutes to complete the questionnaire anonymously to allow sufficient time for reflection. The questionnaires posed three questions:

Research question 1: In your opinion, what are the *potential benefits* of EIA for society?

Research question 2: In your opinion, what are the *realised (achieved) benefits* of EIA for society?

Research question 3: In your opinion what must happen in order to successfully *bridge the gap* between potential and realised benefits (if gap exists)?

Step 2: Responses were collated and digitised.

Step 3: Digitised responses were imported into a software programme, *Atlas.ti*, for codification. Further refinement, grouping and categorisation were done based on the analytical framework presented in Table 1.

During the first round of data analysis, prior to further refinement, grouping and categorisation, correlations between actual and potential perceived benefits were considered. In many cases, the mention of "potential" and "realised" benefits were random, with relatively weak/insignificant correlations between categories of responses made by individuals. No further correlations were attempted after the grouping and categorisation of data.

Poor hand-writing posed a challenge during the transcription of the hand-written responses, although this was limited to only five of the 197 responses and had an impact on only a few words or phrases.

4. Analysis and discussion

Table 2 presents the responses of participants of this study divided into eighteen codes [(1) to (18)], associated with the benefits categories outlined in Table 1, where applicable.

*Table 2. The number (and percentage out of a total of 197 participants) of responses per code for each research question as it relates to the benefit categories identified in Table 1. The top ten benefits (in terms of frequency of responses) are indicated**

Reference to benefits identified from the literature (see Table 1)	Benefit categories and codes for benefits mentioned during this study	Potential Benefits	Realised Benefits	Bridging the gap
Ecosystem services (ES) benefits				
ES1: Improves environmental *protection* and encouraging the spirt of *environmental conservation*	**(1)** Protection and conservation of biodiversity and sensitive areas[1*]	**94 (48%)**	**63 (32%)**	**1 (0.5%)**
ES2: Encourages development that does *not lead to the destructive breakdown of ecosystem services* in the long term & securing ecologically sustainable development	Not explicitly mentioned by participants of this study, may be implied in (2) and (3)	-	-	-
ES3: Enhances *harmonious* developments with limited *aesthetic effects* and consideration of the *sense of place*	Not mentioned by participants of this study	-	-	-
Not explicitly mentioned in literature reviewed for this paper (Table 1)	**(2)** Resource preservation/sustainable use of resources (consumptive use)[7*]	**33 (17%)**	**17 (9%)**	-
Not explicitly mentioned in literature reviewed for this paper (Table 1)	**(3)** Prevention of pollution	**19 (10%)**	**11 (6%)**	-
Socio-political (SP) benefits				
SP1: Enhances socially acceptable developmental proposals *(with less social conflict)*	Not mentioned by participants of this study	-	-	-
SP2: Increases knowledge, environmental education and awareness of stakeholders	**(4)** Improved knowledge, capacity and awareness of environmental issues and the EIA process[6*]	**45 (23%)**	**40 (20%)**	**75 (38%)**
SP3: Provides for economic development improving the quality of life of affected communities	**(5)** Improved living conditions because of new developments and infrastructure	**11 (6%)**	**8 (4%)**	-
SP4: Provides confidence for political acceptability (*through inclusion of social, economic, land-use and other political considerations.)*	Not mentioned by participants of this study	-	-	-
SP5: Politically enhances the influence of government departments responsible for environmental protection	Not mentioned by participants of this study	-	-	-
Economic (EC) benefits				
EC 1: Enhances economically sustainable development *(including job and opportunity creation)*	**(6)** Job creation, employment of local labour, development of skills (larger scale)[8*]	**32 (16%)**	**22 (11%)**	**2 1%**
	(7) Sustainable economic development[10*]	**21 (11%)**	**13 (7%)**	-
Not explicitly mentioned in literature reviewed for this paper (Table 1)	**(8)** EIA-related employment opportunities (EAPs, regulator, specialist)	**10 (5%)**	**13 (7%)**	-

Reference to benefits identified from the literature (see Table 1)	Benefit categories and codes for benefits mentioned during this study	Potential Benefits	Realised Benefits	Bridging the gap
EC 2: Avoids unnecessary operational costs (where good project design occurs in concert with effective screening and scoping mechanisms to inform modification of design and mitigation measures)	**(9)** Financial savings in the long term (BPEO, proper structures, etc.) because of proper planning and impact assessment	**8 (4%)**	**6 (3%)**	**-**
EC 3: Avoids civil/criminal liability costs *(penalties and fines)* through compliance and enforcement	Not explicitly mentioned by participants of this study as an economic benefit, but regarded as a governance benefit [Refer to (16)].	**-**	**-**	**-**
EC 4: Provides early warning for proponents: Withdrawal or modification of unsound projects	**(10)** Financial viability of developments are determined during the EIA process	**3 (2%)**	**-**	**-**
Governance (G) benefits				
G1: Mitigates adverse effects *(identifying alternatives and setting conditions to provide for appropriate mitigation and management measures)*	**(11)** Assessment, management and mitigation of negative and positive impacts[2*]	**90 (46%)**	**57 (29%)**	**66 (33%)**
	(12) Identification of alternatives	**4 (2%)**	**4 (2%)**	**-**
G2: Improves public involvement and participation	**(13)** Public participation and stakeholder involvement processes[3*]	**62 (31%)**	**50 (25%)**	**53 (27%)**
G3: Provides information for consistency in approach and fairness in decision-making *(by competent and commenting authorities)*	Not mentioned by participants of this study Participants focused more on information provided to I&APs (See (14) below)	**-**	**-**	**-**
G4: Provides information for informed contribution and decision-making (*by stakeholders such as I&APs*)	**(14)** Involvement in informed and transparent decision-making[9*]	**30 (15%)**	**23 (12%)**	**23 (12%)**
	(15) Access to information and communication	**6 (3%)**	**4 (2%)**	**7 (4%)**
G5: Monitors compliance and enforces legislation and conditions of environmental authorisations *(Improves the level of adherence to applicable regulations)*	**(16)** Enforcement of legislation and requirements (legal compliance)	**16 (8%)**	**21 (11%)**	**75 (38%)**
G6: Provides for policy and institutional benefits *(Better departmental relations, cooperative governance, changes to power relations between departments, development of otherwise absent expertise)*	Not mentioned by participants of this study	**-**	**-**	**-**
G7: Improves efficiency of other authorisation processes/integrated processes/parallel development *(EIA and policy/plan/programme developed alongside one other with considerable crosscutting between the processes' which allows for efficiency in processes)*	Not mentioned by participants of this study	**-**	**-**	**-**
Benefits related to all four systems (Sustainable development) (SD)				
SD1: Pursuit of sustainable development	**(17)** Promotes sustainable development[5*]	**58 (29%)**	**24 (12%)**	**25 (13%)**
Not explicitly mentioned in literature reviewed for this paper (Table 1), applicable to the South African Constitutional context	**(18)** Constitutional environmental right (including health, wellbeing and safety)[4*]	**60 (30%)**	**33 (17%)**	**-**

4.1. Perceived benefits related to ecosystem services

The respondents perceived the ***protection and conservation of biodiversity and sensitive areas*** [code (1)] as the main potential (48%) and realised benefit (32%) of EIA for society. Specific terminology used included: *"environmental protection" and "conservation"* (with reference to wetlands, water resources, land, biodiversity, and cultural resources, such as graves), *"avoidance of sensitive areas"*, "*prevention of degradation"* and *"maintaining a natural state of environment"*. Mention was made of environmental protection from an ecocentric (environmental conservation point of view with reference to *"conservation"* of *"protected areas" and "endangered species"*) and from an anthropocentric point of view (with reference to "*protection of the environment for current and future generations"*).

Resource preservation and sustainable resource use [code (2)] was the seventh most highly cited potential (17%) and/or realised (9%) benefit. Responses typically related to consumptive use of resources (which mainly referred to *"preservation" and "limiting consumption"* of resources), such as use of water, non-renewable resources and energy. Reference was also made to the protection of natural resources from depletion in the context of securing *"economic and social growth".*

Prevention of pollution [code (3)] was regarded as a potential benefit by fewer of the respondents, although there was reference to *prevention of "air", "water"* and *"land" "pollution"* and *"contamination"*.

No specific mention was made of means to address the gaps between potential and realised benefits related to resource use and preservation, nor to pollution prevention.

The ecosystem services benefits mentioned by the respondents tallies, in general, with views of other authors internationally (Ortolano & Shepherd, 1995; Weston, 1995; Garner & O'Riordan, 1982) (see Table 1). Ecosystem services categories mentioned in literature, but not mentioned by participants of this study included *encouraging development that does not lead to the destructive breakdown of ecosystem services in the long term, and securing ecologically sustainable development* (ES2, Table 1), as well as *enhancing harmonious developments with limited aesthetic effects and consideration of the sense of place* (ES3, Table 1). None of the respondents mentioned ES3 as a benefit of EIA, while ES2 may be have been implied in response codes (2) and (3) of this study, which referred to resource preservation/sustainable use of resources (2) and the prevention of pollution (3). Thus, response codes (2) and (3) could either be regarded as benefit categories that are not explicitly mentioned in the reviewed literature (Table 1) or as sub-categories of ES2.

4.2. Perceived socio-political benefits

Promoting ***improved knowledge, capacity and awareness of environmental issues and the EIA process*** [code (4)] was the sixth most frequently cited potential benefit (23%) and/or realised benefit (20%). Morrison-Saunders *et al.* (2015) and Wood (2003) also mention that increased knowledge, environmental education and awareness of stakeholders are (indirect) benefits of the EIA process. The responses from our participants pointed out that EIA was perceived as a mechanism to

make society aware of environmental issues in general, and more specifically, also the EIA process, with reference to *"improved knowledge and capacity building", "increased environmental awareness", "knowledge about proposed developments and its impacts"* and *"awareness of the EIA process*". This category led to the joint highest frequency of responses on ideas on bridging the gap, although these tended to be rather vague, including *increased efforts to improve awareness, knowledge and capacity building amongst members of society*.

Marara *et al.* (2011) mentioned the importance of public awareness of the EIA process as one of the key factors in delivering effective EIA, and Appiah-Opoku (2001) noted that a lack of environmental awareness and knowledge is a significant constraint to EIA practice in Africa, and Khosravi *et al.* (2019) found the same in Iran. With reference to the present research, mention of increased awareness and knowledge were mostly directed towards the public in general (society), however, reference was also made to increasing the knowledge and capacity of regulators and EAPs (as discussed in the governance-related benefit category in Section 4.4).

A few participants perceived the ***promotion of improved living conditions*** *"because of new developments and infrastructure"* [code (5)] as a potential benefit for society. These respondents argued that EIA provides a mechanism for the development of *"new beneficial projects and infrastructure related to developments"* (such as roads, housing, schools, hospitals, and other infrastructure), which *"improves the living conditions of society"*. They point out that "*the EIA process may lead to the development of associated, beneficial infrastructure (as part of social trade-offs) which may not otherwise have been developed."* They also mentioned that the EIA process requires that developments happen under *"controlled conditions"* to ensure "*lawful and well-designed/managed infrastructure".* No mechanisms were suggested to address the gap between potential and realised benefits related to this code.

When comparing the statements from our respondents to the socio-political benefits mentioned in literature and summarised in Table 1, it is of note that no participants explicitly mentioned the benefits of EIA as it relates to enhancing *socially acceptable developmental proposals with less social conflict* (SP1, Table 1) [as mentioned by Morrison-Saunders *et al*. (2015); Klaffl *et al.* (2006); Lawrence (2003), Petts, (2003) and Ortolano & Shepherd (1995)] nor the benefits of EIA contributing to *providing confidence in developmental proposals to enhance political acceptability* (SP4, Table 1) (as noted by Marshall, 2005) and *politically enhancing the influence of government departments responsible for environmental protection* (SP5, Table 1) *(*as mentioned by Ortolano & Shepherd, 1995). Kakonge (1998) has outlined that EIA is a potentially powerful management tool that has settled environmental conflicts in western and southern African countries, when applied properly. He specifically mentioned that EIA has the potential to address possible areas of conflict such as (i) depletion and competition for land and water resources, (ii) inadequate or corrupted political-legal and enforcement frameworks, (iii) lack of coordination and adjudication mechanisms between countries; and (iv) inequitable allocation and use of resources. Kakonge, however, mentions that EIA can only be a tool to address social conflict and political acceptability of projects if it contains the elements of "good governance", which includes the provision of information and transparency, accountability, responsibility, and public participation.

4.3. Perceived economic benefits

The economic benefits of EIA, reported in literature (Table 1) focus mainly on cost-savings by proponents (Loomis & Dziedzic, 2018; Retief & Chabalala, 2009; Oosterhuis, 2007; Christensen *et al*., 2005; 2003; Nielsen *et al*., 2003; Wood, 2003; Kobus & Lee, 1993; Garner & O'Riordan, 1982).

A proportion of respondents indicated that EIA has the potential benefit (16%) of ***creating jobs and providing for the employment of local labour, as well as the development of skills,*** [code (6)] while fewer (11%) perceived this benefit as being realised. The responses indicated the perception that the EIA process generally focuses on *"job creation"* as one of the *"positive contributions"* of development through *"developers making provision for the employment of local labour"* as an *"economic trade-off"* during the EIA process. They did, however, mention that these positive economic impacts are mostly limited to *"short-lived", "local"* provision of jobs *"during the construction phase".* Only two participants mentioned that addressing the gaps related to job creation could be improved by focusing on *"longer term provision of employment opportunities during the operational and decommissioning phases*". A few (5%) respondents explicitly mentioned the fact that the EIA process has the potential to create ***EIA-related jobs and opportunities*** [code (8)] for the role-players involved in the EIA process. This included jobs such as environmental assessment practitioners (EAPs), government officials (EIA reviewers and officials responsible for compliance and enforcement of conditions), specialists and environmental control officers (ECOs). 7% of the respondents indicated that EIA-related job opportunities are a realised benefit of EIA for society. The existence of mandatory assessment processes has been identified as creating a high number of jobs in the UK (Bond, 2003) and in China (Zhu *et al.*, 2005), and so some job benefits would be expected.

Whilst a few participants mentioned the promotion of ***economically sustainable development*** [code (7)] as a potential and/or realised benefit, no mechanisms were suggested to address the gaps between potential and realised benefits. The viewpoint of the respondents was that the EIA process provides for *"economic development, where the environmental- and social impacts are also considered"* to ensure that it is *"sustainable"*. Some participants made mention of *"strategically important developments (SIDs)"* and that the EIA process allows for fast-tracking these projects, where applicants and society in general may benefit from these strategically important projects or infrastructure.

Some respondents mentioned that the EIA process may ***lead to financial savings in the long term*** [code (9)] by means of *"proper screening, scoping and development planning"*. Early-warning (which relates to the fact that EIA may lead to financial savings, through improved design or suggestion of alternatives, also reducing operational costs and/or avoiding legal penalties and fines) is one of the four main benefits of EIA mentioned by O'Riordan (Garner & O'Riordan, 1982). Eight (4%) respondents mentioned long term financial savings as a potential benefit, and six (3%) respondents perceived it as a realised benefit. Phrases were mentioned such as: "*screening processes identifying unsuitable locations that need to be avoided*", *"implementation of the best practicable environmental option (BPEO)"* and *"building of proper structures"* – all perceived to contribute to long term financial savings.

Only 2% of respondents specifically mentioned the ***determination of financial viability of developments*** [code (10)] before commencement of the developments.

The economic benefits mentioned by the respondents compare well with existing literature [Loomis & Dziedzic (2018); Retief & Chabalala (2009); Oosterhuis (2007); Christensen *et al*. (2005, 2003); Nielsen *et al.* (2003); Wood (2003); Kobus & Lee (1993); Garner & O'Riordan (1982); Wessels *et al*. (2015); Marshall (2005); Bond *et al*. (2014); Wedin *et al*. (2013)] (see Tables 1 & 2). The participants of our study, however, explicitly mentioned *EIA-related employment opportunities* of EAPs, the regulator and specialists (code 8, Table 2), as a benefit of EIA, while the reviewed literature focus on the creation of job opportunities in general (EC 1, Table 1). The avoidance of civil and criminal liability costs (i.e. penalties and fines) through compliance and enforcement (EC 3, Table 1) was not specifically mentioned by respondents of this study in the *economic benefit* context. However, enforcement of legislation and requirements (code 16, Table 2) was regarded as a governance-related benefit.

4.4. Perceived governance benefits

Almost half of the respondents (46%) mentioned that EIA ***"allows for the assessment, management and mitigation of negative and positive impacts"*** [code (11)] as a potential benefit, although only 29% mentioned it as a realised benefit for society. This benefit was the second most highly coded, based on responses which mentioned: *"assessment", "impact assessment", "determination of impacts", "determination of risk", "management of impacts", "mitigation of negative impacts", and "enhancement of positive impacts"*. Loomis & Dziedzic (2018), Baker & McLelland (2003), Wood (2003), and Ortolano & Shepherd (1995) also mention the mitigation of adverse impacts as one of the key benefits of EIA (Table 1). 33% of respondents mentioned that mechanisms need to be implemented to address the gap between potential and realised benefits for society, by focusing on improving the "*EIA process"* in general (14% of respondents); improving the *"process for assessment, management and mitigation of impacts"* (6% of respondents); addressing the *"competence, capacity and objectivity of EAPs"* (9% of respondents); and considering *"specialist aspects/studies when impacts are assessed"* (5% of respondents).

With reference to the proposed improvements to the *EIA process, and process for assessment, management and mitigation of impacts*, the South African EIA regulations were reviewed and revised with the amended regulations coming into effect in December 2014. The amendment included various procedural and administrative changes. The regulations were amended again, in April 2017, with fewer substantial changes. Despite these changes, 14% of respondents indicated that the EIA process needs to *"change"* and *"improve",* while 6% of respondents specifically suggested that the *"process for impact assessment and mitigation"* needs to change. Suggested changes included *"pre-application consultation that needs to be formalised and legislated"*, "*time frames that should be changed"*, and that the EIA process should be changed to *"improve objectivity"*, "*allow for cumulative impact assessment*" and *"address sustainability aspects"*. Kidd & Retief (2009) argue that failures to achieve the potential benefits of EIA in South Africa may be rooted in the excessively structured EIA process, which, although

procedurally amended many times since 1997, has not necessarily improved quality, effectiveness or efficiency. Thus, although changes to the EIA process have been suggested by respondents of this research as a means of improving impact assessment and mitigation, there is little evidence from the literature that this delivers the expected improvements.

In South African EIA, NEMA establishes a particular role for the 'Environmental Assessment Practitioner' (EAP), defined in Section 1 of the Act as: *"the individual responsible for the planning, management and coordination of environmental impact assessments, strategic environmental assessments, environmental management plans or any other appropriate environmental instruments introduced through regulations".* The improvement of the *"competence", "professionalism" and "objectivity"* of EAPs were mentioned by 9% of respondents, as a means of improving impact assessment and management. Respondents mentioned a *"lack of independence and objectivity"* (from the process or applicant), *"inadequate report quality"*, *"inconsistency in information provided"* and *"unprofessionalism"* of EAPs as the main concerns that need to be addressed, in order to bridge the gap between potential and realised benefits related to impact assessment and management for society. Many studies on EIA quality review have concluded that the competence, professionalism and objectivity of EAPs may have an impact on EIA report quality [e.g., Sandham *et al*. (2013); Morrison-Saunders *et al*. (2001); Kågström (2016); Kågström & Richardson (2015)]. In South Africa, attempts have been made to address this shortcoming by legally requiring all EAPs (through GNR. 849 of 22 July 2016) to register with the Environmental Assessment Practitioners Association of South Africa (EAPASA) (established in 2012) in order to prepare and/or review EIAs and environmental management programmes (EMPrs) (by February 2020). EAPASA aims to promote the advancement of the practice and quality of environmental assessment in South Africa, and is expected to address the issues related to the competence and professionalism of EAPs.

Just four respondents mentioned that the ***identification of alternatives*** [code (12)] is seen as a potential benefit of EIA to society, whilst all four agreed that the benefit is being realised. None of the respondents suggested approaches for improving the realisation of benefits. This benefit may accrue to society in general (when the most preferred alternative considers societal impacts), but also more specifically to the proponent/developer, where the EIA process forces the applicant to consider alternatives. Alternatives may include technology, layout and site alternatives, to name a few, as well as the alternative of not going ahead with the activity (no go).

Engagement in ***public participation and stakeholder involvement processes*** [code (13)] was the third most mentioned benefit, with 31% of respondents identifying it as a potential benefit of EIA for society, and 25% perceiving it as being realised. Respondents largely mentioned the benefit of society being *"informed through the public participation process"*, and that they have a *"sense of power, control and/or influence"* in being *"included in the process of commenting and decision-making"* of new developments. Public involvement and participation are well-known and researched benefits of EIA (e.g., Oosterhuis, 2007; Robinson & Bond, 2003; Stookes, 2003; Stinchcombe & Gibson, 2001; Palerm, 1999; Chaytor, 1995; Ortolano & Shepherd, 1995; Garner & O'Riordan, 1982). Additionally, several authors point out the benefits that the *public participation process* could hold, such as the opportunity

to influence decisions (Hartley & Wood, 2005; Barton, 2002), social learning (O'Faircheallaigh, 2010), empowering marginalised individuals and groups (Lawrence, 2003; Vanclay, 2003; Barton, 2002; Gagnon, 1995), provision of information to improve the quality of the decision output (Connelly & Richardson, 2005 ; Petts, 2003), and conflict resolution (Lawrence, 2003; Petts, 2003), amongst others.

However, comments by the participants of this research indicated that they generally perceived the public participation process as *"ineffective", the "contributions from stakeholders as being poor"* and *"active involvement in the process being low"*. Regulators perceived this to be a problem mainly because of stakeholders (mostly society/members of the public) *"not being aware of public participation processes/meetings"*. Therefore 27% of respondents felt that the *"public participation process needs to improve"* and that *"increased involvement in the public participation process"* is required. The main reasons cited in literature for public participation failing to meet its objectives include: late initiation of public participation in the EIA process, limited participation mechanisms, poor contribution of relevant stakeholders, as well as time and cost implications of the process (e.g., Bisset, 2000; Hartley and Wood, 2005; Paliwal, 2006). The variety of causes for weak participation most likely underpins inconsistencies in the literature. For example, Amombo (2006) and Okello *et al.* (2009) noted that the existence of a legal framework for public participation significantly improved stakeholder involvement in the public participation process, whereas Marara *et al.* (2011) found that an existing framework did not have an influence on the level of public involvement.

The potential benefit of being ***involved in transparent, informed decision-making*** [code (14)] (which also links to the information provided in the public participation process) was the ninth most frequently cited benefit. 12% of the respondents perceived participation in *"transparent"* and *"informed decision-making"* as a realised benefit, where *"information gets shared" "transparently"* to allow society to be *"involved in informed decisions".* Their responses indicated that information being provided as part of the EIA process (and society's right of *access to information*) are perceived as benefits to society. 3% of respondents made specific reference to ***access to information and communication*** [code (15)] as being a potential benefit, whilst 2% perceived this benefit as being realised.

A further 12% of respondents made mention of mechanisms to close gaps related to the involvement in transparent, informed decision-making. Sixteen respondents mentioned that *"political interference need to be eliminated"* to improve transparency, and seven mentioned that the *"quality and information provided in EIA reports need to be improved*" to realise the benefit of making "*truly informed decisions"*. Mention was made to political interference in general, but also more specifically to "*conflicting mandates".* Humby (2015) elaborates on conflicting political, legal and decision-making mandates, where different competent authorities may have different visions, goals and targets. One such an example is the authorisation of prospecting and mining activities in South Africa, where the Department of Mineral Resources (DMR) is the decision-making authority for mining-related EIAs, with the concern being the dual role of the DMR as both facilitator and promoter of mineral development and protector of the environment (Humby, 2015). Also in South African, Duthie (2001) indicated that officials from provincial departments of environmental affairs responsible for EIA review and decision-making have highlighted *"political interference as a major obstacle to its work".* When reviewing similar literature

from the African and developing country context, it seems that political interference is a recurring factor influencing EIA practice (e.g., Kahangirwe, 2011; Bojórquez-Tapia and García, 1998).

Providing for enforcement of legal requirements [code (16)] was highlighted as a potential benefit by 8% of respondents, as a realised benefit by 11%, with 38% suggesting means for realising greater benefits. *"Elimination of illegal developments", "enforcement of legislation", "enforcement of the conditions of environmental authorisations and EMPrs", "compliance monitoring"* and *"alignment of developments with other sectoral legislation, policies and plans"* are examples of phrases mentioned in the context of potential and realised benefits. Loomis & Dziedzic (2018), Wessels *et al*. (2015), Chanchitpricha & Bond (2013) and Marshall (2005) have all highlighted the importance of compliance and enforcement (C&E) in the EIA context. 24% said that *"compliance monitoring and enforcement need to be improved"*, 4% mentioned that *"environmental authorisations should provide for clear, enforceable conditions"* and 10% mentioned that *"the competency and capacity of regulators have to be addressed" (as it relates to C&E).* Responses focused on government departments being "*under-capacitated"* in terms of *"skilled human resources"* and also indicated that *"objectivity of regulators"* is currently perceived as being an issue (with political interference, once again being mentioned in this context). The lack of compliance monitoring and enforcement are usually explained by a lack of resources and capacity (Duthie, 2001; Wessels *et al*., 2015).

The governance-based benefits mentioned by our respondents compared well to what is provided for in literature (see Table 1). The respondents focused on the benefits related to access to information and informed decision-making by *I&APs* (see G4 and codes (14) and (15) in Table 2), and did not mention the benefit that EIA *provides information for consistency in approach and fairness in decision-making by competent and commenting authorities* (G3, Tables 1 and 2) as mentioned by several authors (Table 1). None of the respondents explicitly mentioned the policy and institutional benefits of EIA (G6, Table 1) (such as better departmental relations, cooperative governance, changes to power relations between departments, development of otherwise absent expertise) and the benefit that the EIA process may have in improving the efficiency of other authorisation processes (G7, Table 1). Respondents did, however, when indicating means to bridge the gaps, mention that policy and institutional arrangements and the efficiency of other authorisation processes need to be improved, potentially pointing out the perception of respondents that these (G6 and G7) are not currently regarded as being benefits in South Africa, but rather focus areas to improve the EIA process.

4.5. Perceived sustainable development (all four systems) benefits

The potential to ***give effect to the Constitutional environmental right of society*** [code (18)] was the fourth most frequently cited benefit, with 30% of respondents identifying this as a potential benefit, and 17% perceiving this benefit as being realised. The *environmental right* gives effect to an environment which is not harmful to the health and wellbeing of society, as well as ecologically sustainable development, while promoting justifiable economic and social development – strongly linking to the concept of sustainable development. Responses included in this code made mention of *"giving effect to the environmental right"* (in the Constitution), ensuring an *"environment that is safe/not*

harmful to the health or well-being of citizens", and "providing for the Section 24 rights of citizens". Participants did not make specific mention of any measures to bridge the gap between the potential to achieve this benefit, and actually achieving it.

The ***promotion of sustainable development*** [code (17)] was the fifth most frequently cited benefit, with 29% perceiving this as a benefit, and 12% perceiving it to be realised. Sustainable development was described by some respondents as "*a way of benefiting the current generation as well as future generations"*. Respondents further connected sustainable development with the *"thoughtful, limited use of resources"* with implied consideration of inter- and intra-generational equity *where "current and future generations"* were mentioned. Some respondents stated that sustainable development is the "*achievement of a balance between the environment, social aspects and the economy"*. Finally, sustainable development was coupled with *"equitable, fair and informed decision-making".* It was also explicitly stated that the above-mentioned benefits could be *"facilitated through the EIA process"*. 13% of respondents mentioned that *"equal attention must be given to society, environment and economic impacts"* during the EIA process to bridge the gap between potentially and actually achieving sustainable development.

We argue that the expectation of regulators for EIA to (as a single instrument) give effect to the Constitutional environmental right and promote sustainable development may be overambitious. EIA is but one instrument which, if correctly implemented in combination with a suite of other instruments, policies and programmes, may partly contribute to promoting the environmental right provided for in the Constitution. Morrison-Saunders and Retief (2012) suggest a more pragmatic approach to changing EIA practice, where the EAP has a key role to play in ensuring that *sustainability thinking* is provided for in the EIA process conducted for individual developmental applications.

5. Conclusions

This paper provides insights into the perceived benefits of EIA for society, discussed against the nested egg model of sustainable development, from regulators' perspectives. When considering the conclusions of the research, it is important to note that this paper is purely based on the *perceptions* of regulators as it relates to the potential and realised benefits of EIA for society, and that no claims are made around benefits actually being achieved. This is an important area for future research, given that the perceptions of realised benefits in particular could be markedly different from actual benefits achieved. In many cases, however, metrics do not yet exist to accurately measure those actual benefits. We would also argue that there is merit in identifying the difference between regulator perceptions of potential and realised benefits, as this underpins their views on the extent to which EIA is delivering sustainable development.

The research demonstrates that the perceptions of regulators largely tally with the findings from the literature. The protection of biodiversity is regarded as the main potential and realised benefit for society, which highlights the fact that EIA is perceived to contribute mainly to the ecosystem services component

of the NFSD. This seems to reflect back to the original intent of EIA dealing with mainly environmental protection (Glasson and Therivel, 2019).

It is perhaps not surprising that coding the responses of regulators led to a more detailed breakdown of the overarching quadruple bottom line aspects of sustainability in the governance category. This is, after all, the category in which the respondents are positioned in terms of their responsibilities. A meaningful area for future research would be to examine the different emphases on benefits, by different stakeholder groupings such as proponents, interested parties and consultants. Research already shows that different stakeholders view the benefits of EIA differently (e.g., Bond *et al*., 2013), and this paper only covers one such stakeholder group.

Of note is the fact that regulators identified a significant number of potential socio-economic benefits arising from EIA. The understanding of the variety of benefits is arguably much richer than for ecosystem services benefits, albeit the overarching importance of ecosystem services was acknowledged. The emphasis on socio-economic benefits is perhaps not surprising for a developing country context, although the more general international trend towards more integrated and sustainability assessment is bound to support this result more widely. The interface between the biophysical and the social dimensions is central to most conceptualisations of sustainability.

Also important is the result that shows no single category of benefits cited by 50% of respondents. This range of responses suggests a lack of consensus across regulators about the benefits of EIA, which is concerning since it highlights a lack of agreement and clear direction from those tasked and mandated to implement the EIA system. In addition, the suggestions made for bridging the gap between potential and realised benefits were rather vague and suggested a lack of meaningful reflection on perceived failings. In order for EIA to be effective and remain the decision support instrument of choice for governments internationally, clarity and consensus is needed on the benefits and how to achieve them, especially from the regulators appointed as custodians and implementers of the EIA system. For society to have confidence in the usefulness and relevance of EIA the regulators themselves need to be clear and in agreement on its benefits.

Further research on the perceived and actual benefits of EIA to society will be useful. Based on the responses from our participants, it is proposed the following benefit categories, not explicitly mentioned as benefits of EIA in literature (outlined in Table 1), are considered as additional categories for future research on the benefits of EIA:

- **ES4:** Provides for resource preservation/sustainable use of resources (which a focus on consumptive use);
- **ES5:** Provides for prevention of pollution;
- **EC5:** Provides for EIA (process)-related employment opportunities (EAPs, regulator, specialist); and
- **SD2:** Provides for constitutional environmental right (including health, wellbeing and safety) (depending on the context/country).

It is, further, recommended that the benefit categories outlined in literature, but not explicitly mentioned by our participants (ES2, ES3, SP4, SP5, EC3, G3, G6 and G7), are retained for possible

future research, since the participant responses in this publication were mainly applicable to the perceived benefits of EIA in the *South African* context.

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