

Investigating the Influence of Participation in Environmental Impact Assessment on Organizational Learning for Regulators: A Focus On Renewable Energy Projects

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ABSTRACT

Environmental Impact Assessment (EIA) is an internationally recognised and globally implemented tool used to appraise developmental projects. The benefits of EIA have been widely reported in the academic literature and environmental management practice. EIA is applauded as a decision making and planning tool which can enable the identification, management, reduction and/or elimination of negative impacts and risks of proposed developments. In addition to these benefits, EIA is also recognised as a mechanism that promotes learning. These learning outcomes may result in transformation of personal values, standards, policy, and practise. Given this potential, the investigation of learning through regulator participation in the South African EIA process was adopted as a focus for this study. Public service organisations and their employees such as regulators, are subject to significant pressure to perform their duties capably and efficiently within the constraints of the public administrative structure. In the context of the EIA process, government organisations and regulators are considered to lack institutional memory and regulatory efficiency. However, it has been reported that public service organisations have the potential to learn, and organisational learning concepts could be utilised to identify this. This study aimed to investigate the influence of EIA participation on organisational learning for both competent and commenting regulators involved in EIA processes of renewable energy projects. A qualitative approach was taken for the study, where a total of 14 participants were interviewed through the use of semi-structured interview questions. The results were sorted and coded manually using thematic analysis techniques. The results presented the regulators' perception of learning outcomes gained through participation in renewable energy EIA projects. The findings of this study showed that regulators gained primarily single-loop learning outcomes at both national and provincial levels. Evidence of double-loop learning was possible mainly through collaborative engagements internally and externally. This study also found evidence of triple-loop learning for two participants; however, these outcomes could not be attributed to the rapid advances made in renewable energy project implementation. Furthermore, this study found that changes in the strategic focus of public organisations are constrained by the bureaucratic structure of the public organisation, thereby restricting organisational learning.

Keywords: Organizational learning, Environmental Impact Assessment, learning outcomes, EIA participation, renewable energy, competent, commenting, regulators, regulator perception.

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CHAPTER 1 INTRODUCTION

1.1 Research overview

Environmental Impact Assessment (EIA) is defined by the International Association for Impact Assessment (IAIA) (1999:3) as, “*the process of identifying, predicting, evaluating, and mitigating the biophysical, social, and other relevant effects of development proposals prior to major decisions being taken and commitments made*”. Through a systematic process (Sanchez & Morrison-Saunders, 2011) EIA facilitates decision making by providing relevant stakeholders with the necessary information to make informed decisions about a specific project or development (Ortolano & Sheperd, 1995; IAIA, 1999; Jay *et al.*, 2007; Poder & Lukki, 2011; Morgan, 2012; Scheepers, 2019). EIA is widely adopted as a legal instrument in many countries to appraise developmental projects (Morgan, 2012) and has technical and procedural importance (IAIA, 2012:1; Bond *et al.*, 2018). The technical component involves integrating science and objective assessment, whilst the procedural aspect deals with the institutional and regulatory application (IAIA, 2012:1). The procedural requirement is rooted in governance and the legislative framework of a geographical area (Hasan *et al.*, 2018).

Early provisions for managing the environment were primarily regulatory (Gibson, 2001; 2013) and have since moved toward a focus on sustainable development. Morgan (2012:5) notes that EIA is still considered an instrumental tool for environmental management even forty years later. Retief *et al.* (2016:52) has hailed the introduction of EIA as “*one of the most successful policy interventions*” because it allowed for the anticipation and planning of future developments in a static world. The system is now established in over 200 countries, according to Morgan (2012) and has proliferated into a multitude of environmental impact assessment tools holding importance in environmental policymaking (Bartlett & Kurian, 1999:416).

Positive critique afforded to EIA in the literature includes the identification, management, reduction and/or elimination of negative impacts and risks of proposed developments (Benson, 2003; van Heerden, 2010; Kabir & Momtaz, 2014; Ratshibvumo, 2016; Jones & Morrison-Saunders, 2017; Loomis & Dziedzic, 2018) as well as enhancing environmental, social, and economic benefits (Bailey & Saunders, 1988). EIA has been praised as an action-forcing mechanism, which strengthens project-level planning by providing necessary information to aid in decision making (Anderson, 2000; Gibson, 2001; Benson, 2003; van Heerden, 2010; Podi & Lukki, 2011; Bilgin, 2015; Ratshibvumo, 2016; Roos *et al.*, 2020). In addition to these appraisals, the literature also identifies the ability of EIA to promote learning, as evidenced by Jones and Morrison-Saunders (2018:137) and Fitzpatrick (2006:26).

The Cambridge dictionary defines the concept of learning as, “*the activity of obtaining knowledge of information by study or experience*”. The learning process involves “*the creation, retention and transfer of knowledge*” according to Argote and Hora (2017:579), which leads to the acquisition of new values and behaviours in addition to new knowledge and skills (Sanchez & Mitchell, 2017). Fitzpatrick (2006:158) explains that “*learning is usually an implicit component of environmental assessment*”, where learning in EIA can transform values, standards, and practice to support sustainable development (Cruz, Veronez & Montaña, 2018). Understanding how learning in environmental assessment occurs is essential because it enables the identification of EIA strengths, weaknesses, opportunities for sustainable growth, and personal and social change (Fitzpatrick, 2006:158).

Lawrence (2003:255) suggests that continuous learning is enabled through the iterative nature of EIA, which involves a series of questions being asked, investigations being undertaken, and decisions being made at every step of the EIA process (International Development Research Centre, 1994:19). This systematic process internationally comprises of the following generic phases; Screening, Scoping, Impact Prediction, Assessment, Mitigation, Preparation of an Environmental Impact Statement or Report, Review, Decision making and Monitoring and Auditing (Weston, 2000:186); each of which is correlated to best practice principles as defined by the IAIA (IAIA, 1999:4). Key to the iterative nature are the role players and stakeholders involved who interact at varying capacities throughout the process. Decision-makers identified in the EIA process by Weston (2000) have the potential to learn during the EIA process. Sanchez and Mitchell (2017:196) also highlight that groups who can learn include project developers, government regulators, consultant teams, individuals, groups, or organisations. Refer to Figure 1-1 for an overview of the best practise principles and the generic stages of the international EIA process, and the role players typically involved.

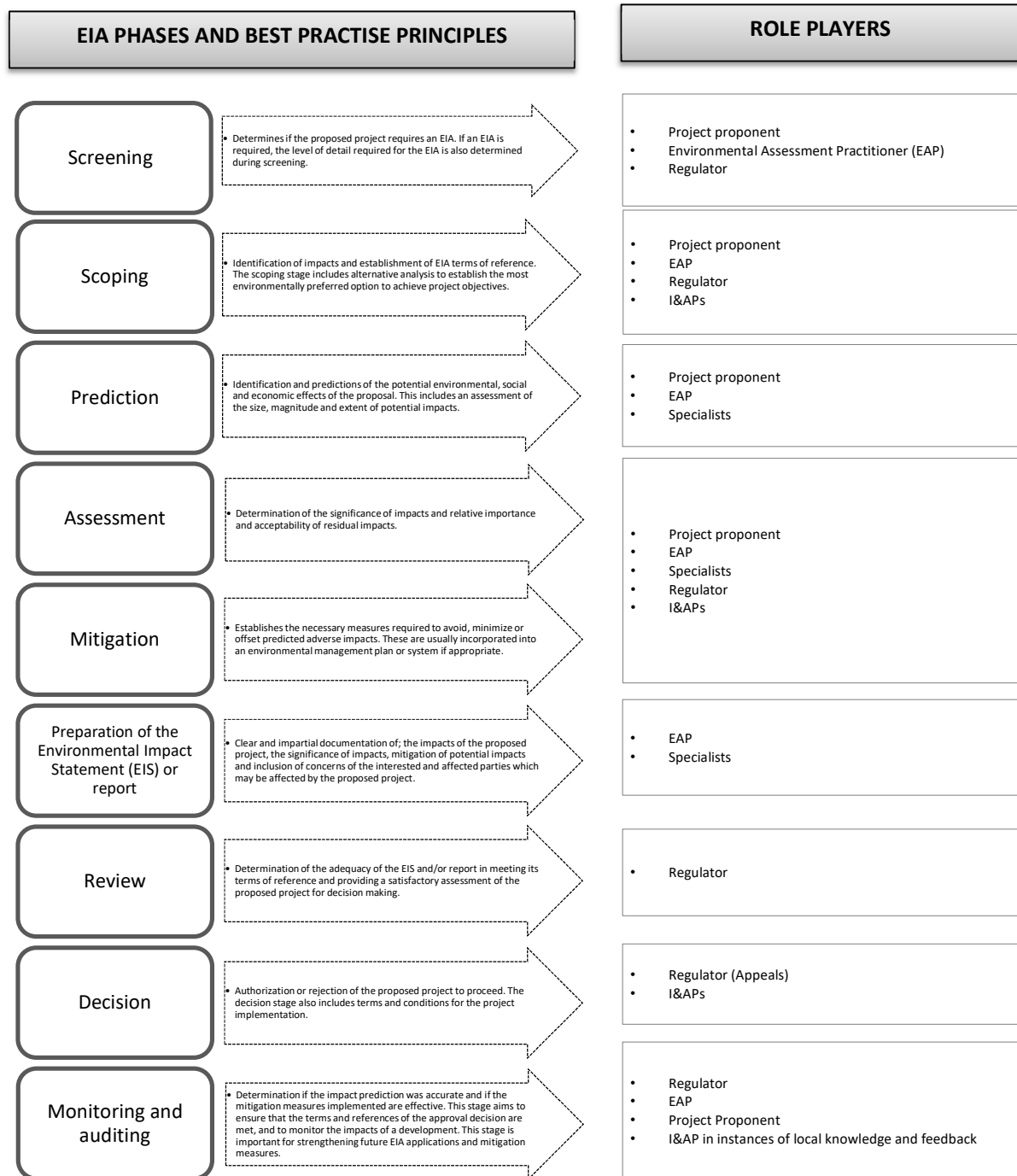


Figure 1-1: EIA phases and corresponding best practice principles and typical roles players in the EIA process (adapted from Weston (2000:186) and IAIA (1999:4) and personal understanding)

Sanchez and Mitchell (2017) commented that the role of the individual during EIA participation is based on specialised knowledge sharing. Furthermore, Argote and Ingram (2000) assert that learning by the collective such as groups and organisations are essential components in the learning process, where this collective learning is critical to impact assessment practice (Sanchez and Mitchell, 2017). Multiple collectives identified through the EIA process include; interested and

affected parties (I&APs), the project proponents and the regulator (or competent authority). Cilliers *et al.* (2020:358) define regulators as “*government officials responsible for EIA review and decision-making*” however the role of regulators also includes the implementation of EIA policy within a specific legislative framework and may be seen as the “*gatekeepers for proponents seeking approvals for new proposals*” (Morrison-Saunders & Bailey, 2009:284). According to Jones (2016), the regulator’s role is critical in EIA because they are responsible for decisions during the screening and approval stages and play critical roles in making decisions during the scoping, assessment, review, and monitoring phases (Jones, 2016:2).

Suzuki (2002:2) points out that organisational learning philosophy may be applied to a public service organisation where regulators work. This research draws on organisational learning philosophy nestled within the context of the well-established South African EIA system. The importance of learning organisational philosophy for public organisations, as explained by Glennon, Hodgkinson and Knowles (2019), is because public organisations need greater adaptability to accommodate the requirements associated with meeting the dynamic nature of public value. Organisational learning concepts, borne from organisation philosophy, describe how knowledge is created and embedded through an organisation. Argote (2013) defines organisational learning as “*a process which results in a change in an organisation’s knowledge which occurs as a function of experience*” (Argote & Hora, 2017:579). The regulator was chosen as the focus of this research due to their involvement in multiple phases of an EIA process (Jones, 2016) and their potential to learn through their participation.

The impetus of this research was to investigate the influence of regulator participation in renewable energy EIA to determine how organisational learning is influenced within South African EIA agencies (public service departments responsible for environmental affairs). This chapter proceeds with a summary of EIA theory and its link to EIA as an action-forcing mechanism (Section 1.2). After that, a context of the South African EIA process is described. The chapter concludes with the research motivation (Section 1.4) and research questions (Section 1.5) and ends with a description of the structure of this report (Section 1.7).

1.2 Basis of EIA as an action-forcing mechanism

The origin of EIA is attributed to the promulgation of the National Environmental Policy Act (NEPA) in the USA, which mandated full disclosure of the impacts of developmental decisions, which could affect environmental quality (Sanchez-Triana & Ortolano, 2001). Dreyfus and Ingram (1976) recognized that a change in policy value was needed to address the critique of governments’ handling of natural resources and the environment in the USA. The authors suggest that new values of environmental policy had to infiltrate federal administration to begin influencing policy decisions, which the NEPA did. Specifically, Section 102 to 105 of the NEPA directed the federal

government to undertake specific actions (Dreyfus & Ingram, 1976:248), which according to Jones and Morrison-Saunders (2017), aimed at transforming the behaviour of government agencies. The requirement of NEPA could therefore be considered an action-forcing mechanism by implementing EIA policy (Dreyfus & Ingram, 1976 and Jones & Morrison-Saunders, 2017) whilst aiding decision making (Noteboom, 2000 & Weston, 2000).

The role of EIA as an action-forcing mechanism is nested in the critical adoption of EIA theory which also explains the importance of EIA in environmental policymaking. EIA theory has influenced the realm in which EIA is practised and used. According to Kidd *et al.* (2018:1224), EIA theory is based on the information processing model. This model was postulated by Bartlett and Kurian (1999) and characterised the EIA approach as the acquisition of scientific knowledge and facts. The role of EIA was to generate, organise and communicate information (Bartlett & Kurian, 1999:417). Other models identified in the literature by Bartlett and Kurian (1999) highlight how EIA has been reported to influence decisions and policy and, in some models, affect change.

The symbolic model is described as a formality in some areas of the literature, stating that the undertaking of EIA can be used to legitimise specific actions. In contrast, an alternative interpretation of the symbolic model is that it allows for the embodiment of common values where implications on policy making include the sense that all parties share a sense of involvement and shared meaning in the process. The political economy model is based on the concept of regulatory compliance with EIA by private actors; through this model, policy can be shaped by the way participation alters “*financial opportunities, constraints and risks*” (Bartlett & Kurian, 1999:419). According to the author, organisational politics models are inherent in administrative agencies and can cause a change in the organisation's internal politics, dependent on the degree of transformation and changes that occur as a result of EIA participation.

The pluralistic model encompasses the integration and involvement of various stakeholders in the EIA process. Through this process, stakeholders can engage with scientific information and findings of an EIA process. This model widens stakeholder knowledge and includes indigenous and local knowledge in the process, thereby garnering knowledge and learning outcomes, which can be included in policymaking. The institutionalist model is based on the transformation of institutional values to bring about ecological rationality, where successful EIA results in changes in procedures, mandates, and rules. This learning then influences or changes notions of culture, values, and norms (Bartlett & Kurian, 1999:425).

It follows that EIA has the potential to affect policy to different degrees through participation in the process, which emphasises the role of EIA as an action-forcing mechanism as described by Jones (2016). The role of EIA as an action-forcing mechanism is nested within EIA theory and the systematic processes which comprise EIA practice. The ability to learn through the action-forcing

dimension of EIA practice has been identified by numerous authors and is described in further detail in the upcoming chapters.

1.3 A South African context

South Africa boasts a well-established EIA regime spanning more than 20 years of mandatory implementation and years of voluntary participation. Voluntary participation through integrated environmental management principles (Sandham *et al.* 2013) ended in the 1970s and 1997 became a statutory requirement under Regulation 1182 and 1183 (Section 21) of the Environment Conservation Act (ECA) (Act 73 of 1989) (DEA, 2003). According to Sandham *et al.* (2013:156), the EIA regime under the ECA comprised steps aligned with international practice, however in 1998, the National Environmental Management (NEMA) (Act 107 of 1998) was promulgated as the first overarching environmental law which supported the fundamental principles of environmental management in Section 24(b) of the Constitution. Blackmore (2018) states that the NEMA and its supportive legislation allowed for “*regulation both with and independently of the NEMA*”. The NEMA was the first legislation to introduce the concept of sustainable development, where according to Ratshibvumo (2016), the South African National Environmental Act (NEMA) integrates the three pillars of sustainable development into planning and decision making to incorporate the role of humans within the environment (Rossouw and Wiseman, 2004). The NEMA is supported by additional legislation called the Specific Environmental Management Acts (SEMA). In addition to the national legislation, there are also local structures in place, such as the Municipal Systems Act (2000), which sets out obligations for the environmental management objectives at the local government level (Rossouw and Wiseman, 2004) as per the Municipal Systems Act (Nel & Alberts, 2018).

The EIA regulations under ECA were repealed with the promulgation of the 2006 EIA regulations in terms of the NEMA (GNR 385, 386 and 387), which according to Sandham *et al.* (2003), introduced the concept of regulated activities which would require more detailed thresholds. The outcome saw the introduction of the Basic Assessment Process and Full Assessment (Scoping included) which was applicable according to specific listed activities a project would trigger. The 2010 NEMA EIA Regulations (GNR 543, 544, 545 and 546) promulgated three listing notices which prescribed the environmental assessment process to be followed depending on the nature of the project components and their geography in relation to sensitive areas. This was followed by the 2014 EIA regulations (GNR 982, 983, 984 and 985), which, in an attempt to streamline administrative processes by the One Environmental system, resulted in a resolution for the Department of Mineral Resources (now referred to as Department of Mineral Resources and Energy) to manage mining-related impacts. The Amended 2014 EIA Regulations (GNR 324, 325, 326 and 327) published in 2017 is the current regulations used for EIA processes which included amendments to align with the law and authorisation of mining activities.

Alberts (2020) describes the 2014 EIA Regulations (as amended) in terms of the NEMA as a “*list based screening mechanism*”, in that the authorisation process which should be followed for specific projects is dependent on which activities listed in GNR 983, 984 or 985 are triggered. GNR 983 provides Listing Notice 1, which prescribes a Basic Assessment process; GNR 984 prescribes activities requiring authorisation under a full Scoping and EIA Process; GNR 985 defines a Basic Assessment process for activities that are undertaken within specific geographic regions. A process diagram of a generic South African EIA is shown in Figure 1-1. An indication of the regulatory timelines is not relevant for this research.

Role players in the EIA process include the following groups; (1) Project proponent, (2) Environmental Assessment Practitioner (EAP), (3) Environmental Specialists (typically comprising of the environmental assessment project team), (4) Interested and Affected Parties (I&APs) and (5) Regulators (Competent Authority (CA) and commenting authorities). The project proponent is typically involved in the pre-feasibility stages until which they contract an independent EAP to undertake the authorisation process. The Interested and Affected Parties include the communities, Non-governmental Organisations (NGOs), environmental action groups, private companies, and anybody and/or entity affected by or interested in the proposed project. The EIA process is regulated in the NEMA, which makes provisions for the devolution of power to enable cooperative governance to a local level. This means that the Competent Authority can be the national department of environmental affairs (Department of Forestry, Fisheries and Environment (DFFE)) responsible for projects typically related to national or strategic importance. The Competent Authority may also be the provincial department responsible for the environment and conservation. Commenting authorities are involved with providing comments in terms of their specific mandate and may include (but are not limited to) departments responsible for aspects regulated in terms of the Specific Environmental Management Acts (examples; water affairs, energy and minerals, heritage resources, conservation) and land and planning departments.

Weston (2000:186) explains that specific questions are asked at every stage of the EIA process, and decisions are made. Decisions regarding the project design, screening, identification of impacts, mitigation and regulatory acceptance of the project are made by role players, which can include “*developers, planning and environmental consultants, competent authorities and all consultees in the process*” (Weston, 2000:185); therefore, outcomes and learning opportunities are possible at different stages of the EIA process.

Within the context of the South African EIA process, regulator participation includes opportunities to act and influence decisions during the screening and decision-making stages. Opportunities for regulators to provide input in the EIA process exist during the scoping, assessment, review stage and monitoring and auditing stage (as referred to as follow up). Figure 1-2 shows the stages in which regulators participate in the EIA process.

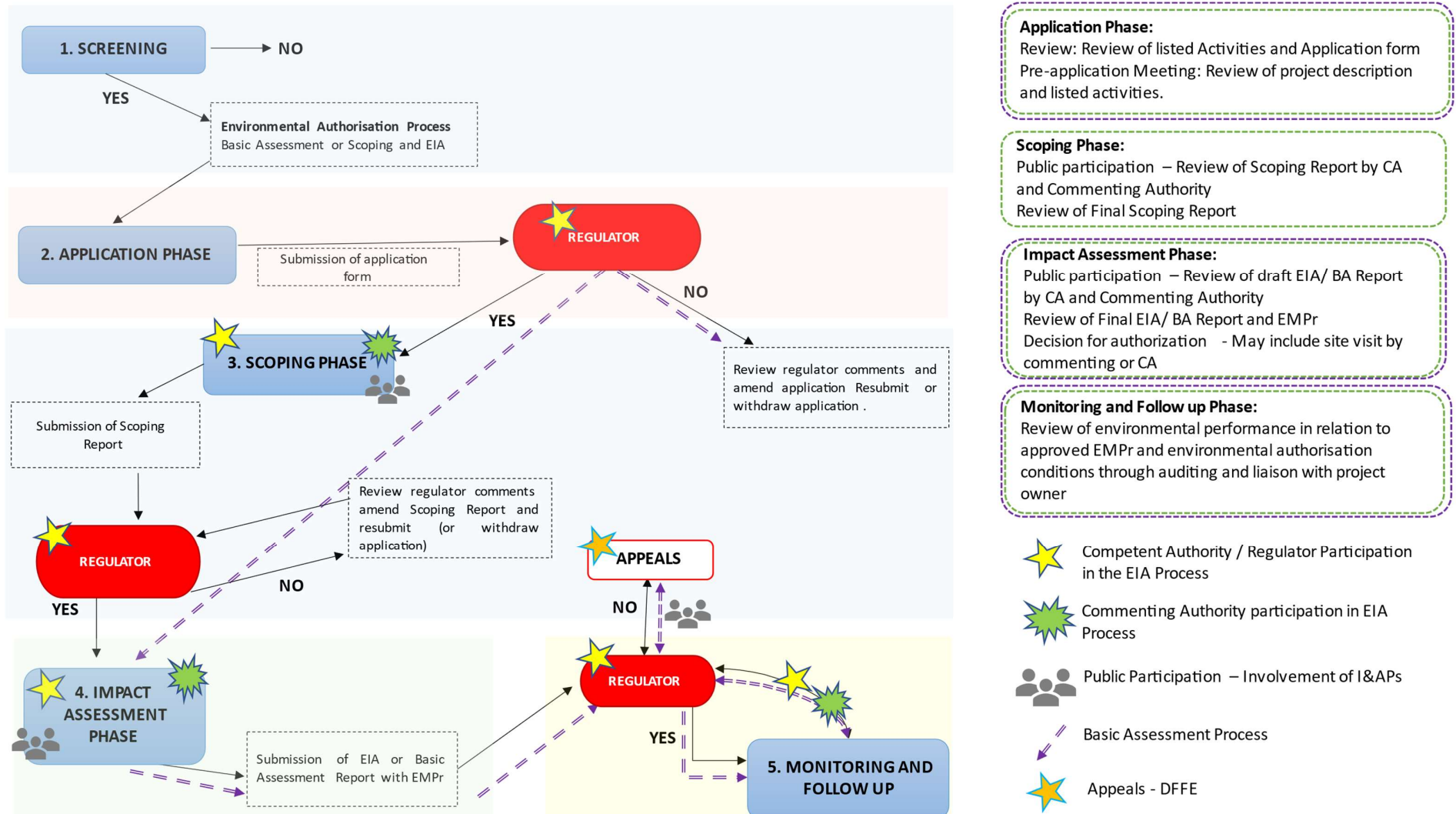


Figure 1-2: Generic EIA process and an indication of regulator participation in South African EIA process (own creation)

1.4 Problem statement and research motivation

Organisational learning comprises a multifaceted field of learning that features the social sciences, psychology, economics, information systems, and management sciences (Argote & Miron-Spektor, 2011:1123). The rise in the investigation of organisational learning was mainly a result of increased interest and developments concerning the advantages of learning and adapting to gain a competitive edge and drive the long term success of organisations (Argote & Miron-Spektor, 2011:1123). In addition, this field was investigated due to practical concerns such as the need for skill transfer in an ageing population and understanding why some organisations tend to cultivate learning better than others (Argote & Miron-Spektor, 2011). According to Rashman *et al.* (2009), there has been a large body of literature devoted to organisational learning since the 1990s, with a noticeable gap in research regarding public service organisations. More specifically, *“little attention has been given to the manner in which these organisations create, transfer, share and apply knowledge”* (Rashman *et al.*, 466:2009).

Public service organisations are subject to pressures for learning and innovation, which derive from users' expectations, other tiers of government and across a wide range of stakeholders (Rashman *et al.*, 2009 and Glennon *et al.*, 2019), and from the creation of complex inter-organisational structures. Some of these pressures faced by public sector employees include; the necessity to understand different stakeholder groups, the requirement to balance the demands of the public is complex due to the changing public service environment, metric-based performance systems and dealing with different judgements, priorities, goals, and interests (Glennon, Hodgkinson and Knowles, 2019). Additionally, the sharing of knowledge is central to the improvement of public services because the aim is to add value to the public sphere. This means that good ideas and practices are not, in theory, limited to one organisation or partnership but need to be transferred between services and levels of government (Rashman *et al.*, 2009).

The lack of institutional memory due to high government employee circulation is highlighted by Kidd *et al.* (2018:1276) as a link to regulatory efficiency from a South African environmental regulatory context, and the authors mention that there is a need for increased training of employees through experience. This research aims to investigate if, through their participation in EIA, regulators have perceived a change in experience and knowledge and thereby learnt whilst being involved in the South African EIA process. This inquiry builds on the mention by Kidd *et al.* (2018:1276) that decision making is improved by increased training and experience. Fiorino (2001:322) mentions that a learning approach to policymaking stresses knowledge acquisition and use, but policymakers are rarely considered *“sources and implementers of ideas, information and analysis that influence choice”*.

In light of the above, this research is motivated by; (1) the gap in the research identified by Rashman *et al.* (2009) that there has been little research based on investigation of organisational learning of the public sector; (2) the problem of the perceived lack of institutional memory, experience and training shown with the South African EIA public service department (Kidd *et al.*, 2018) and (3) the researcher's curiosity in determining if EIA participation influences organisational learning by regulators. Because it has been stated that organisational learning is a function of experience (Argote and Ingram, 2000), this research focuses on the experience of South African regulators (assessing officers) with participation in renewable energy EIA. Kriel (2010) stated that Governments' role is to formulate and execute policy, which addresses constraints and enhances positive opportunities for renewable energy.

This research will investigate public service regulators involved in the South African EIA process as either competent or commenting authorities for renewable energy projects. These regulators are public service employees of either the national or provincial departments responsible for environmental affairs. These regulator departments identified can be considered EIA agencies as described by Sánchez and Morrison-Saunders (2010:1), which through their participation in EIA, "*is able to learn from experience and accumulate information and knowledge*". It is important to note that this research does not attempt to link the theory of learning organisations to the learning obtained from EIA participation. Instead, the application of organisational learning concepts is utilised within the context of this research.

The potential for renewable energy generation in Africa is significant, where the International Renewable Energy Agency (IRENA), as cited by Aliyu *et al.* (2018), mentions that Africa can potentially produce a quarter of its energy demand by utilising clean energy renewable resources favoured in South Africa include solar, wind, geothermal, biomass, hydropower, and tidal energy (Jain & Jian, 2017). More recently, Akinbami *et al.* (2021:5082) cited that of all energy types used in South Africa, renewable energy comprises 5.5 %, which is separated according to solar (PV and solar thermal) (1.3 %), wind (2 %), biofuel (0.1 %) and hydropower (2.1%). This growth is depicted by Akinbami *et al.* (2021:5081) in Figure 1-3.

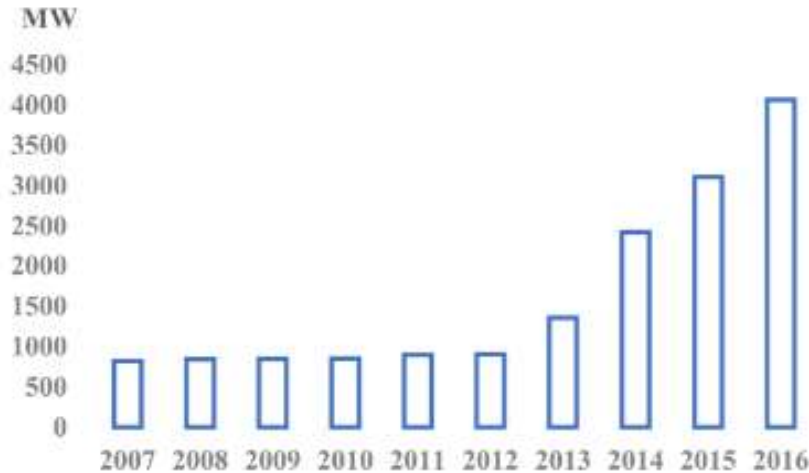


Figure 1-3: Total renewable energy capacity in South Africa (Akinbami *et al.*, 2021:5081)

The focus on the renewable energy sector is because South Africa has seen rapid growth in renewable energy developments. According to Fischer (2017:103), 678 applications for Scoping and EIA and 258 Basic Assessment applications were made between 2009 to 2015 to the National Department of Environmental Affairs. Nakumuryango and Lotz (2016) state a 37% growth in renewable energy consumption from 1990 – 2010. The rapid increase in renewable energy environmental developments and authorisations corresponded to this. The current growth in renewable projects is attributed to a competitive tender process called the Renewable Energy Independent Power Producers Procurement Programme (REI4P) in 2011 (Fischer *et al.*, 2020), which aims to give effect to the implementation of the National Development Plan (NDP, 2030) through the procurement of electricity produced by the private sector bidders called the Independent Power Producers (IPP). Scheepers (2019:2) suggested a general learning curve of renewable projects over the past years due to government introduced energy programmes, policy changes and new EIA regulations. It stands to reason that although regulators were experienced with EIA participation of developmental projects in the civil, mining, tourism, agriculture and conservation sectors, renewable energy would have required a steep learning curve to grow with technology and alternative energy requirements.

1.5 Research aim and questions

The research aims to determine if any learning outcomes influenced organisational learning for regulators involved in the EIA process for renewable energy in South Africa. This aim is important because it can clarify whether the rapid growth in renewable energy projects facilitated

organisational learning and improved decision-making through increased training and experience in EIA participation.

The main research question is, “What is the influence of participation in Environmental Impact Assessment (EIA) on organisational learning from a regulator perspective?”. The sub-questions guiding this research are:

Sub-question 1: What are the opportunities for learning within the South African EIA process?

Sub-question 2: What has been learnt by regulators through their participation in renewable energy EIA?

1.6 Research objectives

The objective of this research reflects the manner in which the aim of the research was achieved. The objectives are listed as follows:

1. Identify the opportunities for learning within the South African EIA process.
2. Identify the types of learning experienced by participants.
3. Design semi-structured interview questions for qualitative research.
4. Undertake interviews of voluntary participants.
5. Analyse the interview results (data) through coding.
6. Conclude if lessons learnt by participation in renewable energy EIA influenced organisational learning for regulators.

1.7 Structure of the research report

This research report has been structured in five chapters, as explained below.

- | | |
|-----------|---|
| Chapter 1 | This chapter provides an overview and background to the topics being researched. Motivation for the chosen research (problem statement), the research questions, and research aims and objectives that guide this research are provided. |
| Chapter 2 | This chapter aims to position the research within the context of published literature. The literature review provides a detailed explanation of the concept of learning and organisational learning. It includes a description of opportunities for learning to occur through participation in South African EIA, based on international published perspectives and opinions. The chapter |

concludes with the conceptual framework formulated from published works. The conceptual framework is used as the basis for the research investigation.

- Chapter 3 The research methodology and design chapter provide an overview of the researcher's position in the context of this research in which the research design and methods were chosen. The chapter also lays out the methodologies adopted for this research.
- Chapter 4 This chapter aims to present the results of the semi-structured interviews and correlate this to the research questions guiding the research.
- Chapter 5 The research report concludes the research results and provides recommendations for future studies.

CHAPTER 2 LITERATURE REVIEW

2.1 Chapter introduction

The overall purpose of the literature review is to situate the research question within the international discussion on the influence of EIA on organisational learning within the academic arena. According to Webster and Watson (2002:8), the literature review is a platform to advance knowledge (Webster & Watson, 2002:1). This literature review aims to tie together the concepts of learning and organisational learning (Section 2.2) to form a conceptual framework for the research. The chapter then provides examples to identify the opportunities for organisational learning within the South African EIA process by drawing on published literature (Section 2.3). This chapter forms the basis of the research design and methodology (Chapter 3).

2.2 What is learning and organisational learning?

Throughout history, there has been merit in sharing experiences and knowledge as a means of survival and adaptation. Norgaard (2004) explains that through shared experience, sharing knowledge and acting together, the human population was able to advance agriculture through technological innovation leading to industrialisation, through this process, early civilisations were able to act on shared knowledge (Norgaard, 2004:232), which over time came to what we now recognise as learning. A formalised definition provided in the Cambridge dictionary defines the concept of learning as, *“the activity of obtaining knowledge or information by study or experience”*. However, this definition is described with more focus by Sanchez and Mitchell (2017:196). They state that learning is *“a goal-orientated process concerned with the acquisition of new knowledge and skills as well as new behaviours and values”* obtaining this goal can be deliberate (with a specific objective in mind) or can be through a non-deliberate, innate process as described by Norgaard (2004). Whether it is deliberate or not, individual learning occurs from birth and is developed through adulthood, contingent on their individual learning styles as defined in the psychology literature (Kolb and Goldman, 1973). However, early sharing of knowledge and practise within communities and civilizations (Norgaard, 2004) imply that knowledge can be obtained by the collective (Lam, 2000).

In the context of Environmental Assessment (EA), Bond and Morrison-Saunders (2012:216) state that learning can occur at both an individual level and organisational level. Individual learning involves the learning experienced by an individual (Bond & Morrison-Saunders, 2012:216), whilst organisational learning is the knowledge that is shared, interpreted, and absorbed throughout an organisation (Fitzpatrick, 2006) which then contributes to how that organisation functions (Bond & Morrison-Saunders, 2012:216). The concept of organisational learning has been widely

investigated in management literature and the social sciences (Lyles, 2014). For this research, the definition of organisational learning as defined by Argote (2013) will be used, where *“organisational learning is a process which results in a change in an organisation’s knowledge which occurs as a function of experience”* (Argote & Hora, 2017:579).

A survey of the organisational management literature links learning (and organisational) processes to organisational efficiency and performance, innovation, and competitive advantages (Cohen & Levinthal, 1989; Argote & Ingram, 2000; Lyles, 2013; Argote & Hora, 2017; Khan & Khan, 2019). Fiol and Lyles (1985:803) explain that actions are improved when there is better knowledge and understanding. However, the enhancement of performance and effectiveness through learning (Fiol & Lyles, 1985) is not a determining factor of the learning process argues Huber (1991). Huber (1991:89) explains that learning does not have to be intentional, and the outcome of learning does not always lead to increased effectiveness or observable changes in behaviour; in fact, the outcome of learning can include changes in insights and awareness. Argote and Hora (2017) state that the outcome of learning is knowledge however, there are different levels of learning which occur in both organisational learning and learning processes, which are drawn out in further detail below.

2.2.1 Types and levels of learning

Types and levels of learning achieved through the EIA process can be identified as transformative, experiential, and social learning (Mezirow, 2003; Fitzpatrick, 2006; Armitage *et al.* 2008; Sinclair *et al.*, 2008; Sanchez & Mitchell, 2017; In Bond & Morrison-Saunders, 2012; Da Silva *et al.*, 2013; Cruz *et al.*, 2018) as explained in more detail below:

2.2.1.1 Transformative learning theory

The concept of transformative learning is borne out of Jurgen Habermas learning theory which described three domains for adult learning (Mezirow, 1981:3). Sinclair *et al.* (2008:420) explain that transformative learning comprises *“critical reflection and dialogue to promote social change, cognitive development and socio-economic empowerment”*. Diduck and Mitchell (2003:341) succinctly describe the transformative theory as adult based learning, which can result in changes in frames of reference (such as psychological standpoints, perspectives, beliefs, values, and attitudes) through a process of critical self-reflection, which may result in person transformations. Transformative theory is comprised of instrumental, communicative, and emancipatory dimensions.

2.2.1.1.1 Instrumental learning

Mezirow (1981:62) described instrumental learning as the manner in which an individual may manipulate and control their environment commonly based on technical and empirical knowledge, this form of learning involves the observable prediction of events, which can be proven right or wrong. The proof can be obtained through undertaking tasks and problem-solving to improve the performance of activities. Mezirow (2003:59) add that instrumental learning is generally involved in assessing true claims. This type of learning could be linked to the information processing model of EIA theory postulated by Bartlett and Kurian (1999), as Sánchez and Mitchell (2017) state that this learning type results in increased scientific skills and knowledge. However, Fitzpatrick (2006) points out that transformative learning and the promotion of change are not instrumental learning outcomes alone. Single-loop learning is associated with instrumental learning and occurs as a short-term response related to repetitive behaviour (Fiol & Lyles, 1985:807) to an identified mismatch between actions and outcome (Sanchez and Mitchell, 2017:196). Single-loop learning is a concept of organisation learning postulated by Argyris and Schön (1996). Sanchez and Mitchell (2017) explain that this single-loop learning is essential to the survival of the organisation because the action of change, will prevent future errors from occurring.

2.2.1.1.2 Communicative learning

Communicative learning differs from instrumental learning, according to Mezirow (1981:63) in that, "*it aims to understand meaning through systematic inquiry rather than establish casualty*". This learning type describes the meaning obtained from social interactions by understanding others' purpose, feelings, intentions, values (Diduck & Mitchell, 2003 and Sanchez & Mitchell, 2017:197), attempting to make the individuals involved understood whilst sharing ideas (Fitzpatrick, 2006). The concept involves understanding what is meant through communication and relies on reflection (critical and critical self) to assess what is taken for granted (Mezirow, 2003:60).

2.2.1.1.3 Emancipatory learning

Emancipatory learning describes the process of a change in the way an individual perceives, communicates, or evaluates information and regulates their behaviour (frame of reference) by the critical reflection of their personal beliefs and assumptions (Mezirow, 1997 in Sanchez and Mitchell, 2017). This aspect of transformative learning theory is almost brought together through emancipatory learning, according to Mezirow (2003:16)

which he interprets to include task-orientated problem-solving in instrumental learning and critical self-reflection seen in communicative learning. Diduck and Mitchell (341:2003) contribute that emancipatory learning links the disagreements from communicative learning, which are commonly resolved through “*force, authority or discourse*” to result in resolution through emancipation under the “*ideal conditions of learning*”. Lastly, according to Mezirow (1981:61), this learning is associated with perspective transformation associated with adult learning. Through perspective transformation, an individual becomes aware of their “*psycho-cultural assumptions*” and how it constrains their personal relationships, behaviours and thoughts, this awareness results in the emancipation of those constraining thoughts leading to action to overcome them.

2.2.1.2 Experiential learning model (learning by doing)

The experiential learning model was postulated by Kolb in 1984 and is based on the experience of individuals as a basis for learning, and simply described by Bond and Morrison-Saunders (2012:216) as learning by doing, which according to Armitage *et al.* (2008) is often an outcome of the transformative learning process. Kolb and Goldman (1973:2) explains that individual learning can be differentiated into a typology of learning styles and the learning environment in which the individual is or was situated. The authors highlight that learning through experience formulates a learning outcome that is very different from other cognitive theories of the learning process.

The experiential learning model is based on a cycle of four main concepts: Concrete Experience (CE), Reflective Observation abilities (RO), Abstract Conceptualization abilities (AC) and Active Experimentation (AE) (Kolb and Goldman, 1973:3). The model as produced by Kolb and Goldman (1973: 2) is shown in further detail in Figure 2-1 below. Kolb and Goldman (1973:5-6) point out through psychoanalytic research, it was identified that the learning cycle has seemingly opposing ideas, this emphasises the movement of the learning process to varying degrees.

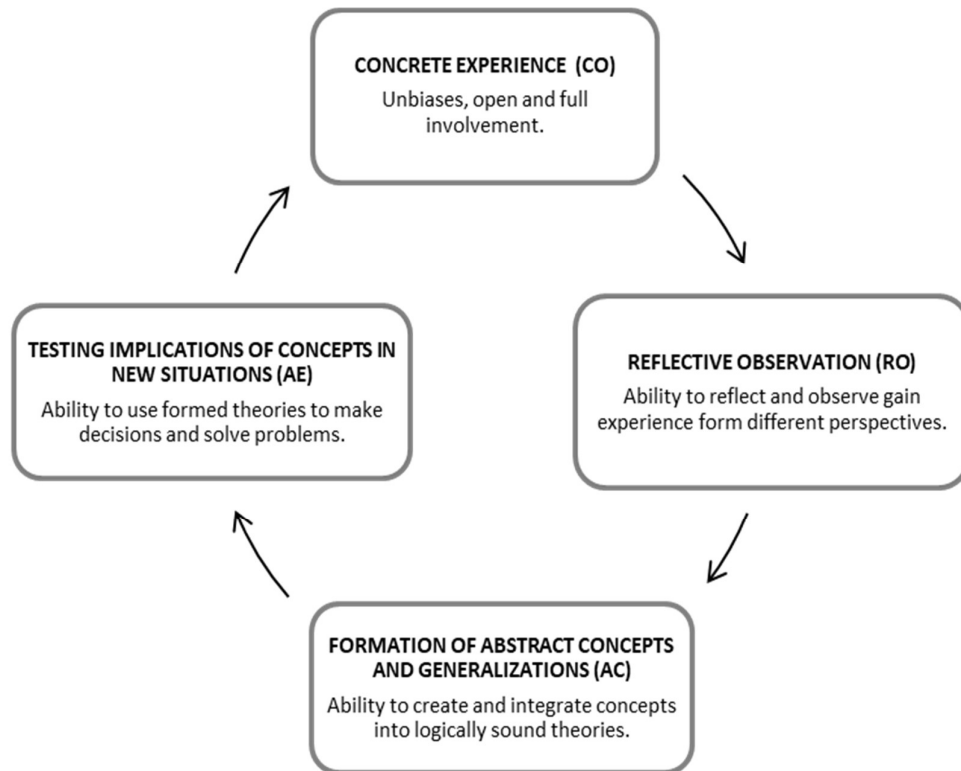


Figure 2-1: The Experiential Learning Model (Kolb and Goldman, 1973:3)

In their reserch, Kolb and Goldman (1973) introduce a classification of learning styles, each rooted within the internal and external context of the individual, which includes life experiences, hereditary biases, social and cultural context. Boud and Walker (1991:12-13) describe these aspects as the foundation of personal experience gained through past experiences, which influences the emotional and intellectual context to which the individual will assign meaning and value. Boud and Walker (1991:19-21) provide a helpful contribution to this research and explain that the reflective process requires the learner to critically reflect on what is happening in the experience of reflect on what happened during a past experience. Attention to emotions and feeling of a past or current experience provides insights to the learner on potential bias of the experience. Lastly, reflecting on what the experience means enables re-evaluation of the learning gained through that experience. According to Boud and Walker (1991:21), re-evaluation involves associating the new information from the previous two steps to past information (which is already known); the learner must then integrate relationships to the information and then validate the ideas and feelings which have resulted from the experience. The last step of appropriation involves making the knowledge gained one's own.

The relevance of the reflective process to EA is based on the recognition of role-players involved in EIA as individuals and highlight the dynamic and complex interactions required for the

appropriation of knowledge. Armitage (2008) adds that learning by doing at the individual level may then also be applied to inform group processes. It is important however to point out that although personal experience was explained above; learning by indirect experience is possible through “*watching, listening and imitating*” (Reese, 2011:13), where an individual's indirect experience is gained through another's direct experience (Reese, 2011:14). This is important to EIA because it involves multiple players, and certain experiences are limited at specific stages of the process and to certain people or groups.

2.2.1.3 Social learning

Social learning is based on social interactions that advance beyond imitation and can result in changes in individuals' social conditions and perspectives (Webler *et al.*, 1995 and Sinclair *et al.* 2008). The value of recognizing and understanding the pluralistic nature of individuals involved in the social interaction is emphasised by Chavez and Bernal (2008), because this understanding will contribute the richness of insight to the learning process. According to Webler *et al.* (1995), social learning should be considered to occur as a collective and not just a process which occurs by individuals within a group, this learning should be related to the manner in which the individual responds to shared problems. Webler *et al.* (1995:445) concisely defines social learning as, “*social learning refers to the process by which changes in the social condition occur—particularly changes in popular awareness and changes in how individuals see their private interests linked with the shared interests of their fellow citizens*”. This dimension of learning is strongly linked to the public participation process in EIA (Webler *et al.*, 1995; Fitzpatrick, 2006; Sinclair *et al.*, 2008; Chavez & Bernal, 2012; Sanchez & Mitchell, 2017). Social learning is comprised of cognitive enhancement and moral development, the former concerning the acquisition of technical knowledge as well as an understanding of values and preferences and feelings of the collective, the latter is concerned with how individuals make judgements whilst acting morally (Webler *et al.*, 1995:447).

Social learning can occur within the process and external of the EIA process, where the ability for social change can include all participants in the EIA process (Webler *et al.*, 1995 and Sanchez and Mitchell, 2017). Sanchez and Mitchell (2017:197) explain that by asking the question of who learns and the purpose of learning in EIA, one may distinguish between organisations, groups and individuals who learn. The authors indicate that transformative learning can occur within the social learning context, whereby the domains of communicative and instrumental learning are engaged (Sanchez and Mitchell, 2017:197). Thus, the linkage between transformative theory can be an outcome of participation in the EIA process (Sinclair *et al.*, 2008). Different learning levels can be an outcome of collaborative learning through EIA processes such as public participation, according to Sanchez and Mitchell (2017:196). The first level, single-loop learning, was

introduced as an outcome of instrumental learning. Double-loop can be linked to higher-level learning described by Fiol and Lyles (1985), which responds to more serious problems (Sanchez & Mitchell, 2017) and requires a more cognitive process than single-loop learning. Double-loop learning typically results in a change in the organisation's inherent norms, values and rules and strategies (Sanchez & Mitchell, 2017). Triple loop learning occurs when there is a change in the strategic focus of an organisation, as Sanchez and Mitchell (2017) explain triple loop learning can be considered within collaborative learning where outcomes include a change in personal perceptions whilst, "*encouraging systems thinking, joint learning and open communication*" (Sanchez & Mitchell, 2017:197).

2.2.2 Concepts from organizational learning

Knowledge gained by individuals resides in the brain and body of a person and can be transferred to other individuals and accumulated within an organisation (Lam, 2000). This collective knowledge is created when individual knowledge is shared and distributed within an organisation, and is accumulated by means of, "*procedures, rules, routines, shared norms and problem-solving activities*" (Lam, 2000). Argote and Hora (2017:579) state that organisational learning involves the creation, retention and transferring of knowledge whilst Sanchez and Mitchell (2017) point out that the knowledge needs to be embedded in the organisation's memory and structure. This is similar to Huber (2001), who proposed that knowledge acquisition, information distribution, information interpretation and organisational memory are key processes to organisational learning. According to the author, knowledge acquisition deals with how knowledge is obtained by an organisation. This could be done through the following sub-processes: (1) congenital learning, (2) experiential learning, (3) vicarious learning, (4) grafting and (5) searching and noticing.

Congenital learning according to Huber (2001:91) is gained in an organisation from its inception and grows over time as the organisation evolves, where it results in the collation of individual knowledge of the employees (at inception) and the learnings gained through new employee and institutionalised knowledge. Experiential learning is typically known as the learning through experience and reflection as described by Kolb and Goldman, (1973:3). According to Huber (2001:91) experiential learning can be obtained by organisations through organisational experiments whereby direct experience is fostered. Vicarious learning contributes to an individuals' (and organisations) learning through second hand experience (Huber, 2001:96), through imitation or learning from another's experience. Grafting involves the acquisition of new knowledge from new members who possess a skill not already available in the organisation (Huber, 2001:96). Lastly, Huber (2001:97), describes searching and noticing as a generalised term for the actions of an organisation to look outside itself to get a sense of the external

environment, to have a narrow focus inward in response to an actual or potential problem or opportunities and monitor performance for evaluation of the effectiveness of the organisation.

Knowledge acquired through learning can either be explicit or tacit (Argote & Hora, 2017:579), and outcomes of this learned knowledge can be evident as changes in cognition or behaviour (Argote & Miron-Spektor, 2011) within an organisation. Explicit knowledge refers to knowledge that is easy to articulate (Argote & Hora, 2017) and according to Lam (2000) can be produced through formal study. Argote and Hora (2017:579) cite approaches such as surveys, tests, and verbal procedures as possible ways to gauge explicit knowledge. Tacit knowledge on the other hand refers to knowledge that is difficult to articulate and is experience-based (Lam, 2000:489) usually comprising, "*skills, techniques, know-how and routines*". According to Lam (2000), the ability to use tacit knowledge has implications on an organisation's innovation and learning ability. Through the interaction of individuals and the collective and the result of explicit and tacit dimensions, the author describes four further types of knowledge; embrained knowledge, embodied knowledge, embedded knowledge, and encoded knowledge. According to Lam (2000:492-493), embrained knowledge is explicit knowledge at an individual's level. It is associated with formal, abstract, or theoretical knowledge and deals with "rational understanding" and "knowing" of universal principles and laws of nature. Embodied knowledge is a form of tacit knowledge gained by an individual which is action-oriented, practical (learning by doing) and is context-specific. Encoded knowledge is knowledge obtained through collective interaction and is represented by symbols or signs and stored in knowledge repositories such as blueprints, recipes, rules, and procedures. Embedded knowledge is a collective form of tacit knowledge that is embedded in common norms and organisational routines; this knowledge is relation specific, contextual, and dispersed.

Fitzpatrick (2006) cites information sharing, information interpretation and organisational memory as internal factors which can influence organisational learning. Information interpretation is influenced by cognitive maps and framing, media richness, information overload and unlearning. Gazolla *et al.* (2011:189-190) incorporate new ideas from the previous constructs, which include organisations internal culture (recognition and incorporation of individual cultures, traditions, values, and beliefs), mechanisms of inter-departmental coordination and collaboration as well as established process and procedure (structure), and behavioural routines as internal factors influencing organisational learning. Similar aspects included by Fiol, and Lyles (1985) include corporate culture (which includes shared beliefs that are conducive to learning and action taking), structure (a centralised rigid or mechanical structure will reinforce past behaviours whilst a fluid, the decentralised structure enables shifts in beliefs and actions), strategy and environment as key factors in organisational learning.

Once the learning has occurred and knowledge is created, it needs to be transferred into the organisation. As Fiol and Lyles (1985:804) point out, organisational learning is not merely an addition of individual learning. Argote and Ingram (2000:151) introduce the concept of knowledge transfer as a process where *“the experience of one group (department or division) is affected by the experience of another”* which can be measured by a change in knowledge or performance of recipient units and involves changes in knowledge beyond an individual to higher levels of organisational structure.

Knowledge transfer is not automatic (Argote & Fahrenkopf, 2016:147), and can be explained by the framework theorized by Argote and Ingram (2000) based on the idea that knowledge is embedded in different components (members, tasks, and tools) of the organisation and the interactions of these components determine the knowledge transfer. This is important to understand the potential for information acquisition and distribution with organisations. The components of an organisation include individual members, specific tasks, and tools. Networks may also occur across all the combinations above to facilitate the embedding of knowledge (Argote and Ingram, 2000).

Organisational memory is highlighted by both Huber (2001) and Fitzpatrick (2006) as the last process of organisational learning and is influenced by storing and retrieving information and computer-based organisational memory. Fitzpatrick (2006) outlines that individual's play a critical role in this process because they can be thought of as living memory. Organisational memory is influenced by storing and retrieving information and computer-based organisational memory. Learning outcomes could be acquired by individuals through participation in mentorship programmes where knowledge can be transferred and embedded in other individuals. Non-human mechanisms of organisational memory are through documentation, policy, data and archives of meetings, training sessions, newsletters, and websites (Fitzpatrick, 2006). Additionally, knowledge repositories reported by Sanchez and Morrison-Saunders (2011:2267) include geographical information systems and spatial databases, informal talks, senior staff, guideline documents, manuals, and templates.

This research will be primarily based on Fitzpatrick (2006:161) and the adapted framework from Argyris and Schon (1996) which comprises the internal structures which are important for organizational learning. In addition, the taxonomy of learning in impact assessment as postulated by Sánchez and Mitchell (2017:196) is utilized to identify who can learn from the process, what learning outcomes there are and how learning can be achieved through impact assessment. The key components of which include the acquisition, interpretation, and use of knowledge (Fitzpatrick, 2006 and Sánchez and Mitchell, 2017:195) and applies to EIA because it comprises the interaction of an interdisciplinary team and stakeholders to identify and assess impacts and

make predictions of the future state of the environment (Sánchez & Mitchell, 2017). Through this structured approach, the identification of different learnings (as explained above) can be identified.

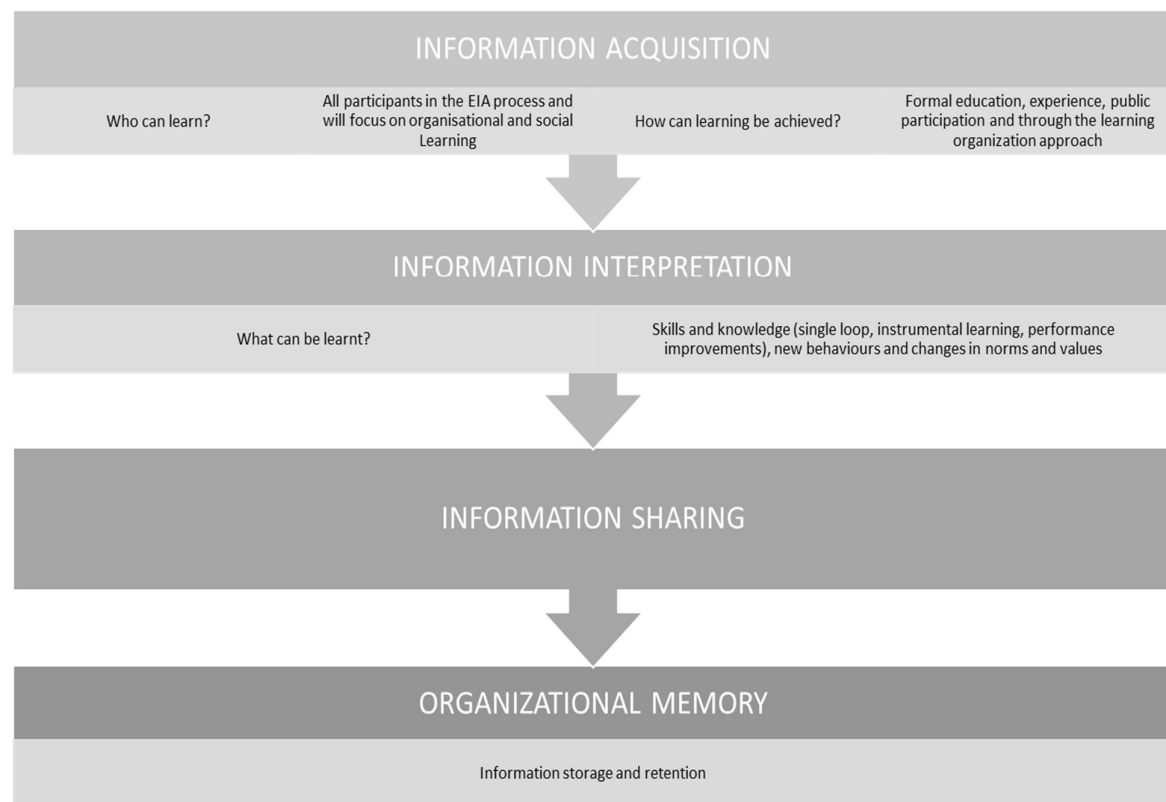


Figure 2-2: Proposed framework for this research derived from Fitzpatrick (2006) and Sanchez and Mitchell (2017)

2.3 Learning through participation in EIA

Outcomes and opportunities for learning are possible at different stages of the EIA process. In relation to regulator participation in the South African EIA process, opportunities for regulators to act and influence decisions occurs during the screening and decision-making stages. Opportunities for regulators to provide input in the EIA process exist during the scoping, assessment, review stage and monitoring and auditing stage (as referred to as follow up). Informal strategic advice in Western Australia was found to provide value and influence the outcomes of successive developmental proposals (Martin and Morrison-Saunders, 2015). The role of informal strategic advice in South African EIA participation is not formalised, although opportunities exist

during the screening or “pre-application phase” which normally requires consultation with proponents and regulators before the commencement of the formal EIA process.

During scoping phases there are learning opportunities to identify the indirect, cumulative, and direct impacts of a project (Sanchez & Mitchell, 2017). Sanchez and Mitchell (2017) also state that during the assessment stage, learning about the impact significance as well as the consideration of affected stakeholders is possible. Opportunities exist according to Diduck and Mitchell (2003) for decision-makers to learn how to best avoid and mitigate impacts that can be applied to future projects during the mitigation stages, whilst participation processes offer opportunities to learn from local knowledge and provide opportunities to understand stakeholder concerns. Hasan *et al.* (2018) emphasise that the role of public participation determines the success of EIA procedures. Due to the diversity of EIA actors involved in a project, the participation process provides a platform to incorporate different perspectives, expectations, and ideas into the process. Hasan *et al.* (2018) indicate that opportunities exist for the public to learn and gain scientific knowledge as well as gain insight and influence decision making. Inclusion of stakeholders early in the EIA process is also cited as advantageous according to Chavez and Bernal (2008), where single looped learning was an outcome of their three-phase participatory approach to the La Yesca hydroelectric plant project.

The monitoring and auditing stage provide opportunities to learn from implemented decisions and provide opportunities to identify and assess cumulative impacts and effectiveness of mitigation measures (Diduck & Mitchell, 2003). Another learning opportunity was found by Sanchez and Morrison-Saunders (2010) through the conveyance of learnings through knowledge repositories. The researchers who investigated knowledge management and organisational learning at an EIA agency in Western Australia, the EIA agency plays a key role in facilitating how knowledge is fostered through their role in reviewing applications as well as fostering various categories of knowledge repositories. The authors also convey that these knowledge repositories, and in effect learning which occurs; allow for better decision making of EIA applications (Sánchez & Morrison-Saunders, 2010). The example above illustrates that learning is possible through EIA participation or at some stage of the EIA processes. Section 1.2 described how the EIA process acts as an action-forcing mechanism that lays the foundation of EIA learning. Drawing on this foundation and learning types described above,

Table 2-1 provides an overview of the published research on learning through EIA participation.

Table 2-1: Academic research investigating the influence of EIA participation on learning

RESEARCH ARTICLE	LEARNING TYPE	FINDINGS OF RESEARCH
Webler <i>et al.</i> (1995)	This research was based on social learning.	The study established a cooperative discourse model that focussed on social learning. The cooperative discourse model was applied to a case study on siting of a municipal landfill in the eastern region of the Canton of Aargau in Switzerland. The waste disposal sites were initially planned but didn't include citizen input, resulting in opposition to the landfill siting. After the siting analysis stage was complete, citizens were then included to review the information. The results showed an enhancement of cognitive ability and moral development. Through participation in 40 hours of lecture and discussion, the citizens gained scientific knowledge in areas of specialisation such as landfill technology, geology, and hydrogeology. There was a contribution of local knowledge of the site, gaining the buy-in and confidence of the role of science and technology involved in the process and an increased understanding of acceptable risk. There was an evolution of trust throughout the process at individual capacity. The study concludes with the importance of integrating the criteria of fairness and competence with the criteria for social learning to obtain successful participation exercises to strengthen democratic decision making.
Glasson <i>et al</i> (1997)	This research investigated the changes in EIA quality through analysis of EIS quality in UK Planning Projects and learning through experience.	The research used macro and micro studies to determine the improvement of EIA process and Environmental Impact Statements (EIS) quality in UK planning projects. The macro studies used numerous academic frameworks, whilst the microstudies used participants perspectives (local planning officers, developers, consultants, and others). Participants results indicated that the quality of EISs is subject to early clear consultation, negotiation, and participation in scoping activities. The macro study results indicated that consultants and local authorities with more experience in the EA process produced better quality EISs. The study also indicated that training and resources such as guidance documents may also

RESEARCH ARTICLE	LEARNING TYPE	FINDINGS OF RESEARCH
		attribute to better quality EISs. The study concluded that the learning occurred through experience and an improvement of EIA quality.
Sanchez-Triana and Ortolando (2001)	This research demonstrated learning by imitation.	Illustrated learning by imitation and doing at Columbia's Cauca Valley Corporation (CVC). The authors found that the organisation did learn but by imitation of US policy to increase their credibility however the CVC changed their internal policy subjectively to their organisational favour by excluding important stakeholder inclusion processes. This research illustrates that although learning through EIA participation occurred, it did not lead to environmental improvements.
Diduck and Mitchell (2003)	This research focuses on stakeholder participation in EIA and social learning.	The study indicates that through EIA participation, decisions makers can learn about measures to avoid and mitigate adverse effects of a project, whilst public involvement can assist decision-makers to learn from local or traditional knowledge through public involvement. However, the engagement should be undertaken early on in the process and stakeholders should make decisions in accordance with their learnings away from the "conventional growth-orientated thinking".
Fitzpatrick (2006)	This research is focused on opportunities for transformative learning.	The study explored the link between EA, public participation, and learning from the Wuskwatim Generation Station and Transmission Line projects Environmental Assessment and concluded that participants experienced both instrumental and communicative learning outcomes whilst two participants indicated perspective transformation learning outcomes.
Chavez and Bernal (2008)	This research is focused on public participation and its link to social learning and organisational learning.	Single looped learning was an outcome of their three-phase participatory approach to the La Yesca hydroelectric plant project, which was aimed at early engagement of the public and participatory and joint learning. However, the study resulted in instrumental learning with an indication that organisational learning is a long term process.
Sinclair <i>et al.</i> (2008)	This research is focussed on public participation	This study undertook empirical investigations of 16 case studies that were undertaken in Canada over 11 years and were focussed on public participation in

RESEARCH ARTICLE	LEARNING TYPE	FINDINGS OF RESEARCH
		the EA process. The initial findings contributed to the discovery of the linkages between public participation, education, and learning. The study found that organisations from the case study changed behaviours and perspectives with regard to sustainability.
Jha-Thakur <i>et al.</i> (2012)	This research involves transformative learning	The author investigates the extent to which Strategic Environmental Assessment (SEA) can influence learning outcomes and both individual and organisational levels in Germany, Italy, and the UK. The study found that distinct approaches to SEA were developed, and opportunities for better learning were identified.
Sánchez and Morrison- Saunders (2011)	This research is focussed on knowledge management	The authors aimed to examine how the knowledge management process affected the learning in EIA agencies in Western Australia. The authors found that there are numerous (both formal and informal) ways in which knowledge can be managed within an organisation to improve the organisation's ability to learn.
Da Silva <i>et al.</i> (2013)	This study investigated the influence of environmental assessment on learning outcomes in organisations.	This research analysed published literature to determine if the environmental assessment can be a catalyst for the achievement of sustainable outcomes. In this regard, types of learning and outcomes were explained. The study concluded that environmental assessment has barriers to the learning outcomes possible. A recommendation for organisations to adopt a learning organisation approach was given.
Jones (2016) and later published as a research article cited as Jones & Morrison-Saunders (2017)	This research was based on the long-term influence of EIA on organisational learning in a proponent agency.	The author finds that multiple opportunities exist for decision making within the EIA process. Jones (2016) identifies that project proponents are central to the EIA action-forcing mechanism and decision-making process, however opportunities for other role-players participating in EIA exist. The study concluded that participation in the EIA process influenced organisational learning and transformation of a proponent organisation by primarily guiding internal change for decision making.
Cruz <i>et al.</i> (2018)	This study investigated the potential of EIA for learning processes.	The study compromised the development of a conceptual model using both empirical evidence and theoretical evidence to describe learning. New insights on

RESEARCH ARTICLE	LEARNING TYPE	FINDINGS OF RESEARCH
		levels of (loop of learning) within EIA systems was gained. In addition, the model developed can be used by practitioners and scholars to understand the different dimensions of learning.
McLauchlan and João (2019)	This research investigated the role of learning in SEA.	The research investigates evidence from Scotland to investigate the role of learning in SEA due to the SEA Directive. The authors found that SEA can provide valuable learning opportunities for participants in the SEA process, such as institutional changes, some of which were permanent. Local governments were found to use SEA outcomes (environmental impacts) to justify and formalise some of their existing planning processes, which was supported by collective information sharing.

The published works indicated that learning outcomes through EA was possible where technical learning outcomes were most common (through the improvement of technical knowledge). This technical learning outcomes were reported by Webler *et al.* (1995), Diduck and Mitchell (2003), Chavez and Bernal (2008) and Da Silva *et al.* (2013). In particular, Da Silva *et al.* (2013) noted that when there is direct participation and monitoring of scientific activities there can be changes in individual, group and organisational cognition and behaviour (single loop or double loop learning), however barriers do exist both internally and externally to hinder this process with public participation and information sharing being one of them.

The role of public participation in EA was also highlighted in the published works, where social learning proved to enhance the quality of EIAs and improve knowledge, understanding and trust. Sinclair *et al.* (2008) reported that public participation was a way to change perspectives in behaviours and perceptions of sustainability which positively linked education and learning. The findings of social learning as reported by Webler *et al.* (1995) indicated that social learning and experience (albeit coupled with string technical teachings) helped garner trust amongst individuals and foster learning and trust for the public. The inclusion of indigenous knowledge was also found to improve regulator decision making as reported by Diduck and Mitchell (2003). In general, the literature reported that public and stakeholder inclusion and engagement early on in EA processes can enhance instrumental learning (Chavez and Bernal, 2008 and Sinclair *et al.*, 2008). Research by Sanchez – Triana and Ortolando (2001) cautions on the negative implication of imitation learning without adequate internal structures for change. In their study, it was reported that face value leaning outcomes were gained, but important stakeholders were excluded from the process after the case study organisation gained credibility through imitation.

In tying the link between experience and quality of EIAs Glasson *et al.* (1997) found that EIA quality improved by consultants with a greater amount of experience in EA. This could be further supported by the integration of indigenous knowledge to improve decision making as reported by Diduck and Mitchell (2003).

The learning potential through SEA was investigated by Jha- Tahkur *et al.* (2012) and McLauchlan and João (2019). The former authors indicated that SEA could contribute valuable opportunities for maintaining technical knowledge of an area such a baseline information and may lead to knowledge acquisition and improved comprehension which can be used to effect changes in spatial planning. The latter authors found that SEA participation can provide learnings which can drive institutional changes and permanent policy advances.

2.4 Chapter conclusion

This chapter provided a foundation of learning types and organisational learning processes within the published literature. The potential for learning from participation in the EIA process was confirmed in this chapter, where transformative learning, experiential learning and social learning emerged as typical learning processes found in previous studies. The mechanisms of organisational learning found in previous works was explained, upon which a conceptual framework to investigate the occurrence of organisational learning through EIA participation was developed. This framework recognises information acquisition, information interpretation, information sharing and organisational memory as facilitating mechanisms to derive learning within the context of EIA participation. The chapter ended with a tabulation of published examples of learning outcomes observed through EIA participation. The theoretical concepts and research examples formed the building blocks for this research, whereby the practical research findings could be anchored in the theoretical findings. The next chapter provides a description of the research methodology used in this research.

CHAPTER 3 RESEARCH METHODOLOGY

3.1 Chapter introduction

“Research is an expression of faith in the possibility of progress. The drive that leads scholars to study a topic has to include the belief that new things can be discovered, that newer can be better, and that greater depth of understanding is achievable. Research, especially academic research, is a form of optimism about the human condition.” Henry Rosovsky (1990:89). “The University: An Owner’s Manual”

Leaning on the ideas of Rosovsky (1990:89), my sentiment towards this research topic highlights my interest in the possibility of new discoveries, progress, understanding, and optimism about the human condition in the context of South African environmental regulation. The impetus to explore the phenomena of organisational learning through EIA participation is rooted in my personal experience of 8 years as a practising environmental professional in South Africa. Government departments are commonly marred by the label of being riddled with problems, and O’ Leary (2017:19) explains that social research can be used to make a difference in this context. Research thus provides an opportunity to repeatedly observe a particular phenomenon from different dimensions (Singh, 2006:2).

This chapter explains the research paradigms in which this research is situated and details the methodology and research design used, the conceptual framework adopted for the research is also presented. The chapter concludes with a summary of the ethical considerations and delimitations of the research.

3.2 Research philosophy

Borne out of Thomas Kuhn’s Structure of Scientific Revolutions (Kuhn, 1962 & 1970) which analysed the evolution of science, the research paradigm has become the starting point that determines the specific context in which all academic research is conducted. In his second edition of the Structure of Scientific Research, Kuhn explains that *“Men whose research is based on shared paradigms are committed to the same rules and standards for scientific practise”* (Kuhn, 1970:11) and can be thus considered as a shared manner of philosophical thinking (Kivunja and Kiyuni, 2017:26). Anand *et al.* (2020:1650) elaborate that a scientific paradigm consists of shared methods, language, theories, and fundamental ideas. The paradigm chosen will dictate how a research study is postulated based on the researcher’s beliefs (Bryman, 2012:630), how the world is viewed and how the inquiry of the research is guided (Rahi, 2017:1). A paradigm is also known as the theoretical framework used in research and consists of assumptions regarding ontology, epistemology, and methodology (Rehman & Alharthi, 2016:51).

Ontology describes the researchers view on the nature of reality, what exists and how the researcher sees the world and what can be known about it (Bryman, 2012; O' Leary, 2017; Antwi & Hamza, 2015). Epistemology provides assumptions on the "how do we know?". It encompasses the researcher's view on legitimate knowledge (Antwi & Hamza, 2015:2017), how it can be acquired (Snape & Spencer, 2003:1 in Ritchie and Lewis, 2003) and the best ways to study it (Bhattacharjee, 2012:18). Bryman (2012) also introduces the concept of post-modern epistemology in a social research context. This concept leads to the assumption that, "*the construction of knowledge is determined by the large role played by people and that knowledge and truth are relative, fluid and ambiguous*" (Bryman, 2012:14).

The philosophical stances in the context of ontology and epistemology have been further delineated into the following main research theories; (1) positivist theory, (2) interpretative theory and (3) critical theory. According to O'Leary (2017:23), the positivist paradigm is rooted in the traditional scientific method relies on testing hypotheses. Further to this, the positivist approach is based on verifiable measurements and observations (Khaldi, 2017:17). However, O'Leary (2017:23) does point out the emergence of the post-positivist paradigm whereby approaches can be, "*collaborative, exploratory and participatory*". The interpretative paradigm is aimed at understanding the world as it is from the subjective experience of individuals (Antwi & Kasim, 2015) that is, multiple realities that can be socially constructed (Rehman & Alharthi, 2016:55), it is important to note that this paradigm relies on the understanding of the participant's viewpoint and not the researcher (Rehman & Alharthi, 2016). Critical theorists according to Ryan (2018), take a historical realist approach to the way they view the nature of reality, and acknowledge the complexities involved with the evolution of society. Based in modified subjectivity, these theorists believe that both the research and society are influenced by their own perceptions and experiences.

Lastly, methodology according to Rehman & Alharthi (2016:52) refers to the "*study and critical analysis of data production techniques*" and provides the strategy in which the research will be conducted (Bryman, 2021:36). The next section goes on to discuss the research paradigms used in this research.

3.2.1 Research paradigm adopted in this research

Kuhn's essay advocates for the priority of paradigms in research (Kuhn, 1970) to facilitate the evolution of science, whereby new theories and schools of thought replace or advance the old. In drawing back to ideas introduced in Chapter 1, the priority for paradigms can also be illustrated by similarities in schools of thought in terms of EIA theory. For example, the positivist paradigm draws similarities to Bartlett and Kurian's information processing model (Bartlett & Kurian, 1999),

whilst other paradigms were the building blocks for other EIA theories which now shape the global academic arena and guide research.

This research was undertaken by adopting specific philosophical assumptions which were congruent to my personal stance as a researcher in relation to the aim of the research. The research is mainly situated within the interpretivist theory whereby there is an acceptance of the dynamic social dimension to social research. According to Bryman (2012:28), interpretivism is concerned with the empathetic understanding of human behaviour and recognizes that these are influenced internally, externally and within both dimensions, rather than being the subject of actions forced onto it. The interpretivist approach is considered concurrently to its phenomenology dimension as this best describes the interpretation of meaning in terms of individuals experiences (Ryan, 2018). In addition to this, aspects of critical are included to accommodate for the inclusion of the personal perspective and experience of participants.

The ontology of this research is based on the position of constructionism, which asserts that social phenomena and their respective meanings are dynamic and changing, where the meanings are drawn from these constant changes as well as social interaction (Bryman, 2012). The nature of this research relies on individual perceptions of learning outcomes through EIA participation, the phenomenon of learning is therefore fundamentally reliant on the individual experience. It is important to highlight that, this research excludes the influence of a learning organisation and thus considers only the individual perspective of experience.

Knowledge according to the experiential learning model, needs to be acquired and assimilated by the individual who makes this information their own. In line with this, a qualitative approach to this research was chosen in order to gauge the participant's personal beliefs and to enable the researcher to understand the resultant learning phenomena. According to Soiferman (2010:8) the intent of qualitative research is to learn from the participants of the research and that the process will consist of multiple realities (which is an individual's experience and perspective) which can then be analysed as a collective. The qualitative approach moves from a specific observation of individual participants to a broader generalisation of the sample population.

Further to this, this type of research required the application of inductive reasoning which will build on the starting point of theories identified for the phenomenon of organisational learning and EIA learning from the literature review. The reason this approach was applicable for this research because the proposed framework based could be used as guide to structure the interview questions. Thereby allowing for the research to evolve from a specific starting point (literature or theory) to individual perspectives (interview responses) and to a broader generalisation amongst the sample population. These generalisations are made possible by analysing the interview

responses to find themes, similarities, or patterns amongst participant responses. Given that the research involves human participants, the outcomes may be variable, the inductive reasoning also allowed for a more open ended initiation of the research and more adaptability in terms of understanding individual responses and experiences.

3.3 Research Objectives

The following provides an overview to the relevant sections where the research objectives were fulfilled.

Table 3-1: Research objectives and reference to where they have been fulfilled

RESEARCH OBJECTIVE	REFERENCE TO SECTION OF RESEARCH REPORT
Identify the opportunities for learning within the South African EIA process.	Section 1.3 Section 4.3.1
Identify the types of learning experienced by participants.	Section 4.3.3
Design semi-structured interview questions for qualitative research.	Section 3.4
Undertake interviews of voluntary participants.	Section 3.4.2.2
Analyse the interview results (data) through coding.	Section 3.4.3 Section 4.3
Conclude if lessons learnt by participation in renewable energy EIA influenced organisational learning for regulators	Section 5

3.4 Research strategy

“Research is formalized curiosity. It is poking and prying with a purpose “ (Hurston, 942: 143 as cited by O’ Leary, 2017:18).

3.4.1 Sampling strategy

The researcher obtained a sample population in this research by inviting potential participants across the nine provinces, including the national Department of Environment, Forestry & Fisheries (DFFE) to partake in the research. A database was compiled by the researcher to identify the eligible departments responsible for commenting on renewable energy projects as well as those departments who exercise competency for renewable energy projects. Contact details were gained by searching the DFFE websites, and by utilising the *“EIA Process Queries”* list accessible from the DFFE screening tool platform (DFFE, 2021).

Other participant details were gained, through contact with members from the IAIA South Africa who distributed publicly available lists to the researcher. A total of 30 potential participants were invited, however the population size for this research totalled 14. At the end of the initial set of interviews, the researcher asked the participant if they could refer a colleague to participate. Seven participants who consented to participate in this research was secured by snowballing. This method proved very beneficial given the constraints surrounding voluntary participation in research studies, and for public service employees. The constraints surrounding voluntary participation influenced the time horizon for this research, in that only available and willing participants could only be used. Therefore, a cross sectional approach, whereby data collected from on specific point in time was used. In terms of organisational learning, a longitudinal approach is generally preferred whereby changes in organisation values, mission statements and strategic focus can be evaluated over years in relation to evidence for a learning organisation are apparent over time. However, this was not possible and the number of years' experience of participants was used to gauge change over time. The interviews were conducted from September 2021 – October 2021.

3.4.2 Data collection methods

The following section provides an overview of the data collection methods chosen for this research.

3.4.2.1 Literature review

According to Bryman (,2012:14), the literature review explains the process whereby published research that relates to the subject and theoretical understandings being investigated is critically examined. Bryman (2012) further explains that the literature review aims to establish a context of what is already known and the concepts that have been applied to the subject to understand the current debates and discourse within the arena of interest. Through this critical evaluation, the researcher can position their interest within the realm of published works and investigate or contribute to further the understanding of the subject and/or identify gaps in the particular field.

Key literature used in this research was sourced using a general search for the terms “EIA and learning”, “organisational learning”, “learning types” and “public sector learning” on Google Scholar. Results which illustrated numerous citations were reviewed for their applicability to the current research. Thereafter secondary sources were selected by perusing the bibliographies of the chosen key literature.

The literature review provided an understanding of learning types in psychology and educational research, this delineation was then complimented by the review of organisational learning

concepts and theory. This literature review then concluded by bringing in together the observed and published perspective of EIA participation as a learning mechanism. The literature review highlighted the types of learning possible and mechanisms of how learning can be gained through EIA participation. The outcome of this chapter enabled the adoption of a conceptual framework in which this research was based and carried through to the semi-structured interview questions. The conceptual framework adopted for this research is explained in Section 2.4. and builds on theoretical frameworks in the published literature. The outcomes of the literature review will provide a partial answer to the research sub-question 1; *What are the opportunities for organisational learning within the South African EIA process?*

3.4.2.2 Semi-structured interviews

Before formulating the research question and the research sub-questions, the researcher reflected on the following questions in order to properly focus on the relevant issues comprising the research. *What do I want to achieve? How will I undertake the research? and, how do the learnings gained from EIA participation influence broader organisational learning?* These questions, coupled with the adopted proposed conceptual framework (as described in earlier sections) allowed for the sculpting of interview questions in a narrowed focus. Further to this, the interview questions were designed in accordance with the four main steps of the conceptual framework of this research; (1) information acquisition, (2) information interpretation, (3) information sharing and, (4) organisational memory.

Bryman (2012:55) explains that semi-structured interviews allow researchers to keep an open mind through the interaction and can allow for concepts and theories to emerge from the data. For this research, the use of semi-structured interviews was justified because flexibility was required to probe for richer context and information in participant responses. This proved valuable because probing on emergent themes allowed for a comprehensive inventory of personal experience to be built. The semi-structured interview questions were formulated and administered according to the conceptual framework adopted for this research. Each question was designed to draw out experiences with regard to key organisational learning concepts, and these interviews were administered to a total of fourteen voluntary participants. The sample population comprised of both commenting and competent authorities at both provincial and national departments. A sample of the semi-structured interview questions is provided in Table 3-2.

Table 3-2: Semi-structured interview questions

What is the influence of participation in environmental impact assessment on organisational learning from a regulator perspective?	
A. Investigating EIA and learning.	What is your view on the potential of learning through EIA participation in general?
	Please explain who you think can learn from participation in the EIA process.
	Which stages or aspects of the EIA process do you believe has the potential to derive the most learning for regulators? Please explain.
B. Investigating what has been learnt (learning outcomes) through EIA participation.	In what capacity have you participated or been involved in Renewable Energy EIA processes?
	Have you developed new skills or knowledge through your participation in EIA for renewable energy projects when compared to traditional energy or developmental projects? Please elaborate on the skills or new knowledge, and at which point in the EIA process this was gained
C. Investigating how learning permeates through the organisation.	How is knowledge or new learnings gained through EIA participation shared within the organisation?
	What resources are available within the organisation to help you acquire new skills regarding renewable energy projects? Do these facilitate further understanding of Renewable Energy projects? <i>Resources may include internal and external training (courses, review of academic literature, news, databases, and GIS tools), informal means (transfer of knowledge and experience from colleagues), prescriptive means (checklists, guidelines, and legislation) or a combination, formal training.</i>
D. Have learning outcomes gained through regulator participation in EIA been used to influence organisational learning?	Can you think of an example where you have been able to use/ or apply the lessons you have learnt during your participation in renewable energy EIA process for other projects or to streamline procedural processes?

What is the influence of participation in environmental impact assessment on organisational learning from a regulator perspective?	
	Are you aware of instances where there has been a change (thinking, behaviours, ways to undertake tasks or procedures) within your organisation as a result of gained learning through the EIA process?
	Is there strong evidence of better department relations, development of otherwise absent expertise, learning, new partnerships, and better public-private-voluntary sector communication as a result of EIA

3.4.3 Data analysis techniques

Data analysis was done by coding, which is analysis of transcribed data and dividing it into meaningful units by assigning segments of data with symbols, descriptive words, or unique identifiers (Nieuwenhuis, 2016). According to Saldana (2014), “*coding will function as a way of patterning, classifying and later reorganizing the data into emergent categories for further analysis*”, which will enable data with similar themes to be examined together. The following steps were undertaken to analyse the data.

- Recording of interviews (through voice recorders, or MS Teams);
- Transcription of interviews:
 - Word by word transcription was done to obtain a raw transcription copy;
 - Cleaning of the transcription was done by removing irrelevant introductory content which had no bearing on the interview. This was done to allow for easier handling for coding.
- Coding:
 - Interviews were first read-through for accuracy and were formatted to allow for easier identification of themes or notes. The interviews were handled by pawing through the content to strip out ideas, or content relevant to the research aims, literature review and research questions. Thereafter line by line coding was done to review any new ideas and thoughts.
 - Collation of all identifying codes was then collated on an Excel sheet and grouped according to similarity by the use of colour. These colours were then consolidated and refined to produce the final codes.

- Reporting:
The codes were refined and grouped according to the specific research questions. This information was then checked against the research questions and literature to form the discussion.

3.5 Delimitations of the Research

The following section provides a description of the choices and assumptions which were made by the researcher when carrying out the research.

- This research is aimed at determining if EIA participation influenced learning and does not delve into the internal structure and characterisation as a learning organisation.
- This research is limited to perceptions of learning acquired through EIA participation through the answers provided by participants. Because there is no investigation and analysis of internal training policy documents, determination of transformation with regard to internal culture, structure and behaviours cannot be accurately captured.
- The constructs evolved from organisational learning theory was adopted in this research. These were used in tandem with traditional learning types and outcomes of learning observed through the EIA process, as identified by the literature review.

3.6 Limitations of the research

This section provides the constraining factors and influences which could not be controlled whilst undertaking this research.

- The population sampled for this research was largely dependent on the availability of participation. It was found that the bureaucratic processes involved with obtaining approval for participation caused significant time delays for this research. In addition, observed fear and hesitancy regarding information disclosure of public service organisations severely restricted the ability of this research to focus on just one regulatory department. In order to mitigate against this, the researcher approached both commenting and competent authorities and maintained anonymity for participants. When reporting results, provincial departments were not individually named. All participants were kept unnamed.
- Participants who opted to provide a written response would limit the research by the inability of personal interaction to draw out other interrelated topics which could be done during a live interview. However, this is not a fatal flaw because the participant would have

contributed the information, they deemed valid and sufficient to represent their perceptions.

- The small sample size realised for this research may present a limitation to the generalisability of the findings of the research. However, given that the research was focussed on individual perceptions, the sample size of 14 individuals was not considered fatal flaw because the findings presented an adequate starting point to indicate organisation learning through individual participation. It should be noted that the research should be considered only then from the regulator individual perspective and not a representation of all regulators involved in the South African EIA process.
- The time frame adopted for this research was limited to the available time of the academic year, as well as the availability of participants. A longitudinal approach could not be undertaken due to this constraint. However, the focus of this research was adapted to accommodate the cross-sectional approach, by focusing on the perception of learning from EIA participation through personal experience. Therefore, more physical evidence of knowledge repositories, change in organisational culture and mission statements over time were not required for this research.
- The researcher acknowledges the possible limitation of voluntary participation for this research, with regard to the introduction of biased or skewed sample population. Voluntary participation could be linked to positive feedback bias, in that only positive and affirmative responses may be given to represent the situation in a more favourable light. The researcher was aware of this possibility during the interviews. However, it was found that participants were critical in their responses and provided constructive, objective feedback often supported with examples.

3.7 Ethical considerations and procedures

Ethical clearance was obtained for this research in accordance with the North-West University ethical clearance processes. The research was deemed as a low ethic risk; however, the researcher successfully completed the mandatory ethics training courses prior to undertaking any interactions with the sample population. The ethics training certificates are included in Appendix B. Given that this research is firmly based in the individual participant experience, it is imperative that the rights of the participants were protected at all times. In addition to this, a strongly developed ethical procedure enables allows for scientific integrity and validity is maintained, thus mitigating against bias. The following was followed in order to maintain the ethical integrity of the research process.

3.7.1 Voluntary participation and informed consent

It is important that the participants do not feel coerced or trapped when participating in the research process, as this may skew the answer given due to a sense of fear or obligations. As such all participation should be voluntary. Potential participants were identified as described in Section 3.4.1 and participation was firmly voluntarily. The participants were issued a copy of the consent form (Appendix A) and semi-structured interview questions prior to the arranged interview. The consent form clearly indicated the participants right to withdraw from the research at any time. All benefits, research purpose, risks and financial details was explained in the consent form and verbally to participants. As a precautionary measure, participants were also asked prior to the interview beginning, if they still consented or had any reservations.

3.7.2 Confidentiality

All participants were kept anonymous as part of this research. This was done to limit any potential negative perceptions of efficiency and performance of the regulator themselves, or their place of work (department). All personally identifiable information was anonymized during the final transcription process and demographic information was made generalised to capture the entire sample population. During the interview process, some participants chose to substantiate answers with personal experiences and confidential examples. In these instances, information was summarised in the context of the information relevant to organisational learning and the research. All confidential names, cases and scenarios were excluded from the results write up.

3.7.3 Prevention of harm

The research topic was considered a low risk in terms of ethics considerations, however there was no potential for social, psychological harm as part of this research.

3.7.4 Plagiarism and misconduct

This research was checked for plagiarism using the mandatory North-West University software and was found to meet the required standards. All interviews were recorded (with the participant's consent) and was transcribed word for word and checked against the recordings after transcription. Copies of the recordings are kept by the researcher for quality purposes. The results were coded according to similarities and themes, which can be cross referenced with the interview raw data.

CHAPTER 4 RESULTS AND DISCUSSION

4.1 Chapter introduction

The purpose of this research was to investigate the influence of regulator participation in the South African EIA process on organisational learning with regard to renewable energy projects. The research adopted a conceptual framework which was based on key elements required for organisational learning to occur. The outcomes of the research were to determine if regulators perceived to have learnings through their participation, and if these perceptions and learnings were carried throughout the organisation and used for the future decision making.

Semi-structured interviews which were administered to a total of fourteen voluntary participants was designed to probe responses pertained to the two research sub-questions; (1) What are the opportunities for learning within the South African EIA process? and (2) What has been learnt by regulators through their participation in renewable energy EIA? Answers to sub-question one was partially answered through the literature review, but participant responses were found to anchor these results in theory. Answer to sub-question two was identified from the interview results. Results answering both sub questions one and two are presented in this chapter. Collating these results enabled the researcher to gather evidence to the answer to main research question which was, what is the influence of participation in EIA on organisational learning from a regulator perspective?

This chapter begins by first introducing the reader to the demographic of the sample population in Section 4.2, the chapter then flows to the results of the semi-structured interviews in Section 4.3 and was arranged in a manner which would incrementally introduce evidence for or against the occurrence of organisational learning through regulator participation. Section 4.3.4 collates these findings to meaningfully answer the main research question.

4.2 Demographics of sample population

The results of this research were based upon a total of 14 participants who were sampled as per the sampling strategy explained in Section 3.4.1. The demographic information of the sample population was obtained through the interview process and aimed to provide an overview of; (1) the participants regulatory role within the context of South African EIA administration; (2) the number of years of experience of participants as regulators; and (3) education and training obtained by the sample population.

The categorization of participants in terms of their function as regulators is represented in Table 4-1 below. There was an equal split of participants who are tasked with duties as a competent

authority (7); and the remaining participants play a commenting role. However, one participant has multiple roles in the Department as a competent and commenting Authority and is also responsible for Education and Training (Participant 4). Another participant was responsible for playing a role in Policy and Planning as well as a competent authority (Participant 3).

The distribution of commenting authorities was split between provincial departments (4), specialist commenting authority (South African Heritage Resources Agency (SAHRA)) (1), and Quasi-government organisations who are involved with economic development and planning at a provincial level (2).

The years of experience of participants are tabulated in Table 4-2 below. The majority of the sample population had more than 10 years of experience as a regulator and dealing with EIAs. Three participants did not disclose their years of experience. It was found that all participants were formally qualified and were in possession of Higher Education degrees.

Table 4-1: Categorization of the sample population roles/function as regulators in the South African EIA process

ROLE AS REGULATOR	NUMBER OF PARTICIPANTS	DETAIL
Competent Authority	5	National Department (5)
Competent & Planning and Policy	1	National Department (1)
Competent, Commenting & Education and Training	1	Provincial Department (1)
Commenting Authority	5	Provincial Departments (Environmental Affairs) (4) Specialised commenting body (SAHRA) (1)
Commenting, Development and Planning (Quasi – Government organisations)	2	Eastern Cape Development Corporation (1) Development Corporation – East London (1)

Table 4-2: Categorization of the sample population used in this research

PARTICIPANT CODE		ROLE	YEARS OF EXPERIENCE IN EIA	FORMAL EDUCATION
Participant 1	P1	Commenting, Development and Planning	> 10 years	Yes
Participant 2	P2	Commenting Authority	Undisclosed	Yes
Participant 3	P3	Competent & Planning and Policy	> 10 years	Yes
Participant 4	P4	Competent, Commenting & Education and Training	> 10 years	Yes
Participant 5	P5	Competent Authority	5 – 10 years	Yes
Participant 6	P6	Commenting Authority	Undisclosed	Yes
Participant 7	P7	Commenting Authority	> 10 years	Yes
Participant 8	P8	Commenting Authority	5 – 10 years	Yes
Participant 9	P9	Commenting, Development and Planning	> 10 years	Yes
Participant 10	P10	Commenting Authority	Undisclosed	Yes
Participant 11	P11	Competent Authority	> 10 years	Yes
Participant 12	P12	Competent Authority	5 – 10 years	Yes
Participant 13	P13	Competent Authority	0 - 5 years	Yes
Participant 14	P14	Competent, Commenting & Education and Training	> 10 years	Yes

4.3 Results of semi-structured interviews

The research results were obtained by analysing participant responses to the provided semi-structure questions. Participants were given the choice to either provide a written response or to consent to a virtual interview. Three participants chose to provide a written response to the semi-structured interview questions. The remaining eleven participants chose to participate in a live interview held via two mediums; telephone call (4 participants) and over MS Teams meetings (7 participants). All interviews were recorded by a cell phone, voice recorder or by the MS Teams application. Interviews were transcribed by word by word transcription (raw data). Once transcribed, the interview responses were analysed, using rudimental scanning, categorization, and coding where a frequent theme or category emerged. These results are discussed below.

4.3.1 What are the opportunities for learning within the South African EIA process?

The theoretical opportunities for learning within the EIA process was identified in Chapter 2 of this research, via the literature review. As a supplement to the theoretical findings, the semi-structured interview questions were designed to obtain a baseline description of the participant perceptions of EIA as a tool to promote learning. In addition, participant responses were categorized according to the taxonomies of learning in impact assessment postulated by Sánchez and Mitchell (2017:196), as introduced earlier in this research. This proved useful in anchoring the responses to the conceptual framework and theory used in this research.

4.3.1.1 Determining a baseline of regulator perceptions

In order to contextualise the participant experience, it was useful to identify a baseline of the possibilities regulators believed could be possible from EIA participation. This was done questioning participants on the potential for learning as well as who and what can be learnt from the EIA process as described by Sánchez and Mitchell (2017:196).

4.3.1.1.1 Is there potential for learning through EIA?

As a starting point, the participants' perception on the potential of EIA to promote learning was unanimous, whereby all participants indicated that EIA could promote learning. Some participants responses did not explicitly state that there is potential for learning in EIA, but instead, described who can learn and what can be learnt, in the EIA process. Therefore, it was logical to accept that these participants believed there is potential for learning through EIA.

The use of emotive adverbs and language by participants 1, 3, 5 and 14 indicated that there was little doubt for the potential of the EIA process to promote learning. Participant 1 exclaimed, *"Yes, absolutely! My answer to that question is yes, there is potential for learning, absolutely!"*; whilst Participant 3 stated, *"Yes, I think the EIA will create learning definitely"*; Participant 5 stated, *"Yes, I fully agree that there is a potential to learn"* and Participant 14, *"Yeah, definitely there is, without doubt"*.

4.3.1.1.2 Who can learn from the EIA (South African) process and what can be learnt?

Six participants (P8, P9, P10, P11, P12 and P14) expressed the opinion that everyone; i.e., all role players in the EIA process can learn. However, the other role players who were identified as having the potential to learn included the regulators (included in 11 responses); I&APs such as communities, public, environmental management students, NGOs (included in 8 responses); applicant or developer (included in 6 responses); EAP (included in 5 responses) and specialists (included in 2 responses). The participants justified their answers with a description of what can

be learnt by these role players. This is drawn out in more detail according to separate categories. For ease of reference, the potential of the regulator to learn as part of EIA participation, will be discussed under Section 4.3.1.1.3. This is due to the overlap of responses given by participants, and the perceptions of regulator learning as a focus of this research.

1. Category 1 – Learning for I&APs

The EIA process was identified as a valuable opportunity for I&APs such as communities, the general public and NGOs to learn in the EIA process. The responses received were ordered according to four themes; (1) contribution made by local communities to the EIA process; (2) missed opportunities for learning; (3) learning dependencies and; (4) the potential of I&APs to learn through their participation in the EIA process.

- Contribution to the EIA process

Responses in this theme identified the value of local communities for contributing to learning during the EIA process. This value was distinguished by participants as the contribution of local and indigenous knowledge to; broaden thinking; inform mitigation and management measures; to affect the planning processes and project design, and to identify unbiased and objective issues.

Participant 7 is a commenting authority for the SAHRA and explains that the contribution of local communities to the EIA process can expand and change the way of thinking of role players in the process. This is by identifying things that were previously unknown or not assessed.

“Yes, the public, their comments sometimes open up a whole new way of thinking that you didn’t note before. You know, they live in an area for generations, and they have noted something, I can’t think of an example, but something that no one took into account that hasn’t been assessed and hasn’t been taken into account. So, I think, the public, the local stakeholders, local municipal workers, they know the area and there you tend to miss even small bits of information that can make a difference.”

Participant 14, a competent authority in the national department, recalls an example of the contribution of indigenous knowledge, which was used to identify graves, which were not identified by the heritage specialist. This resulted in the project being put on hold for further investigation. This contribution affected the management and mitigation measures of the project. The participant also identified that there will be missed opportunities if the public participation process is not undertaken adequately.

“So, you can’t see it unless you have the history of that being passed from one generation to the next, and that’s when the developers noticed that, oh actually we nearly made a mistake, and they have to take that into cognisance. So yeah, you’re right so that’s why I’m saying sometimes when you do public participation, we will do it to meet the bare minimum requirements as per in the regulations, but we actually tend to neglect and ignore, maybe not intentionally,

some of the important, very, very critical significant information like this one I'm telling you about now."

Participant 4, a competent authority at provincial level, indicated that input from local communities such as immediate neighbours are critical contributors to the process in terms of planning and development as per the following response;

"So that's my primary one and that's because I'm doing this here, so I picked it up. Then the other interested and affected parties for me would be your, your immediate neighbours to a development site, your local authorities – that's crucial, especially your planning people."

The participant further explains that the local authorities and neighbours will be able to provide input in terms of planning restrictions and thereby influence your project design. Lastly, Participant 11, a competent authority at national level, stated that the local public can provide comments which are unbiased, as a contribution to the process.

"Yes. Especially because people have nothing to gain or lose by lying, more than the EAP because the EAP is paid to write everything as if it is all good so that they can get the project underway. But the people who are in and around are not going to lie because they have nothing to hide."

- Missed opportunities for learning

The interview results indicated that regulators believed that there are missed opportunities for I&APs which can affect the EIA process and learning. The themes identified were, (1) exclusion of certain stakeholders groups through inadequate public participation and (2) learning dependencies.

Two participants (both of whom are commenting authorities at a provincial level) expressed the opinion that, the degree of learning varies for certain groups. Participant 2 expressed the concern that the current EIA process can exclude the vulnerable groups (special needs, illiterate, disable groups), with little tools currently available to accommodate and facilitate communication.

"However, forms of communication for understanding needs to be expanded to accommodate people with communication disabilities, illiterate and people with special needs."

Participant 6 explained that there is a missed opportunity for vulnerable groups (suffering from low literacy, or poor communities) to learn if not adequately facilitated by the role players in the process, in addition, the participant indicates that there could be missed opportunities for regulators to learn and missed contribution of the unique insight these groups may have for the process.

"Since..... more vulnerable and poor communities may suffer from pre-existing conditions such as low literacy levels and generally being unaware of pressing environmental issues, key authorities should take on a role as a facilitator to enable such communities to learn

about environmental issues. At the same time communities who have their own inherent and unique qualities and approaches to resolve environmental problems should be enabled by decision-makers to share their experience so that decision-makers, including regulators learn how local communities wish to see their own environmental problems being resolved or responded to."

This opinion is echoed by Participant 14 who identified that there will be missed opportunities if the public participation process is undertaken inadequately.

"So, you cognisance. So yeah, you're right so that's why I'm saying sometimes when you do public participation, we will do it to meet the bare minimum requirements as per in the regulations, but we actually tend to neglect and ignore, maybe not intentionally, some of the important, very, very critical significant information like this one I'm telling you about now."

Another contribution made by Participant 11, is that the EIA process and learning can be influenced by how vocal the communities are in public participation process, which introduces limitations to the EIA process due to missed learning opportunities and increases the reliance on the information provided by the EAP.

"But it also depends on how vocal and involved the public in that particular project are. Some projects you find that it's a very big project, it's a very serious project but the people in and around that proposed project are not really vocal. They don't want to participate for whatever reason. So, it short-changes the project then because I'm going to have to rely on what the EAP says."

- Learning dependencies

Three responses indicated that learning by I&APs were dependent on their specific interest which dictated the degree to which they remained in the process, and the motivation for learning. Participant 12, a competent authority for the national department (DFFE) highlights that the general community is interested in what they can get out of the project in terms of jobs as their primary interest.

"But now you see with the general community, most of the time when the community participates in an EIA process, what they are almost always interested on, is jobs, right? Job opportunities. That is the first point which is for me the bigger commitment. Because people they want jobs, so when they hear about the project, that's the only interest that they have."

This opinion was shared by Participant 3, (a regulator at the national department who was responsible as a competent authority and for the development of national planning and policy) who indicated that learning for stakeholders is dependent on their interest, curiosity, impetus for further inquiry as well as the personal effect the project has on them.

"If your interest is peaked, I think you could decide. If you were drawn to the technology or didn't like the technology, you could read and in both situations you would learn. So, I think from the point of view of a stakeholder you could be impacted by a turbine or...I definitely think you would learn. Unless you were pretty switched off and you weren't really interested"

One participant (Participant 9), who is a commenting authority for the Industrial Development Corporation, expressed the view that the I&APs learn the least due to their lack of specific interest or contribution to the process. This response was the only comment received of this nature. The response conveys a belief that the dependency of I&AP learning was emotional and uninformed.

“But I&APs, they are probably the ones that learn the least, you know, they don’t have to learn. If I’ve got interest in this sort of interest in a project as I &APs I don’t really have to learn from the whole process. What I should be learning though is, is how the process works. So, you don’t waste the authority’s time. And the EAPs time, with silly questions or emotional objections or what have you.”

2. Category 2 – Learning for EAPs

The potential for the EIA process to facilitate learning for the EAPs (consultants) was identified by three participants (P1, P4 and P5). Generic EIA reports which are comprised with copy and pasted sections of other EIA reports, were frequently observed during Participant 1s’ professional career. The phases for learning through EIA was acknowledged by P1, in that, the lessons learnt are believed to have the potential to change the consultant’s way of thinking, in line with the shift in focus for the protection of the environment.

“And I think your four different phases is what’s important, the learning and then how to actually internalize that. And then whether indeed you’re going to implement it because over the years there’s been so much focus on paperwork and not actually implementing what’s on the paper and as an environmental manager, I have seen it years and years and years where the same sentences are used in almost all EAPs documents and especially in environmental management plans. And it’s literally just cut and paste, and I would love to see what percentage of that cut and paste is actually transformed into practical implementation, on the job does it actually add value?” and *“The applicant certainly has a lot to learn, and I believe the consultants do as well and just to think in a different way.”*

Participant 4 and Participant 5 shared their views that through engagements with the regulators, the EAP has an opportunity to learn about aspects which are unfamiliar to the EAP. Participant 4 states that the regulator can alert the EAP about local happenings which may not be otherwise known and can therefore affect the way in which the EIA is undertaken. In the example provided, the EAP was physically based outside of the region for the proposed project and may not be aware of local socio-political changes.

“So, I said, who’s the person that you spoke to the municipality, and they said so and so. And I said, okay, so the consultant is based here in the Bay. But the fact that you’re based in the Bay, you should be very aware of it that the person who you sent the email to, in terms of their public participation processes, has been fired for corruption, ‘cos it was frontline news. So, they said they didn’t realize that.” and

“So, when you based up in Johannesburg, and you doing work here..... you may not readily be able to access I&AP database list.” and; *“So, from a learning perspective, the EAPs are crucial I&APs in the process if I could call it that.”*

Further to this potential learning for EAPs, Participant 5 contributed that the engagement between the regulators and EAPs allowed for mutual learning. In so far as the EAP can learn from regulator comments and broaden their knowledge which may have not have otherwise known.

“I think it's a two-way street. So, it's going to be... I think it's actually the applicant and the yeah... The applicant and the EAP on that one spectrum, and us on the other spectrum. So, there's actually learning for both parties involved. Because you may have, for example, like, like with you said that you're dealing specifically with mining, right? And if I haven't dealt with mining, but when we engaged during the pre-app or during the EIA process, there'll be knowledge sharing where your experience in that sector or that field will be shared to me. Whereas, if you... If you then deal with an application that that is in my forte, right? That is an experience that I have will be then passed on and shared onto you, and then if there's any limitations and gaps that we know, we both end up learning from that experience.”

3. Category 3 – Learning for applicants

Four participants (P1, P5, P6 and P7) reported that there is a potential for applicants (or developers) to learn through the EIA process. This learning was believed to be achieved through cooperative engagement with regulators (P1 and P6), communities (P7) and through the entire EIA process (P1). The outcomes of the engagement with regulators included; broadening knowledge about the EIA process and a change in thinking and understanding of different views and regulatory constraints, all of which could affect project design and planning. Participant 1 conveyed that applicant rarely understand the purpose and process of EIA and participation in EIA, can close the knowledge gap through internalizing the learnings. Participant 5 shared similar sentiments in that the learning is a two way street for regulators and EAP and applicant.

Responses from Participant 6 and Participant 7 shared similar opinions to each other by highlighting the opportunity for applicant learning to effect a change, more so a change in project design or to adapt and correct actions for the future projects. A direct quotation from P6, illustrates that through engagements with regulators, applicant learning could contribute to pre-emptive planning.

“Regulators in this sense may get to learn and view how other professionals (and sometimes together with their project applicants) decide on how the project should be designed so that it meets their clients' needs but also adhere to the EIA requirements, and most notable ensure that the project does not lead to devastating consequences or negative impacts on the environment which can be avoided.”

Response obtained from Participant 7 indicated that in applicants (referred to as developers) could learn from local communities and EIA process (experiences) to change future actions.

“Opportunities for developers to learn from previous EIA failures to find corrective actions, and I think also the clients. Whoever the main developer is, let's say it's mainstream for example terms such as your social license to operate in an area. Learning from your community and

learning from other EIA processes to see where they went wrong. And how to do things better and to understand how the community in a specific area may react to your development.”

4. Category 4 – Learning by specialists

Although not a frequent response, three participants (P4, P12 and P14) indicated that there is also a learning opportunity for specialists involved in EIA process. This could be achieved through engagements (public participation and regulator) and could produce improved technical knowledge (development of guidelines, improved knowledge about site specific conditions such as cultural heritage and improved specialist report quality).

Participant 14 indicated that specialists could also learn about local cultural heritage through public participation engagements, thus broadening their existing knowledge in line with contributions made by local communities (as discussed in 1 above).

Participant 4 emphasises the importance of the regulator knowledge to be shared with specialists, who may not be familiar with the area or current situation. This is evident from the quote below which showed that the engagement with the regulator would have assisted the specialist to improve their local understanding and obtain a correct representation of the area. In this way, the specialist can learn.

“If for example there’s operator that’s outside our region, and he or she says no we shouldn’t be doing a wetland study. They may not even have done a site visit to make that determination to know what’s on the ground... and he said there isn’t any wetlands there, just a couple of drainage lines here and there. Then we said okay, fine... but I knew for a fact there were wetlands, I said you’re seeing a site that doesn’t have wetlands, but you’re not taking into consideration the fact that we’re in a drought situation. So come tomorrow or a months’ time, those wetlands are going to rejuvenate. And that was through a specialist, so his argument was no we are currently assessing the now, not the future. Then I said no that’s not the way you assess. In my opinion your development will have impacts going forward. You need to consider that in terms of how you going to manage stormwater runoff etc, etc from that property. And if you need to rework your design and infrastructure design so, be it.”

NGO groups, commonly involved in the EIA process include persons of specialised knowledge (for example BirdLife South Africa). These groups according to Participant 12, could learn from EIA by using the information gained during participation for developing industry guidelines. This insight was the only one of its kind received as part of this research.

“So, Birdlife South Africa is interested in the impact on birds. So, when they participate in the EIA process, what they do is they actually use that information, about what the project is about. Let’s say a wind farm, right, so they can use that information that they get there to sort of develop guidelines... “So, guidelines for future developments and guidelines for specialist studies that look at avifauna, which is the impacts on bird life.”

4.3.1.1.3 What stages in the EIA process do regulators believe they learn the most?

Opportunities for regulator participation in the South African EIA process were identified in Section 2.3. As part of this participation, regulator inputs are required during the scoping, assessment, review, monitoring and auditing stage; whilst the screening and decision making stages provide opportunities for regulators to influence decisions. Question A3 of the semi-structured interview was aimed at understanding the participants' perspective, of when they gained the most learning. The stages of learning in EIA, as identified by the participants, are represented according to the frequency of occurrences in participant responses (Figure 4-1). It must be noted that participants provided more than one response (stage for learning) for this question.

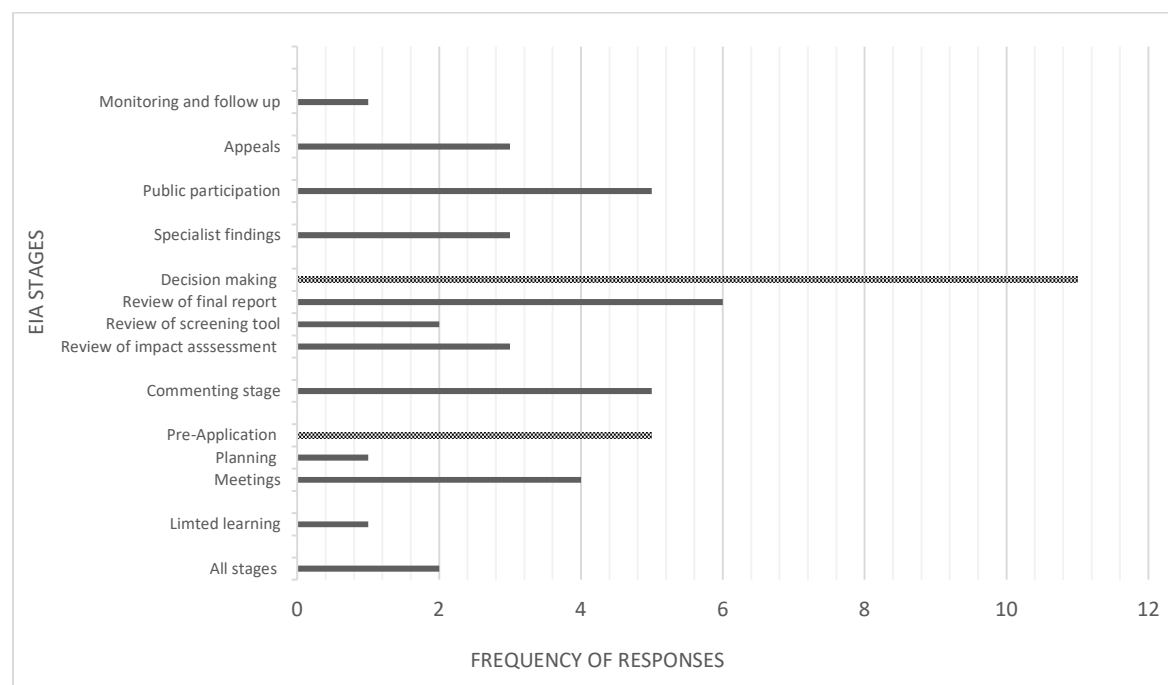


Figure 4-1: Regulator perceptions - potential learning stages in the EIA process

The decision making stage was the most frequent response (occurred eleven times), in which the review of the final EIA document was viewed to provide the most value for regulator learning (included as part of 6 responses). This is because all the information gaps which were identified at the initial EIA stages are addressed, in addition, public comments will be included in the final EIA document as well as the responses provided by the EAP and applicant. The six responses indicated that the participants valued looking at the project as a whole. Three participants indicated that they had learnt about impacts and mitigations for renewable energy projects, thereby differentiating them from other projects. The use of the mandatory DFFE screening tool

was cited by two regulators to provide information regarding the site sensitivities of the areas of the proposed project and would then inform regulators of what specialist studies to check for.

Five responses indicated that the non-legislated, pre-application stage held the benefit of engagement for regulators, EAPs and applicants. During this stage, regulators perceived the pre-application meetings (4 responses) to identify knowledge gaps and ask questions about the specific project. One participant (P5) expressed the opinion that there is a two way flow of learning from the regulator and the applicant (EAP included) whereby all parties can impart new knowledge from their personal experience. Participant 5 also indicated that the follow on specific queries raised during this stage, allowed for further reflection and research on the part of the regulator. Participant 13 shared personal experience of sitting in on the pre-application meetings as a way to share information and also retain institutional memory. One participant, P8 noted that this stage also afforded the opportunity to identify gaps which affects planning.

The potential for regulator learning through public participation received five responses. Regulators perceived benefit in learning about I&APs through the review of comments and concerns through the review of the EIA report. The regulators believed that the public participation allowed for identification of the contribution local communities can make to the EIA process. This was discussed further in previous sections.

Three regulators noted learning from the appeals process. One participant, P4, shared their personal actions taken when handling appeals. When an appeal is received, P4, engages in thorough self-research and investigation to respond to the appeal given. Thereafter, the participant engaged with colleagues for advice and review. It can be noted that in this instance the appeals produced acted like an initial trigger, the learnings that followed was dependent on personal impetus. Other comments were received by P14 and P12 regarding the appeals stage for learning. P12 mentioned that there is potential to learn from appeals but that it is limited. P14 did not explicitly cite the appeals stage as a means of learning but did respond that insufficient public participation leads to appeals, this led the researcher to interpret the potential of an appeal for learning, to improve future actions. In contrast to these responses, Participant 7 (a commenting authority for the SAHRA), expressed the opinion that learning through appeals is very limited for a regulator in that specific role. This is because there are no feedback loops to the heritage agency once a project is uploaded onto the South African Heritage Resources Information System (SAHRIS) system as a draft.

Specialist studies (undertaken as part of the impact assessment phase) present an opportunity for regulators to learn about new technologies and findings, especially in relation to renewable energy projects (P4, P13 and P14). Participant 14 distinguished the link of learning from the DFFE

screening tool, to identify the studies required, whilst the EIA report is reviewed to ensure compliance of required studies. Further to this, the specialist input into the entire EIA process was viewed as beneficial knowledge contributions.

The commenting stage of the EIA process is experienced differently for provincial commenting authorities and national competent authorities (DFFE), in practice (personal understanding through researcher professional experience). This is because the competent authorities at a national level do not typically attend public meetings. Instead, these regulators engage directly with the EAP (and applicant) and review the outcome of the PP processes, through review of the comments and response reports. Provincial authorities may be invited to commenting authority meetings during the application phase and provide comments as the process progresses.

Provincial commenting authority, P8 stated that the commenting stages enables regulators to learn. The participant specifically cited the identification for opportunities of biodiversity offsets to be considered. Participant 9, a commenting authority concerned with the promotion of industrial development, learnt from public participation responses obtained during the commenting stage. The participant specifically raised the example of experience gained in reviewing comments to ensure consistency for organisational requirements and best practice. Participant 5, a national competent authority, talked about the collaboration possible between commenting authorities and the national department, and the ability for themselves to learn from the commenting authorities during review of the comments and responses report. Regulators from the national department (P12, P3 and P14) shared the view that learning from comments obtained during the commenting stages enabled regulators to gain insight of perspectives of stakeholders which would not have otherwise been revealed.

The potential for learning from monitoring and follow-up was identified by Participant 14 as a mechanism for feedback and learning. This was the only response of its kind, which indicated a feedback loop between audit findings and national competent authorities. This outlier was validated by the participant by stating that when authorisation conditions are not implementable, then this feedback is received from the Compliance section to the department within which P14 works.

The iterative nature of the EIA process was cited to be a source of learning for regulators, whereby P14 and P10 state that the entire process could yield learning for regulators. P14 refers to the stages as the brewing stage, where the process evolves and unfolds. P10 indicated that all stages are critical, and no stage can be viewed in isolation.

The perceptions for regulator learning through EIA stages were indicated above, however the perception of one participant (P3), was that regulator learning is limited. These limitations, according to P3 included the routine roles of competent authorities (in the DFFE) as well as the prescriptive checklist required for assessing compliance to authorise decision making;

“So, you’re looking at things from a different view. You’re looking at things like: “Did you answer all the comments,” “Did you have enough consultation,” “Did you advertise well” so the questions are a bit different. I really do think it becomes quite routine. So, I’m not sure that you really learning a whole lot. I think once you’ve seen the technology once or twice, I think you’re not really learning from the technology either. I think the whole thing becomes quite routine. So, my personal view, if the regulator is learning from the actual participation process, being part of the EIA, I think maybe in terms of the first few, but it becomes routine after that so no I wouldn’t think that you are on a constant learning curve in EIAs if you are a regulator.”

4.3.2 Identifying internal structures required for organizational learning

The internal structures of an organisation provide an integral platform to facilitate organisational learning. Information sharing methods and organisational memory play a crucial part in determining how knowledge is distributed and embedded within an organisation. An analysis of the interview responses revealed interlinkages between information acquisition, the mechanisms for information sharing, and subsequent embedding of knowledge. Therefore, it can be noted that the internal structures available within an organisation can facilitate the capacitation and training of members, thereby impacting the overall availability of skills and knowledge within the organisation. The semi-structured questions C1 and C2, was aimed at revealing the mechanisms in place, for knowledge sharing and organisational memory within the participant’s respective organisations. The description of the sampling strategy and the demographic information of participants used in this research was presented in Section 3.4.1 and Section 4.2, and responses to questions C1 and C2 was separated according to provincial and national departments.

4.3.2.1 Information acquisition, sharing and organisational memory for regulators at the provincial level

4.3.2.1.1 Sources of information

- Building capacity and training

Formal sources of information cited by participants included access to technical training workshops and forums (including working groups), sponsorship for formal studies (courses and degrees), and research or trainings institutes. Access to technical training workshops was reported by three participants (P2, P4, P6 and P10), all of whom cited the stakeholder engagement and refresher training with the national department (DFFE) with the provincial department as a means of gaining information about legislative updates. Participant 6 (P6)

pointed out that access to training workshops hosted by other authorities is by invitation only and are restricted to specific designation.

Technical training is also available from industry specialists and NGOs such as SANBI, as well as through affiliation with local universities to gain access to academic forums, as documented by a response from P4.

“NMMU has the thicket forum, and that’s part of SANBI and a group of scientific entities that basically talks to the management of thickets, and it might be important and so forth. And that’s a free it doesn’t require us to pay it. We participate.”

Participant 4 holds a senior position which requires attendance to technical forums such as the Environmental Quality Management (EQM) technical forum, in which the information from the Working Groups (at head office) is presented to the regions through three-day long workshops which were available prior to the COVID 19 pandemic.

“Internal stuff, we’ve got these, or we used to have these things. Where we have like a three or four day workshop session. So, day 1 would be EQM stuff, environmental management stuff, then day two would be coastal management stuff, so you’d have different regions bringing in different scenarios, different real life scenarios.”

Similarly, to P4, commenting authority P2, recognised information sources from technical forum on climate change and environmental forums held by the District Municipality.

“Climate Change and Environment Forums that are facilitated by the Chris Hani District Municipality. The forum involves transfer of knowledge and invite relevant stakeholders to advise on alternative energy within the Region to reduce climate change impacts.”

Access to sponsorship for further study (bursaries for degrees and courses) and well as access to training and research were reported by two participants (P1 and P6). Participant 1, a commenting authority for a quasi-government department responsible for economic development, mentioned that access to sponsorship for courses were available to anyone who wanted them within the organization. Participant 6, a commenting authority from the provincial department (Western Cape) indicate that there are annual bursaries opportunities as well as a dedicated training institute available for interested employees.

“We have annual bursaries which are open to staff who wish to further their qualifications in any environmental or related field (this might include qualifications related to renewable energy, e.g., doing your research master’s or PhD on renewable energy projects)”

In contrast to the above, the remaining regulators did not indicate any evidence of investment by their department in formal capacity building and training. Instead, information was acquired from stored information and informal means (P7, P8 and P9), as discussed in more detailed below.

- Stored information

The utilization of stored information was a strong occurrence amongst answers received from the regulators at a provincial level. Seven participants (P1, P2, P4, P6, P7, P8, P9 and P10) cited the use of documents (gazetted legislations, regulations, guidelines, management plans, zoning laws and EA documents) as a means of obtaining information. An interesting finding was that of the strong dependence of P7, P8, P9 and P10 on documentation received as part of the EIA process. In particular the use of specialist reports (included in the EIA reports), as well as outcomes as part of the scoping phase of the EIA yielded important information for regulators who did not have access to any formal training resources.

Two participants cited the availability of media resources as a means of information sources (P6 and P8), which is distributed in the organisation. P6 cites the availability of a publication whilst P8 cites the availability of internal newsletter.

“Our internal Media / Communications Unit has an internal publication which contains articles on certain environmental matters of interests in the Western Cape that is distributed to all staff to read (this might include news articles on Renewable Energy Projects in the Western Cape Province if it is of concern)”

Geographical spatial tools were developed as an outcome of the renewable energy SEA by the national department (DFFE), and it was also included as responses to the information sources available. However, the value assigned to these tools varied amongst participants. GIS capabilities in the Western Cape (as reported by P6), included access to a GIS unit which assists in spatial representation of renewable energy projects in the province, however the participant did not detail the value of this tool for their personal learning. Instead, it was listed as an available resource. A similar response was obtained by Participant 8 who mentioned the availability of GIS sources but went on to indicate it was not considered an important resource.

“We have GIS capacity. I can't think of something of an important resource.”

Participant 7 indicated that the use of the Screening Tool proved valuable for forcible consideration of heritage resources by other role players, which would have otherwise not been considered. However, it must be noted that the information acquisition for P7 from the Screening Tool was limited as input to the tool was obtained from within the organisations department (SAHRA). Value attributed to the Screening Tool by P2, include the ability of regulators to gain understanding of local sensitivities of new developments.

“The available resources include the EIA screening tool; the tool helps to identify what exists on site where new development will take place and surrounding features such as solar energy panels. This knowledge helps EIA regulators to advise the EAP on other sources of energy to be used that can be compatible to what already exist on the surrounding area.”

Participant 9 indicated that the Screening Tool was not necessary for their current job role, as such this resource was not considered an information source.

4.3.2.1.2 Informal sources of information

The interview responses from the provincial regulators suggest that informal means played a large role in acquiring information, especially in the absence of other resources. Two main themes highlighted in the data, included collaborative dialogue (internal and external) and self-learning through internal processes.

Collaborative dialogue was identified to occur either internally or externally of the organisation. Internal mechanisms for acquisition included dialogues with colleagues (P1, P2, P4, P6, P8 and P10), which largely included discussions during team and feedback meetings (P1, P2, P4, P6, P7, P8 and P10), and through problem solving discussions of current projects and solutions found (P4, P6 and P8). External collaborative dialogues also included engagement with EAPs, applicants and other authorities as a means of information retrieval which was often coupled with review of EIA documents (stored information). Due to the organisation structure, P9 could not discuss information within the organisation due to the unique role played. In order to supplement this, P9 undertakes external collaborative dialogues with provincial regulators (referred to by P9 as colleagues) where information and new perspectives are gained.

“Well, it could just be...Well it's a few things, one, in a report that you haven't read, your colleague picked it up, he was in the loop, you weren't but now you in the loop thanks to him or her.”

Internal processes which evidently contributed to information acquisition was mainly found to be through learning from experiences and self-learning undertaken by the regulator's own impetus. An example of this was from Participant 10 who wrote:

“Yes, I understand the various technologies better. This was as I did research while reviewing the EIRs for the various projects at some stage. Due to the increased impacts of these developments, I became more involved and better grasp the "off-set" concept as per the NEMA.”

Information acquisition through learning from experience was strongly reported by all provincial authorities. This experience was either own experience or by vicarious learning from another's experience. Information sourced from regulators own experiences included learning from renewable energy project implementation (P1), project appeals or negative decisions (P1, P4), current project stages (through public engagement, site visits, commenting stages) (P2, P4, P7, P8 and P9), learning from controversial projects (P4, P6, P7, P9), frequency of participation in renewable energy projects (P7) and accessing current news from newspapers and media (P4). Practical learning such as learning from site visits, and on-the ground exposure was denoted as

critical for knowledge generation by P1 and P4. Whilst the value of institutional learning was highlighted by P4 and P7 as important information sources.

The personal impetus for gaining information was illustrated by numerous participants, however Participant 10 paints the picture for the importance of self-research in the absence of resources;

“There is no skills platform within the organization that I'm involved in; the national DFFE does however provide refresher courses on the NEMA: EIA Regulations, but other than this the only option is to capacitate oneself either through self-study or contacting colleagues or peers within the field.”

Participant 6 response also shed light on the value assigned to regulator's own impetus for learning, whereby further research is cited for the regulators own understanding.

“Mostly via informal means such as through staff meetings in which cases are discussed, through having informal discussions with other colleagues regarding complex cases and how matters were resolved, through calling up files on cases and going through the information for you're the official's own understanding, attending presentations by other officials were certain cases are discussed.”

As mentioned earlier in this chapter the research findings indicated a link between information sources and sharing, and that the mechanisms for information sharing also play a dual role in information acquisition. Mechanisms for sharing information was reported through formal and informal means as well as through stored memory. Formal methods of sharing included meetings, conferences and/ or forums, training presentations (by technical specialists), internal communications and audit report findings (as part of the EIA process). Stored memory included electronic databases, meetings and minutes review, e-mail feedback within the departments. Informal mechanisms reported by provincial authorities included collaborative verbal discussions (internal and external) as well as discussions as conferences, informal communication means included WhatsApp messages to alert colleagues of potentially controversial projects. Informal mechanisms were frequently associated with personal relationships of trust and respect amongst colleagues. However, Participant 8 and 10, which are authorities within the same organisation but different departments. Both noted that sharing between colleagues are important to obtain information, however there is limited knowledge sharing within their organisation, as is evident from the following quote;

“Not much knowledge sharing is happening within the organization on a formal platform; colleagues learn on a one on one basis or through inquiries from colleagues that has knowledge on a particular topic.”

Therefore, in order to curtail this P8 ensures increased communication of decisions taken (with reasoning) within the department so that everyone is on the same page. No mitigation measures, other than the impetus for self-research was reported by P10.

4.3.2.1.3 Information acquisition, sharing and organisational memory for regulators at the national level

(a) Building capacity and training

Six participants belonged to the national environmental department (DFFE) (P3, P5, P11, P12, P13 and P14) occupying the role of competent authority, reported multiple internal structures available for organizational learning. Investment in formal training and capacity building drew a strong contrast to the responses received from the provincial regulators (bursaries and courses). The sentiment received from the regulators showed that access was not restricted to specific training types and extended to support for personal development and improvement. In particular, Participant 11 shared experience of personal improvement by accessing training such as driving courses and communication skills. All respondents expressed the view that these resources are available to employees who are interested and willing.

Information sources also included the access to technical training from industry specialists and NGOs (commonly cited organisations included BirdLife, South African National Parks (SANPARKS), South African Photovoltaic Industry Association (SAPVIA) and South African Wind Energy Association (SAWEA)). As the competent authority for renewable energy projects since the introduction of the renewable energy projects, the DFFE regulator also had access to feedback from external role players within the renewable energy sector. Access to workshops and conferences were also available for the regulators. In terms of formal processes, meetings (internal and external) were reported by five participants (P5, P11, P12, P13 and P14). In particular, the weekly meetings were seen as a valuable resource for sharing current information about projects.

○ Stored information

Stored information reported by national regulators were the same as those reported by provincial regulators (electronic databases, GIS tools, prescriptive means, and information from EIA process). The value of the Screening Tool as perceived by the national regulator differed from the provincial responses in that everyone cited the tool as a means of information, but the value lay with the EAP for application, and the regulators used the report to track if the specified specialist studies included. The capacity constraints within the department hinder the verification of outcomes of the Screening Tool as reported by P13. The respondents cited the means of stored information to include Standard Operating Procedures (SOPs), however no electronic databases were available within the department.

4.3.2.1.4 Informal sources of information

Informal methods of information included collaborative engagement with stakeholders. In particular the collaboration between regulators and the EAPs was cited as a valuable means of engagement, to obtain information. Five participants (P5, P11, P12, P13 and P14) communicated that a lot of trust and reliance is placed on the EAPs to ensure adequate, unbiased EIA report quality for the regulators to make unbiased decisions. Participant 3 played an instrumental role in the initiation and undertaking of the SEA for renewable energy projects, as such, source of information included access to informal training for ESKOM, CSIR (research centre) and NGOs throughout the SEA process. Learning through collaborative engagements (debate, discussions, and informal dialogue) about contentious projects drew information sources for regulators.

Self-learning through internal processes were identified mainly through experience. This experience was reported through EIA procedural processes, where increased frequency in participation in renewable energy EIA was cited as a means of improving knowledge acquisition (P11). Experience gained through participation in EIA stages (pre-application meetings, stakeholder engagement, site visits and document review) acted as a spark for regulator learning, specifically technical information gained during these stages were popular outcomes. Numerous participants within the DFFE (P3, P5 and P13) said that the structure of the organisation does not allow for feedback loops from compliance feedbacks, however only one participant (P14) recollected information sources from audit feedback.

Personal experienced gained through the SEA process, was described by P3 as a steep learning curve, which enable personal reflection and learnings. In contrast with provincial regulator responses, two national regulators (P12 and P13) shared experienced from senior mentorship as a way of obtaining information to correct actions. This review is facilitated by the bureaucratic structure within the DFFE.

Methods for information sharing and organisational memory included the same resources shared by the provincial regulators, however the flow of information sharing was different. The bureaucratic structure of the department facilitates the transfer of information both upward and downward (through internal meetings), whilst the lateral information flow is gained through by ensuring overlap of regulators in specifics stages of the EIA process. For example, numerous regulators attend the same pre-application meetings (P5, P12 and P13) so that information is not lost. Institutional memory from experienced colleagues was not cited as a key source of information, this may be due to the fact that institutional memory is embedded laterally within the department and not locked within only older staff.

4.3.3 Learning outcomes

Semi-structured interview questions B1, D1 – D3 was designed to draw out evidence of lessons learnt through regulator participation in renewable energy projects. The responses included in this section were grouped according to the key learning types identified in the literature.

4.3.3.1 Instrumental learning

In the context of this research, instrumental learning outcomes were primarily identified by reported increase in technical knowledge of renewable energy projects. This technical knowledge included; an improved understanding of the nature (technology, operation, and economic viability) and spatial extent of renewable projects; improved understanding of impacts (including cumulative) and mitigation measures; monitoring requirements and an improved understanding of the advantages of renewable energy implementation.

Regulators from the provincial department (P1, P2, P6, P7, P8, P9 and P10) expressed technical learning outcomes from renewable energy participation, citing the novel introduction of renewable energy projects as a reason for further investigation. Participant 12 described the value of technical knowledge available from renewable energy projects, as below.

“So, the EIA process presents me the information. The technical details and impacts, into the guidelines, insights into all the things that I didn’t know before I came into contact with these types of projects.”

Participant 6 also noted that they gained knowledge regarding the strategic importance of renewable energy in SA, and this translated to technical knowledge and a better understanding of the site selection considerations for renewable projects.

“As such, the knowledge that I have gained relates to how strategic matters such as the promotion of clean green energy must also be considered in the context of being site specific and using site specific data to make an informed decision. My knowledge therefore more so relates to knowing how certain sites are less desirable or more maybe more desirable/suitable for certain types of renewable energy projects.”

Four of the regulators from the national department indicated the same technical learning improvements through the participation in EIA. This improved technical knowledge was primarily gained from the review of the final EIA document (which correlated with results presented in Section 4.3.1.1.3) and through collaborative engagement with EIA role players during the EIA process (most frequently reported through pre-application meetings and site visits). Evidence of these learning outcomes were identified through similar responses such as P5 below:

“Like for example, you know for the wind farm specifically, you have to do 12 month bird and bat monitoring, right? And that’s not something that you find on a traditional EIA application that’s does not wind farm related - so there was that learning. Then you learn about the impacts

of the development. We also end up learning about the wake effects where one wind farm can actually affect the economic viability of another wind farm. So yeah, I have developed new skills and knowledge by participating in the EIA project. I mean, I told you, about monitoring the wake effects. And just in general, I mean even in terms of technical feasibility, because then it means to understand why certain applications come the way they are because you also need to understand the technicalities of a development type, then understand why it's being proposed in that aspect."

The use of the improved technical knowledge (scientific knowledge and skills) to improve future performance and prevention of future errors was more commonly reported by regulators in the national department (DFFE). This is captured by the response from P13 as follows:

"Because we as reviewers, we can't review something that we don't fully understand. And as a department we make a huge effort on having workshops with SANParks, SANBI, you know, general I&APs. To make sure that we're transferring knowledge. And to make sure that we're all on the same page. And that when we do review, we know what's going on. Because it doesn't help to review or comment not really knowing what the ins and outs of a project like that would be."

Regulators P5, P11, P12, P13 and P14 participated in a specialist training presentation regarding the wake effect caused by wind farms. All five of these regulators shared this example of technical learning through renewable project experience to improve decision making. All participants reported that the technical learnings were used for improved decision making on other wind applications. In particular, regulators shared that this new knowledge allowed them to be aware of what specialist studies to look for in wind energy projects and enabled them to advise on next projects and applicants about the new technical learnings.

A specific controversial project, regarding the granting of an EA for an offshore gas to power plant made headlines in the South African news, primarily due to the misuse of regulation Section 31A of the NEMA for emergency responses. Knowledge gained from the outcomes of such controversial projects also provide technical information for both provincial and national regulators. However, this information was often acquired through collaborative discussions, either formal (meetings, working groups) or informal (personal dialogue and discussions external from the organisations). These outcomes were notable at the forefront of the national regulator's mind when responding (P4, P9, P3, P11, P12, P13 and P14). Primarily single loop activities cited by P12 was mentioned as application of learnings to the next project of a similar nature;

"So that's where we get to learn from the colleagues that are actually dealing with that application so that in the future you know how to tackle that. The typical projects that will arrive. Yes, so it's information sharing."

Participants from the national departments (P5, P11, P12, P13 and P14) reported that learning from the outcomes of controversial projects, also helped regulators identify a mismatch in their understanding in interpretation of legislation and legal precedent. Participant P5 recognised that

unlearning was needed first before the correct information was interpreted, shared, and absorbed within the organization, which reflected double loop learning.

“And then when we end up learning that new interpretation and the... Well, the correct way of doing things, you then obviously have to change the mindset in way in how you look at things. Then you obviously then share that information to the rest of the team to ensure that we then do it consistently.”

Two regulators (P4 and P9) in the provincial department mentioned controversial projects as a means for identifying how things were handled, but no responses were given to indicate the future application of these outcomes.

Learning outcomes gained from experience and negative decisions developed higher learning loops for some regulators (double loop learning), where the outcome would be a pre-emptive correction of a system or process. This was identified by Participant 1 who cited that learning from negative decisions and appeals allowed for re-design of projects during the EIA process. Consistency in decision making was picked up as a frequent theme for all of the national regulators involved in renewable energy projects. Responses received, illustrate the common desire for ensuring consistency in terms of decisions granted and adapting from negative experiences and outcomes to create legally defensible authorisations (P11).

4.3.3.2 Experiential learning

The process of learning through experience was strongly present amongst respondents at both provincial and national level. This was primarily achieved through the regulator's own experience and that of second hand experience (vicarious learning). A number of regulators in the national department also indicated that practical experience gained through site visits enabled valuable learning outcomes (P1, P4, P5, P11, P12, P13). When questioned about resources available in the department to acquire new skills, participant P8 lamented that a lack of budgetary resources preventing attendance to site visits and thereby limiting learning from such practical experiences.

“Yeah, there is another big challenge because of the lack of resources is budget, to actually attend some of the site visits. I'm in the Namaqua district but my district there's big as the Gauteng province, and I'm based Springbok. Sometimes you have renewable energy spread all over the Namaqua district and sometimes I have to travel 800 kilometres to Sutherland to attend the site visits for a wind farm. And it's difficult in terms of budget wise.”

One regulator indicated that the frequency of working with renewable energy projects allowed for familiarisation of common technologies and enabled the national regulators to adapt the manner of decision making accordingly. Coupled with the perceived value of practical experience, all regulators reported the role of collaborative engagement with other EIA role players.

Of particular importance was the role played by the EAP to produce good quality EIA to inform decision making. Sharing of information in this case was through experiential learning from engagements with EAPs, applicant and specialists, specifically through pre-application meetings. This experience coupled with self-research played a large part in the regulator's perception of learning, with methods like searching and noticing influencing the final learning outcomes. In fact, specific stages of Kolb's Experiential Learning model could be identified from regulator responses, when asked to identify the new skills, knowledge gained from renewable energy project participation.

The acquisition of concrete evidence (CO) was obtained for most participants from national departments, through site visits and technical trainings regarding renewable energy projects. Examples of concrete experience gained by provincial regulators was mainly through EIA document review (of technical information which was premised to be of scientific validity), with the exception of P1 and P4. These participants believed that practical (on the ground) experience through participation in all stages of an EIA cycle enabled future adapted thinking and grounded acquired information.

The stage of reflective observation (RO), in which learners reflect, observe, and gain experience from different perspectives was demonstrated by regulators P3, P5, P11, P12, P13 and P14 appointed to the national department. However, this reflection was noticeably constrained according to specific work functions occupied by the individual. This can be better explained by drawing parallel across the individuals. Participants P5, P11 and P12 hold intermediate to senior positions in the department and have more than 7 years' experience each as regulators. Reflective processes reported by these participants included the strong emphasis on technical information acquisition (increased scientific learning and improved interpretation of legislation) which thereafter led to these regulators engaging in collaborative discussion and sharing within the department and role players in the EIA process. Experience from different perspectives could only be gained during procedural processes and collaboration (pre-application meetings, site visits, appeals, and public comments review). This experience was likened to single looped learning at an individual level where errors in decision making was corrected (better understanding of legislation and writing legally defensible conditions).

Personal experience for participant P3 and P14 differed from other national regulators due to the role occupied in the department. Participation in the SEA process enabled P3 to engage with multiple role players through an iterative research based platform, where a chance for reflection was possible. This reflection could be then applied for testing developed theories. Participant 14 was able to reflect on outcomes from compliance and audit feedback, which facilitated critical reflection and resulted in a change toward amending approaches to decision making. In contrast,

to the response received by participant P14, three participants (P3, P5 and P13) from the national department stated that feedback from compliance audits was not possible.

4.3.3.3 Transformative learning

Content of the literature review detailed that the transformative learning process can be identified to occur through different learning processes. For the ease of reference in this research, the results are set out according to evidence of social learning, double loop learning and triple loop learning.

4.3.3.3.1 Social learning

The South African EIA process mandates opportunity for public participation and engagements, facilitated through the public review stages for I&APs. However, the degree of participation varies for both commenting and competent regulators (as previously illustrated in Figure 1-2). Regulators who comment on EIA projects, are typically consulted at the pre-application stage, and are invited to review EIA documentation and attend public meetings if required. Role players accessible to regulators issuing decisions (competent authorities) typically comprise of the EAPs and applicant within a particular renewable energy project (with other engagements mainly occurring outside of a specific application). Common to both commenting and competent authorities, however, is the potential for collaborative engagements. Collaborative learning was a consistent theme identified from interview responses, especially as a mechanism for information sharing and acquisition. The internal structures present for collaborative engagements allowed for the identification of different learning levels for individuals.

Regulators at the national department have indicated that the public participation process poses the most important source of learning so that communities and local I&APs are heard and understood. This understanding occurs through a process level task of document review for regulators and rarely includes the engagement with I&APs during a process, where there is a necessity for objectivity (as explained by P5 and P14).

Single looped outcomes were reported (P1, P2, P4, P5, P6, P7, P8, P9, P10, P11, P12, P13 and P14) whereby this “collaborative engagement” (vicarious and through process) enabled improved technical knowledge which resulted in process changes to the way an authorisation was written, interpreted or a project assessed. Participant P11, even streamlined work method through initiating collaborative engagements with other sections within the national department. In order to save time, P11 started organising group meetings with other sections who would be required to comment on a project.

“Okay so especially for renewable energy projects, the application is lodged right? So other units in our department are competent authorities if I can say that. For example, the air quality

section is going to have to comment on the project, and the waste section and biodiversity ad conservation. So, because of that we have established, what, a working program of how we will work. Especially when it comes to renewable energy applications. So, I can even say, we sit around the table and discuss a particular project to save time. Especially when it comes to renewable energy applications.... So, they are divided right, there is a section which I am belonging to which is reviewing EIA applications, then there's another section which deals with waste, there's another section for climate change, there's another section for air quality, there's another section for biodiversity and conservation. So, all of those sections are supposed to comment on this report that I'm reviewing. So, to shorten time, it's better to just sit around the table fast and discuss this particular project. Then they give me their content or comments then we address it there."

In addition to this example, the response received from national regulators seemed to echo one another, in that the same learnings and adaptations were reported across answers received from P5, P11, P12, P13 and P14. This involved outcomes which focussed on ensuring consistent decision making, and defensible conditions. From these answers, it was evident that information sharing was effective in the department to create uniform messaging. The collaborative sharing of information can be considered a mechanism for consistent information sharing up and down the departmental structure. Although more senior regulators showed a richer outcome of collaboration than the junior counterparts. The parallel could be attributed to the opportunities available for these senior officials such as working group forums, conferences, and participation in strategic assessment processes like SEA. At a provincial level, collaborative engagements were consistently interwoven in all answers received from P4, where information sharing, and acquisition played crucial roles in shaping the regulator experience in renewable energy projects. Engagement with applicants and colleagues (institutional memory from experienced individuals) was highly valued by P4, but this was coupled with self-research based on the regulator's own beliefs and personal history.

4.3.3.3.2 Double loop learning

The occurrence of double looped learning for provincial regulators could not be adequately determined, due to the small sample size of participants from a specific department. Six out of eight provincial regulators were from different departments (P1, P2, P9, P4, P6, P7). A change in the organisations norms, values or strategies could therefore only be interpreted at an individual perspective. When asked to describe any changes in values, thinking and behaviours as a result of renewable energy projects; P2, P6, P7 and P8 reported instrumental learning outcomes, whilst P10 reported no changes as a result of renewable energy projects. Participants P1, P4 and P9 however reported higher learnings being observed. A notable change in EIA decisions (and authorisations) was reported by P1. This change was observed (and reported by P1) as well thought out conditions, more frequent rejection of application and critical thinking exhibited by

regulators from the national department. However, this change was not specific to renewable energy projects.

4.3.3.3.3 Triple loop learning

This investigation was reliant on the individual responses of regulators when questioned about their participation in renewable energy EIAs. In essence, these responses relied on personal experience of individual participation producing data which focussed on perception. This research was therefore limited in evidencing the occurrence of triple loop learning outcomes due to limitations in the research design (see Section 3.5). Sanchez and Mitchell (2017) described triple loop learning as a strategic change in the focus of an organisation, however the nature of public administration differs from private organisations. Changes in strategic focus is often reliant on external impetus which are influenced by political factors and national priorities. Despite this limitation, the data was able to provide insight on personal perception of change within the organisation, which according to Sanchez & Mitchell (2017:197) provides “*evidence of systems thinking, joint learning and open communication as learning outcomes*”.

The evidence of triple loop learning was captured in responses received from two participants (P3 and P4). Due to the role held in the provincial (P4) and national department (P3) these individuals were able to participate in an iterative manner through both the EIA process as well as through their departmental duties outside of a singular renewable energy application.

Participant 4, a director at the provincial level is involved in competent, commenting and training roles at the department. Evidence of triple loop outcomes as part of a transformative learning process was primarily displayed by responses indicative of systems thinking. The individual reported self-research and continuous collaborative engagement to build on existing personal knowledge. This knowledge was then shared through self-built feedback loops to internal and external parties, thus resulting in a transfer of information primarily through personal drive. Acquired knowledge from renewable energy projects was then reportedly adapted to other renewable energy projects:

“So going to the first wind farm you understand what needs to happen because the consultant who did the work said, this is what's going to happen and so forth.”

The participants provided answers which illustrated critical thinking based on experience and a desire to see pragmatic solutions to current EIA constraints.

“I think the EIA regulations need to go under some severe or serious reworking. And I say I think we spend too much time on some items that actually don't require an environmental authorization, why I'm saying this. I can only share real life example” and “Sometimes I think the

regulations need to be applied in a more pragmatic way. Cos the guys that drafted the legislation I think are all lawyers and they are not practical people who work with things on the ground”.

This illustrated that P4 was able to wholistically question current efficiencies in search of new solutions, however it must be noted that this was merely identification of current constraints in the EIA process. The correction thereof was outside the scope of the role afforded to P4 in the current capacity. Nevertheless, this critical identification traces triple loop learning.

An interesting point to note regarding P4’s learning outcome is that the system thinking approach was a culmination of EIA experience over the years and not specifically due to renewable energy project participation. This is demonstrated by an example of correction of the provincial department decision making actions.

“So our response to that, is now, that you secure the services of a suitably qualified and experienced Environmental Control Officer, and you need to submit the appointment letter and the CV of said environmental control officer. So we kind of adapt or conditions accordingly when we see that there is a gap that has been created by previous conditions, or people have found a loophole to work around our conditions”.

Another interesting result identified from P4 responses is the personal inclination toward knowledge sharing and preservation of institutional memory. P4 lamented on the non-willingness of junior colleagues to learn from experienced colleagues and to adapt outside of their specific job function. An indication of the influence of personal experience was also highlighted as a driving factor in P4’s desire to capacitate within the department and to provide help to I&APs outside of the department:

“And I said to him what I said to you now is that I experienced government when I was outside government and it’s a terrible, terrible experience. If you’re outside government, you are treated like dirt. That is something I told myself I will never do to a client. If I cannot help them, I will tell them I can’t help you. If I can help them, I will go out of my way to assist you.”.

Through this voluntary networking, information distribution is shared outside the organisation to the general public. The influence of personal experience and value systems played a part in shaping P4’s approach to learning and undertaking the job. P4 had worked with mentors with a demonstrable commitment to environmental protection and technical knowledge, the participant noted that this mentorship and participation in voluntary committees played a part in his learnings today and environmental ethics. P4 also viewed the government sector as a place in which most changes could be effected.

Participant 3 (P3), a former Chief Director for Impact Assessments at the national department played an integral role in implementing a SEA process for renewable energy projects in South Africa. According to research published by Fischer *et al.* (2020) the aim of the SEA undertaken

by the national department was to improve national renewable energy planning and improve regulator decision making.

Participant 3 recalled that there was a significant impact on regulators at the national department (then known as the Department of Environmental Affairs) due to the introduction of the REI4P in 2011. Regulators responsible for decision making and granting authorisations were inundated and overwhelmed with new and amendment applications for renewable energy projects, due to the speculative nature of the process and changing requirements instituted by the IPP offices. The quote below, illustrates how identification of a problem, through experience, resulted in a need to investigate better ways to undertake administrative tasks for the regulators.

“So, it was this frustration of seeing all of these applications and just seeing the fatigue of the staff and knowing that this was just... They give you absolute rubbish because they are so far from actually developing the project that everything is speculative. And you know that. You know that when you are reading in the document, so you kind of thinking to yourself: “Why am I doing this, it’s such a waste of time.” So that experience, it made a huge number of changes, so we were making amendments to the EIA, in 2014, we were making amendments to the EIA regulations, and if you see what the regulations were prior to 2014 and what they were after 2014, if you did a check on what actually happened, you’ll see that a lot of the administrative steps prior to 2014 were removed. So, acceptance of documents. And all this came about because of looking at so many EIAs and seeing the problems. So, you’ll see there.... well that the changes that were made were a direct result of the number of applications that we were receiving.”

Participant 3 also made the distinction that a singular EIA process did not instigate a change within the national department, but rather the impact of external policy and redirection of national priorities, caused a burden on the EIA administration. Learning for P3 therefore was not gained through participation in EIA, but rather from observing the constraints put on the departments and the notable knock on effects on administrative inefficiency. Evidence of reflection from personal experience is evident from the following statements made by P3;

“So, on the basis of that, I would say from my own personal learning, it was immense. So, it wasn’t actually an EIA that changed my thinking. It was reviewing the process of all these EIAs that were so speculative and so time-wasting, it really was time-wasting, and you had to ask yourself: ‘Isn’t there a better way of doing this?’ “ and “So, it’s not learning from looking at the EA, but it is learning from the number of authorisations that come, just the inefficiency in the system.”

The experiential learning stages observed by P3 is tabulated in Table 4-3 and demonstrate both single and double loop processes.

Table 4-3: Experiential learning process reported by P3

Experiential Learning Stages	Participant Evidence
Concrete Experience (CO): Unbiases, open and full involvement.	Inundation of renewable energy applications; observable administrative inefficiencies and time wastage. Obtained through observation and review of numerous applications.
Reflective Observation (RO): Ability to reflect and observe gain experience from different perspectives.	Asking critical questions to find a solution. “Is there a better way of doing this?”
Formation of Abstract Concepts and Generalizations (AC): Ability to create and integrate concepts into logically sound theories.	Investigation into a better way of doing things resulting in the undertaking of the renewable energy SEA. Consideration of national priority and strategic national focus, integration of scientific data to understand spatial extent of increased renewable energy applications.
Testing Implications of Concepts in New Situations (AE): Ability to use formed theories to make decisions and solve problems.	Output of SEA to for decision making (Screening tools, Renewable Energy Development Zones (REDZ), change in legislations and introduction of sector guidelines.

Triple loop outcomes were also demonstrated by P3’s recollection of the learnings gained through participation in SEA, where a change in personal perceptions and integrated systems thinking was realised through the collaboration and contributions made by stakeholders in the SEA process.

“We’ve seen so many EMFs so many other SEAs that have become documents that took a whole lot of time to generate and a whole lot of money and they really never contributed anything. I think our SEAs contributed immensely. They contributed all the data, you know, the sensitivity data that you see on the screening tool, that’s all come through the SEA approach. And the approach of SEA where you go in, I mean I prepared the terms of reference. I had a certain thing in mind, but over the time with the consultants that we had, we had the CSIR doing many of the ones and the kind of learning that they brought, you know, it was such an iterative process where they brought so much. I mean I had an idea of the source information, but I mean they made it real. They actually were able to take the idea and to make it something that, that I wouldn’t have considered before. It was such a learning curve. And then we had stakeholders. There were a couple of people from Eskom and there were a couple of people from the Energy Association, and they were just incredible. They brought a whole new concept and a whole new way of thinking into the process for me.”

The outcome of the SEA process was used to amplify and grow intuitional learnings, however, the dimensions reported by P3 were interwoven with their personal belief and internalisation of

the role of the regulator in effecting change and transformation. P3 stated that the role of the regulator was important due to the ability to identify problems and make changes when problems are identified. This was similar to the value attributed by P4 to being in government as a decision maker. Problem solving including instrumental changes to legislation, building facilitating tools to enable better decision making and inherently build institutional learning capacity. This is based on the quotation below.

“So, if you ask you ask how my learning of the process or what was the inefficiency of the process, how did that kind of, impact institutionally, I think as a decision-maker and being in government, it gives you a level of...It gives you more ability to make changes than anywhere in any other section, anywhere else other than maybe being a mother or a father. Because you have the ability to see the inefficiency and I’m talking about my own case now, the case we just looked at, the inefficiency in the system for renewable energy. So, you’ve got the ability to look at those inefficiencies, you’ve got the ability to make amendments to law which we did do in terms of the 2014 legislation. We went on to do those SEAs which were specifically aimed towards making the process more efficient which we did do. We reviewed timeframes, we identified the zones, we changed the scoping and EIR process to a Basic Assessment in those days. We looked at review timeframes and we hope to exclude solar in certain low environmental areas. So, from the law we then created projects that specifically looked at solutions to the problem and then in terms of the screening tools, all of that is learning that comes from looking at an inefficient system and it builds on to the screening tool where we put the sensitivity information from the SEAs where we actually provided the protocols that go with specialist assessments. So, you can identify protocols that go with certain specialists so you can identify protocols, so the screening tool identifies the list of specialists that you need to do. All of that is institutional learning. And it’s deep institutional learning because it’s embedded in law.”

P3 also acknowledged the role of retaining institutional memory and the necessity of embedding information in systems and not just people, where these outcomes changed national policy and actions of regulators.

“So that all takes a long time. I mean, it doesn’t happen overnight, so it is important that you retain people. And I’m not just saying that one person, but you know, you retain that institutional memory, and you move forward on that institutional memory, so it doesn’t just sit in a document; it becomes deeply rooted into the organisation. And, I don’t know, just from the experience that we talked about now, how the efficiency in EIA from the renewables point of view, it made huge changes in the way that we operate. Huge. I mean, it changed laws, it changed systems, built new systems.”

The triple learning outcome of the SEA process was evident for P3 in this regard; however, one cannot discount the evidence in support of a transformation in renewable energy project administration, perceptions, and application of these tools. In Sections 4.3.2 regulators cited the advantages of these knowledge repositories for their learning in renewable energy projects, whilst improved collaboration reported by regulators also demonstrated the improvement of communications due to renewable energy project implementation and subsequent process correction from knowledge gained through these engagements.

The change in the strategic focus of the national department can be best described by P14, who explained that regulators demonstrated a shift in dealing with renewable applications because these projects are a national strategic priority. As such, certain leniencies (within legal standing) were afforded to applicants of renewable energy projects. P14 stated the following;

“Yes, there is, there is a serious change. I mean, we looked at renewable energy projects or developments with a view that they are here to stay and they are here to provide a better life for many people, and it is clean technology so, and one might be tempted to say there will generally be sympathy towards applications of that nature, compared to when you come and apply for a nuclear energy or a coal-fired power station, you understand me?..... So, it has given me, it has given us that paradigm shift to say, but this is a clean technology, we need to listen to the applicant and when it comes with that proposal, better”.

4.3.4 Chapter conclusion

This research aimed to investigate the influence of regulator participation in EIA on organisational learning for renewable energy projects. Methods employed to achieve this aim and fulfil the research objectives included a thorough review of the academic literature, which uncovered tools to evidence organisational learning in practice. Published work by Cruz *et al.* (2018:246) proved useful to link theory and practice in that the authors provide a set of guiding elements which indicate the occurrence of EIA learning. This section utilises the contribution of Cruz *et al.* (2018:246) as a benchmark to capture the occurrence or absence of guiding elements as reported by participants of this research, where Table 4-4 collates the findings of this research. It follows that the occurrence of these elements can provide a strong indication of organisational learning as reported by regulators.

Table 4-4: Guiding elements for finding evidence of EIA learning from interview responses (table structure adapted from Cruz et al, 2018:246)

Questions	Category	Evidence
What can be learnt?	Single loop learning	• Increased scientific knowledge; • Increased understanding of renewable energy projects impacts and mitigation; and • Correcting and unlearning routine actions during decision making, towards enhanced decision making.
	Double loop learning	• Change in authorisation conditions; • Change in perception and thinking (sympathy toward renewable energy projects); • Recognition of gaps in the legislation and improved critical thinking.
	Triple loop learning	• Internalisation and reflection of experience; • Strategic change in focus of department;

Questions	Category	Evidence
		• Evidence of systems thinking within concepts of sustainability and external national political driving forces; • Innovative thinking through the application of other EA tool (SEA) to correct and improve experience working constraints regarding renewable energy administration.
When were the lessons learnt?	EIA stages	• Pre-application stage; • Site visits; • Public participation with collaborative engagements with specialists, EAPs and applicant; • Review and decision making stages when final reports are available.
How was it learnt?	Information acquisition	• Formal training and capacity building; • Informal collaborative engagements – group learning (experienced colleagues, other professional EIA role players, specialists, academic forum); • Formal engagements (forums, weekly internal meetings; workshops; working groups); • Self-research and critical questioning; practical experience such as site visits. • Stored memory (see below)
Embedding knowledge	Organisational memory	• Documents (gazetted legislations, regulations, guidelines, management plans, zoning laws, SOPs, and EA documents) • Geographical spatial tools; • Staff meetings; • Experienced staff; • Documented information (e-mails, meeting minutes, informal notes).

These collated results presented in Table 4-4 indicate similarities to investigations undertaken by Fitzpatrick (2006). Sanchez and Mitchell (2017) and Cruz *et al.* (2018).

Sanchez and Mitchell (2017:196) described the taxonomies of learning through the impact assessment process. In their study, Sanchez, and Mitchell (2017) approaches the taxonomies by question who learns, what is learnt and how learning is achieved. The majority of participants in the current believed that all participants in the EIA process can learn in line with the authors taxonomies. The authors stated that new skills, behaviours and changes in norms and values were possible as learning outcomes, however not all of these outcomes were unanimously observed in the present research because the primary outcome experienced was single loop knowledge (new knowledge and skills). The current research only demonstrated two examples of transformative learning and change in behaviours and values, which were not necessarily a result of the EIA process itself. These changes were rather attributed to lifelong learning and

opportunities for participations in governmental processes which are less accessible to all regulators involved in decision making.

Fitzpatrick (2006) contribute the internal structures required for organisational learning, which can be identified in responses received from participants in this research. Fitzpatrick's framework of information sharing, information interpretation and organisational memory could be mapped through the participant responses which helped to identify the mechanisms in which learning stages could occur. Methods for organisations to share information (Fitzpatrick, 2006:161 and 165) included meetings, direct communication (emails, telephone calls) and indirect communication (websites, articles, newsletters, conversations). The results of the current research indicated that all of these mechanisms were either used or present as part of the regulator decision making processes for information sharing. Information interpretation as described by Fitzpatrick (2006: 168) required a shared meaning of information which was acquired through various activities. These activities according to the author indicated that development of assessment material, post-hoc review of the EA and the organisational mandate and membership of individuals assisted in information interpretation. The results of the current research showed that the review of the EIA report derived the most value for participants. The role of the organisation mandate and membership of individuals at the national department indicated string similarity in values and work objectives. It was clear from the results that the mandate of the national department permeated the interpretation process for these regulators.

Fitzpatrick's (2006:170) study indicated that both non-human and human memory was necessary for organisational learning. The author cited human means as, "*human memory, mentorship programmes, multiple members of an issue, organisational culture and external individuals*" and non-human means to include records, journals, Environmental Management Systems, and business plans. The findings of the current research correlated to this published work by participants citing external human memory and sharing from external individuals as a means of retaining information in the organisation. The organisational memory retention process was more formalised at the national level due to mechanisms being put in place. These mechanisms included the use of Standard Operating Procedures, regular meetings, documentation of projects and multiple regulators working on an issue to ensure that information is shared throughout the department in case of employee loss.

From the above, it is evident that the elements required for organisational learning are present for both national and provincial departments at varying capacities. The next chapter brings together the results obtained in relation to the sub-questions and objectives of this research and contribute to achieving the main aim of the investigation, which is to understand the influence of regulator participation in EIA on organisational learning for renewable energy projects.

CHAPTER 5 CONCLUSION AND RECOMMENDATIONS

5.1 Chapter introduction

This research aimed to investigate the influence of regulator participation in EIA on organisational learning in renewable energy projects. A qualitative approach was taken to investigate regulator perceptions of learning and comprised of a total of fourteen participants. The participants included both commenting and component authorities, from the provincial and national departments. A literature review was undertaken to provide a baseline of published theory with regard to learning within EIA process and the fundamentals of organisational learning concepts. The outcome of the literature review contributed to formulate a conceptual framework for the research.

The conceptual framework was also used as a guideline to develop the semi-structured interviews questions which were posed to the participants. Interviews were conducted from September 2021 – October 2021 and analysed through coding and pawing of individual responses. These results provided insight into the regulators perception of the potential to learn through EIA and provided insight into the lessons learnt through participation in renewable energy projects. These results directly related to answering the research questions posed in this research. This section provides a summary of the results and links it with the specific research sub-questions. This is then linked to answering the main research question. The section concludes with recommendations for future research.

5.2 Summary of results

This section aims to bring together the findings of this research to answer the research questions set out in Section 1.5, which will provide a baseline for answering the main research question.

5.2.1 Summary of results which answer research sub-question 1 (What are the opportunities for learning within the South African EIA process?)

The opportunities for learning within the South African EIA process was identified theoretically from the literature review in Section 2. These results suggested that opportunities for all role players to learn through EIA participation is possible at different stages of the EIA process. Moreover, opportunities for regulator learning were reported through scoping, impact assessment, public participation, monitoring and follow up and accessing EIA knowledge repositories. An investigation of the baseline perception of regulators with regard to the ability of EIA to promote learning, conclusively showed that opportunities for learning was perceived to be definite through EIA participation. Mitchell and Sanchez (2017) described that by asking who can learn through the process, opportunities for learning can be identified. The participants reported

that I&APs, EAPs, specialists and applicants could learn from EIA process, where I&AP learning was repeatedly reported as the most significant potential benefit of the EIA process. Mechanisms for I&AP learning was perceived by participants to happen during the public participation process and can be characterised through to social and collaborative learning as described by Webler *et al.* (1995), Fitzpatrick (2006), Sinclair *et al.* (2008), Chavez & Bernal (2012) and Sanchez & Mitchell (2017).

The findings did uncover that many regulators believed that the public participation process in South African EIA systems do not adequately include all vulnerable groups, thereby limiting the potential for learning. This finding can be thought to be supported by the following statement made by Alberts (2020:72) regarding the South African EIA system, *“The consensus from the research seems to be that the South African EIA system provides extensive opportunity for public participation, but that the implementation thereof does not always reflect best practice.”* Despite this limitation, the general consensus was in favour of EIA to promote learning.

In order to delve into the regulator experience, the research probed participants to share when the most learning was believed to have been achieved by themselves, through the EIA process. The general consensus was that the decision making stage whereby the review of the final EIA documentation provided a beneficial way to obtain knowledge and learnings through the process. For some regulators, a lack of resources provided by provincial administration meant that learnings could only be obtained for renewable energy projects, from this administrative action of reviewing.

This is an interesting finding when compared to research conducted by van Staden (2019:97), who investigated the perceived benefits of EIA by EA government officials. The author reported that regulators believed that reviewing reports and environmental legislation could bridge the gap between EIA’s potential and perceived benefits.

Further to this, participants in van Staden’s study (2019:97) noted that, *“Specific training on reviews of specialist reports is recommended by participants to make informed decisions as opposed to relying solely on the specialist... It can be interpreted that reviewing is an integral aspect which must be implemented throughout the EA process.”* This confirms the present research’s findings whereby regulators valued reviewing as a source of information and learning.

The dependency of good quality EIA documents (including specialist studies) was inferred from responses; however, no mention was made by participants in the present research for requests for specific training to review these reports. Furthermore, participants in this research communicated those technical reports play a critical role in decision making.

A strong theme in the findings was that of collaborative engagements. Regulators reported opportunities from practical experience and participation in pre-application meetings and site visits as a valuable way to acquire information and knowledge. This was mainly due to the collaborative and collective engagement between EAP, applicants, specialists, NGOs, and consultants. Through her investigation of collective learning through climate knowledge systems in South Africa, Never (2012:235) described that cognitive evolution is achieved through collective learning as a social process, whereby scientific knowledge was embedded in communities of practice (Never, 2012: 253). Never (2012:235) indicated that *“informal, personal and flexible relations between experts, public and private actors can foster the governance of climate change without undermining the state.”* The collaborative and iterative nature of the EIA process was found to be a driving force of learning for several participants in this research. The findings also indicate evidence of scientific knowledge being accessed by regulators from these *“communities of practice”*, which in this context included specialists and special interest groups like BirdLife South Africa, SANPARKS and renewable energy sector groups (SAPVIA and SAWEA).

Despite the positive findings, this research also uncovered current constraints concerning learning through the EIA process for regulators. To enable organisational learning, specific internal structures (Fitzpatrick, 2006) and guiding elements are required (Cruz *et al.*, 2018) to be available for potential learners. The findings of this research drew light onto the fact there is a gap between the provision of resources (to acquire new learnings) between provincial and national departments. The lack of resources forced some participants to learn through other means outside the EIA process, while others just relied on EIA documents' information. It follows that these barriers to learning, especially in the context of new technology implementation (renewable energy), can hinder government capacity and skills and contribute to procedural inefficiency. This is supported by previous work undertaken by van Staden (2018:62), who found that *“there is a lack of competence in the South African EIA system”*. In particular, the author cites that departments are *“short-staffed and low on funds and resources related to staff capacity, technology and time.”* This report is congruent to the responses provided by regulators in this research. The constraints can now also be linked to constraining the potential of learning by regulators through the EIA process.

5.2.2 Summary of results that answer research sub-question 2 (What has been learnt by regulators through their participation in renewable energy EIA?)

The learning outcomes gained by participants in this research included instrumental learning for both provincial and national regulators) changes in perspectives and strategy (regulators from the national department), improved communication with role player in the renewable energy space and streamlined decisions through the implementation of SEA for national renewable energy

planning and policy. The main outcomes were classified as instrumental and single loop learning where improved scientific knowledge was gained. Technical outcomes included an improved understanding of the technology, operation, economic viability, and spatial extent of renewable projects; an improved capacity in assessing impacts and understanding mitigations for renewable energy projects and an improved understanding of the advantages of renewable energy implementation. Regulators notably obtained these single loop learnings to improve daily tasks and processes. This was because the improved knowledge facilitated understanding of renewable energy projects and, therefore, assisted in reviewing documents and administrative tasks. It is important to also highlight the role played by the SEA process in implementing specific tools to help regulators with decision making. Many regulators reportedly used tools such as the Screening Tool, REDZ guidelines, and policies to improve instrumental learning and their own understanding. The support for these tools shown by regulators at national government was evident, and some reported that the streamlining of administrative processes through the REDZ zones improved departmental efficacy and capacity. Double loop outcomes were harder to determine for provincial regulators due to there being a small sample size from each province. Changes in values, thinking, and behaviours resulting from renewable energy projects could be linked to instrumental learning outcomes for most provincial regulators.

Transformative learning process which showed triple loop learning processes evidenced through this research, could be related to two participants (one from national department and one from provincial). These triple loop outcomes were strongly linked to personal opportunities and experiences available to these participants. Participation in the SEA process, and the unique position to identify problems in the department afforded P3 a platform to reflect and act. The learning for P3 started with single loop identification of problems and then grew personal impetus to improve efficiency and rectify the identified problem. The participant reported a steep learning curve due to renewable energy projects which resulted in the undertaking of SEA. The lessons learnt were primarily gained through the SEA process, despite the identification of problems with EIA administration.

Triple loop outcome for the provincial regulator was identified by the individual passion to reflect on past experiences and get better. The transformative learning process was a result of a culmination of personal and professional experience and not specifically due to EIA process or renewable energy technologies.

5.2.3 What is the influence of participation in EIA on organizational learning from a regulator perspective for renewable energy projects?

The main research question can now be answered by considering the literature review results presented (Chapter 2) and the results obtained from analysing the participant responses to the interview questions (Section 4.3 and Section 5.2.1- 5.2.2). The finding suggests that there are facilitating mechanisms used by regulators to drive organisational learning, this is evidence by the general account of internal structures available at departments (see

Table 4-4). The evidence of information acquisition and sharing through both informal and formal means, and from internal and external sources allowed participants to gather knowledge about renewable energy projects.

Alberts (2020:85) indicated that, *“A government administrative actions may include rule making, adjudication, or the enforcement of a specific regulatory agenda.”* Through the formal EIA process and administrative duties, participants were able to gain improved scientific knowledge which assisted them in undertaking their tasks and hence influence decision making, where single loop learning outcomes were primarily identified from this evidence. This conveys the message that through participation in renewable energy projects, regulators were first able to improve their understanding of this new technology on theoretical basis. The application of this theory was applied to other projects, and it seemed that the general technical understanding got easier relative to the frequency and exposure afforded to regulators. Regulators (especially at national departments) were able to identify a particular problem better on a subsequent application. EIA participation reported improvements in writing conditions and understanding legislation better as a learning outcome. This was reported by participants who learnt from negative decisions regarding a renewable energy project (somewhere directly involved as regulators, whilst lessons learnt were passed down to other regulators). Despite this learning being borne out of a renewable energy example, one should be careful to attribute the learning solely to renewable energy projects. Instead, this learning should be attributed to outcomes of controversial projects and appeals processes due to EIA in general.

This research has also uncovered the reliance of regulators on collaborative interactions as a source to learn through the EIA process. This social learning was said to occur both internally and externally, which improved communications with professionals in the renewable energy sector. Improved communications were noted explicitly for NGO groups and sector organisations, where this improved communication was a direct result of renewable energy projects. Transformative learning processes indicate organisational learning, but this occurrence was limited to two participants in this research. The occurrence of which was influenced by specific set of

circumstances and individual experiences. Participation in the renewable energy SEA process (from beginning to end) was not afforded to all regulators and therefore learnings varied according to the individual experience and opportunity. This is significant to this research because it indicates that the change in strategic focus is constrained by the bureaucratic structure of the public department, and organisational learning is thereby restricted.

Therefore, the influence of regulator participation in renewable energy EIA on organisational learning was found to be limited. The increase in renewable energy projects has contributed primarily to single loop learning outcomes for commenting and competent authorities. In addition, the findings also suggest that facilitating mechanisms for organisational learning that are in place (information acquisition, sharing and organisational memory), was not exclusive to renewable energy projects. Instead, these existing structures were utilised to understand renewable energy projects better. Therefore, the ability to realise triple learning outcome for most regulators is reliant on external factors like changes in political imperatives through national governance.

5.3 Recommendations for future research and practise

The investigation of organisational learning with respect to EIA participation could be advanced by further research being undertaken in the following areas:

- Further investigation into the internal constraints experienced by provincial regulators. Such as the availability of knowledge repositories, formal and informal resources available to provincial departments, and how this affects learning capabilities for regulators.
- The perceived value of EIA report quality and content in contributing to learning for regulators from a consultant/ EAP perspective. This topic could be expanded to include considerations of regulator dependence on the EAP, and the information provided in their reports.
- The influence of I&AP participation from the South African EIA process, this research could investigate if there is fair inclusion in the public participation process and identify learning processes for I&APs.
- Investigate learning outcomes gained for regulators from monitoring and follow up processes.
- EIA practitioners may also be able to utilise insight provided by participants regarding the need for comprehensive inclusion of the public participation process (comments and concerns) as well as the specialist investigations when compiling project EIAs.
- Practitioners may also be made aware (if not already) of the possible communication links and networks within the renewable energy space, as a means for knowledge sharing and co-operative EIA processes.

BIBLIOGRAPHY

Akinbami, O.M., Oke, S.R. & Bodunrin, M.O. 2021. The state of renewable energy development in South Africa: An overview. *Alexandria Engineering Journal*, 60(6):5077-5093.

Aliyu, A.K., Modu, B. & Tan, C.W. 2018. A review of renewable energy development in Africa: A focus in South Africa, Egypt and Nigeria. *Renewable and Sustainable Energy Reviews*, 81:2502-2518.

Anand, G., Larson, E.C. & Mahoney, J.T. 2020. Thomas Kuhn on Paradigms. *Production and Operations Management*, 29(7):1650-1657.

André, P.L.E., Sanchez. *Organizational learning in EIA agencies-the case of Quebec, Canada*. Paper presented at the Impact Assessment and Responsible Development for Infrastructure, Business and Industry, 31st Annual Conference of the International Association for Impact Assessment, Puebla, Mexico 29 May - 4 June 2011.

Antwi, S.K. & Hamza, K. 2015. Qualitative and quantitative research paradigms in business research: A philosophical reflection. *European journal of business and management*, 7(3):217-225.

Argote, L. 2013. Organization learning: A theoretical framework. In. *Organizational learning*: Springer. pp. 31-56.

Argote, L. & Miron-Spektor, E. 2011. Organizational learning: From experience to knowledge. *Organization science*, 22(5):1123-1137.

Argote, L. & Fahrenkopf, E. 2016. Knowledge transfer in organizations: The roles of members, tasks, tools, and networks. *Organizational Behavior and Human Decision Processes*, 136:146-159.

Argote, L. & Hora, M. 2017. Organizational learning and management of technology. *Production and Operations Management*, 26(4):579-590.

Argote, L., Ingram, P., Levine, J.M. & Moreland, R.L. 2000. Knowledge transfer in organizations: Learning from the experience of others. *Organizational behavior and human decision processes*, 82(1):1-8.

Argyris, C. & Schön, D.A. 1997. Organizational learning: A theory of action perspective. *Revista Española de Investigaciones Sociológicas*, (77/78):345-348.

Armitage, D., Marschke, M. & Plummer, R. 2008. Adaptive co-management and the paradox of learning. *Global Environmental Change*, 18(1):86-98.

Arts, J., Runhaar, H.A., Fischer, T.B., Jha-Thakur, U., Laerhoven, F.V., Driessen, P.P. & Onyango, V. 2016. The effectiveness of EIA as an instrument for environmental governance: reflecting on 25 years of EIA practice in the Netherlands and the UK. *Progress in Environmental Assessment Policy, and Management Theory and Practice*:171-210.

Bailey, J.M. & Saunders, A. 1988. Ongoing environmental impact assessment as a force for change: JM Bailey and AN Saunders illustrate how continuous EIA has influenced an Australian minerals processing plant. *Project Appraisal*, 3(1):37-42.

Bartlett, R.V. & Kurian, P.A. 1999. The theory of environmental impact assessment: implicit models of policy making. *Policy & Politics*, 27(4):415-433.

Becker, S., Bryman, A. & Ferguson, H. 2012. *Understanding research for social policy and social work 2E: themes, methods and approaches*. policy press.

Benson, J.F. 2003. What is the alternative? Impact assessment tools and sustainable planning. *Impact Assessment and Project Appraisal*, 21(4):261-280.

. Betey, C. B., & Godfred, E. (2013). Environmental impact assessment and sustainable development in Africa: A critical review. *Environment and Natural Resources Research*, 3(2), 37.

Bhattacharjee, A. (2012). *Social science research: Principles, methods, and practices*. University of South Florida.

Bilgin, A. 2015. Analysis of the environmental impact assessment (EIA) directive and the EIA decision in Turkey. *Environmental Impact Assessment Review*, 53:40-51.

Blackmore, A.C. 2018. Rediscovering the origins and inclusion of the public trust doctrine in South African environmental law: a speculative analysis. *Review of European, Comparative & International Environmental Law*, 27(2):187-198.

Bond, A., Morrison-Saunders, A. & Pope, J. 2012. Sustainability assessment: the state of the art. *Impact Assessment and Project Appraisal*, 30(1):53-62.

Botha, H. 2018. *Analysing the factors that influence the procedural efficiency of the Environmental Impact Assessment (EIA) Process in the Western Cape Province*. North-West University.

- Boud, D., & Walker, D. (1991). *Experience and Learning: Reflection at Work. EAE600 Adults Learning in the Workplace: Part A*. Adult and Workplace Education, Faculty of Education, Deakin University, Geelong, Victoria, Australia 3217.
- Brown, A. & Hill, R. 1995. Decision-scoping: making EA learn how the design process works. *Project appraisal*, 10(4):223-232.
- Chávez, B.V. & Bernal, A.S. 2008. Planning hydroelectric power plants with the public: a case of organizational and social learning in Mexico. *Impact Assessment and Project Appraisal*, 26(3):163-176.
- Cilliers, D., Van Staden, I., Roos, C., Alberts, R. & Retief, F. 2020. The perceived benefits of EIA for government: a regulator perspective. *Impact Assessment and Project Appraisal*, 38(5):358-367.
- Clark, T., Foster, L., Sloan, L., & Bryman, A. (2021). *Bryman's social research methods*. Oxford University Press.
- Cohen, W.M. & Levinthal, D.A. 1989. Innovation and learning: the two faces of R & D. *The economic journal*, 99(397):569-596.
- Cruz, F.B., Veronez, F.A. & Montañó, M. 2018. Evidence of learning processes in EIA systems. *Impact Assessment and Project Appraisal*, 36(3):242-252.
- de Oliveira, A.R. & Partidário, M. 2020. You see what I mean?—A review of visual tools for inclusive public participation in EIA decision-making processes. *Environmental Impact Assessment Review*, 83:106413.
- DFFE. 2021. *National Screening Tool*. (National Screening Tool). <https://screening.environment.gov.za/screeningtool/#/pages/welcome> Date of access: 20 November 2021.
- Diduck, A. & Mitchell, B. 2003. Learning, public involvement and environmental assessment: A Canadian case study. *Journal of environmental assessment policy and management*, 5(03):339-364.
- Diduck, A., Sinclair, A.J., Hostetler, G. & Fitzpatrick, P. 2012. Transformative learning theory, public involvement, and natural resource and environmental management. *Journal of Environmental Planning and Management*, 55(10):1311-1330.

- Dreyfus, D.A. & Ingram, H.M. 1976. The National Environmental Policy Act: a view of intent and practice. *Nat. Resources J.*, 16:243.
- Elliott, I.C. 2020. Organisational learning and change in a public sector context. *Teaching Public Administration*, 38(3):270-283.
- Fiol, C.M. & Lyles, M.A. 1985. Organizational learning. *Academy of management review*, 10(4):803-813.
- Fiorino, D.J. 2001. Environmental policy as learning: a new view of an old landscape. *Public administration review*, 61(3):322-334.
- Fischer, D. 2017. *Strategic Environmental Assessment (SEA) Supporting the Transition to Renewable Energy in South Africa*. University of Johannesburg (South Africa).
- Fitzpatrick, P. 2006. In It Together: Organizational Learning Through Participation In Environmental Assessment. *Journal of Environmental Assessment Policy and Management (JEAPM)*, 8(02):157-182.
- Fitzpatrick, P. 2010. In it together: organizational learning through participation in environmental assessment. In. *Tools, Techniques And Approaches For Sustainability: Collected Writings in Environmental Assessment Policy and Management*: World Scientific. pp. 267-292.
- Fitzpatrick, P., Sinclair, A.J. & Mitchell, B. 2008. Environmental impact assessment under the Mackenzie valley resource management act: deliberative democracy in Canada's North? *Environmental Management*, 42(1):1-18.
- Gazzola, P., Jha-Thakur, U., Kidd, S., Peel, D. & Fischer, T. 2011. Enhancing environmental appraisal effectiveness: Towards an understanding of internal context conditions in organisational learning. *Planning Theory & Practice*, 12(2):183-204.
- Gibson, R.B. 2001. *Specification of sustainability-based environmental assessment decision criteria and implications for determining "significance" in environmental assessment*. Canadian Environmental Assessment Agency Ottawa.
- Glasson, J., Therivel, R., Weston, J., Wilson, E. & Frost, R. 1997. EIA-learning from experience: Changes in the quality of environmental impact statements for UK planning projects. *Journal of Environmental Planning and Management*, 40(4):451-464.

- Glennon, R., Hodgkinson, I. & Knowles, J. 2019. Learning to manage public service organisations better: A scenario for teaching public administration. *Teaching Public Administration*, 37(1):31-45.
- Hasan, M.A., Nahiduzzaman, K.M. & Aldosary, A.S. 2018. Public participation in EIA: A comparative study of the projects run by government and non-governmental organizations. *Environmental Impact Assessment Review*, 72:12-24.
- Huber, G.P. 1991. Organizational learning: The contributing processes and the literatures. *Organization science*, 2(1):88-115.
- Jain, S. & Jain, P. 2017. The rise of renewable energy implementation in South Africa. *Energy Procedia*, 143:721-726.
- Jay, S., Jones, C., Slinn, P. & Wood, C. 2007. Environmental impact assessment: Retrospect and prospect. *Environmental impact assessment review*, 27(4):287-300.
- Jones, M. 2016. *Exploring the role of Environmental Impact Assessment (EIA) in organisational learning and transformation*. 2016: Murdoch University. (Dissertation).
- Jones, M. & Morrison-Saunders, A. 2017. Understanding the long-term influence of EIA on organisational learning and transformation. *Environmental Impact Assessment Review*, 64:131-138.
- Kabir, S.Z. & Momtaz, S. 2014. Sectorial variation in the quality of environmental impact statements and factors influencing the quality. *Journal of Environmental Planning and Management*, 57(11):1595-1611.
- Khalidi, K. 2017. Quantitative, qualitative or mixed research: which research paradigm to use? *Journal of Educational and Social Research*, 7(2):15-15.
- Khan, N.A. & Khan, A.N. 2019. What followers are saying about transformational leaders fostering employee innovation via organisational learning, knowledge sharing and social media use in public organisations? *Government Information Quarterly*, 36(4):101391.
- Kidd, E., Donnelly, S. & Christiansen, M.H. 2018. Individual differences in language acquisition and processing. *Trends in cognitive sciences*, 22(2):154-169.
- Kivunja, C. & Kuyini, A.B. 2017. Understanding and applying research paradigms in educational contexts. *International Journal of higher education*, 6(5):26-41.

- Koch, P. & Hauknes, J. 2000. On policy learning and the interaction between policy makers and researchers. *Workpackage Synthesis Report, WP4*,
- Kolb, D.A. & Goldman, M.B. 1973. Toward a typology of learning styles and learning environments: an investigation of the impact of learning styles and discipline demands on the academic performance, social adaptation and career choices of MIT seniors.
- Kriel, B.J. 2010. *A critical review of the consideration of energy alternatives in environmental impact assessment (EIA)*. North-West University.
- Kuhn, T. 1970. Reflections on my Critics. *Lakatos, I. and A. Musgrave*,
- Lam, A. 2000. Tacit knowledge, organizational learning and societal institutions: An integrated framework. *Organization studies*, 21(3):487-513.
- Lewis, J., Ritchie, J., Ormston, R. & Morrell, G. 2003. Generalising from qualitative research. *Qualitative research practice: A guide for social science students and researchers*, 2:347-362.
- Loomis, J.J. & Dziedzic, M. 2018. Evaluating EIA systems' effectiveness: a state of the art. *Environmental Impact Assessment Review*, 68:29-37.
- Lyles, M.A. 2014. Organizational Learning, knowledge creation, problem formulation and innovation in messy problems. Vol. 32. pp. 132-136: Elsevier.
- Macintosh, A. 2010. The Australian Government's environmental impact assessment (EIA) regime: using surveys to identify proponent views on cost-effectiveness. *Impact Assessment and Project Appraisal*, 28(3):175-188.
- Martin, L. & Morrison-Saunders, A. 2015. Determining the value and influence of informal strategic advice for environmental impact assessment: Western Australian perspectives. *Impact Assessment and Project Appraisal*, 33(4):265-277.
- McLauchlan, A. & João, E. 2019. Recognising 'learning 'as an uncertain source of SEA effectiveness. *Impact Assessment and Project Appraisal*, 37(3-4):299-311.
- Mezirow, J. 2003. Transformative learning as discourse. *Journal of transformative education*, 1(1):58-63.
- Morgan, R.K. 2012. Environmental impact assessment: the state of the art. *Impact assessment and project appraisal*, 30(1):5-14.

- Morrison-Saunders, A. 1996. Environmental impact assessment as a tool for ongoing environmental management. *Project Appraisal*, 11(2):95-104.
- Morrison-Saunders, A. & Bailey, M. 2009. Appraising the role of relationships between regulators and consultants for effective EIA. *Environmental Impact Assessment Review*, 29(5):284-294.
- Morrison-Saunders, A., Arts, J., Baker, J. & Caldwell, P. 2001. Roles and stakes in environmental impact assessment follow-up. *Impact Assessment and Project Appraisal*, 19(4):289-296.
- Morrison-Saunders, B.a. 2012. *Sustainability Assessment*. 1. London: Routledge. (Sustainability Assessment: Pluralism, practice and progress).
- Nakumuryango, A. & Inglesi-Lotz, R. 2016. South Africa's performance on renewable energy and its relative position against the OECD countries and the rest of Africa. *Renewable and Sustainable Energy Reviews*, 56:999-1007.
- Never, B. 2012. Collective learning through climate knowledge systems: The case of South Africa. *Politikon*, 39(2):231-256.
- Norgaard, R.B. 2004. Learning and knowing collectively. *Ecological Economics*, 49(2):231-241.
- O'leary, Z. 2017. *The essential guide to doing your research project*. Sage.
- Ortolano, L. & Shepherd, A. 1995. Environmental impact assessment: challenges and opportunities. *Impact assessment*, 13(1):3-30.
- Pöder, T. & Lukki, T. 2011. A critical review of checklist-based evaluation of environmental impact statements. *Impact Assessment and Project Appraisal*, 29(1):27-36.
- Rahi, S. 2017. Research design and methods: A systematic review of research paradigms, sampling issues and instruments development. *International Journal of Economics & Management Sciences*, 6(2):1-5.
- Rashman, L., Withers, E. & Hartley, J. 2009. Organizational learning and knowledge in public service organizations: A systematic review of the literature. *International journal of management reviews*, 11(4):463-494.
- Ratshibvumo, T. 2016. *An investigation into the incorporation of sustainability principles in the Environmental Management Programme and Social and Labour Plan for a gold mine, South Africa*. North-West University (South Africa), Potchefstroom Campus.

- Reese, H.W. 2011. The learning-by-doing principle. *Behavioral development bulletin*, 17(1):1.
- Rehman, A.A. & Alharthi, K. 2016. An introduction to research paradigms. *International Journal of Educational Investigations*, 3(8):51-59.
- Retief, F., Bond, A., Pope, J., Morrison-Saunders, A. & King, N. 2016. Global megatrends and their implications for environmental assessment practice. *Environmental Impact Assessment Review*, 61:52-60.
- Republic of South Africa. National Environmental Management Act. 1998.
- Republic of South Africa. Environmental Impact Assessment Regulations, 2014
- Republic of South Africa. National Environmental Management Laws Amendment Act 25 of 2014
- Republic of South Africa. Local Government: Municipal Systems Act 32 of 2000
- Roos, C., Cilliers, D., Retief, F., Alberts, R. & Bond, A. 2020. Regulators' perceptions of environmental impact assessment (EIA) benefits in a sustainable development context. *Environmental Impact Assessment Review*, 81:106360.
- Rossouw, N. & Wiseman, K. 2004. Learning from the implementation of environmental public policy instruments after the first ten years of democracy in South Africa. *Impact Assessment and Project Appraisal*, 22(2):131-140.
- Ryan, G. 2018. Introduction to positivism, interpretivism and critical theory. *Nurse researcher*, 25(4):41-49.
- Saldaña, J. 2014. Coding and analysis strategies. In. *The Oxford handbook of qualitative research*.
- Sánchez-Triana, E. & Ortolano, L. 2001. Organizational learning and environmental impact assessment at Colombia's Cauca Valley Corporation. *Environmental Impact Assessment Review*, 21(3):223-239.
- Sanchez, L. & Morrison-Saunders, A. 2010. Organizational learning in an EIA agency.
- Sánchez, L.E. & Morrison-Saunders, A. 2010. Teaching impact assessment: results of an international survey. *Impact Assessment and project appraisal*, 28(3):245-250.

- Sánchez, L.E. & Morrison-Saunders, A. 2011. Learning about knowledge management for improving environmental impact assessment in a government agency: The Western Australian experience. *Journal of environmental management*, 92(9):2260-2271.
- Sánchez, L.E. & Mitchell, R. 2017. Conceptualizing impact assessment as a learning process. *Environmental Impact Assessment Review*, 62:195-204.
- Sandham, L., Van Heerden, A., Jones, C., Retief, F. & Morrison-Saunders, A. 2013. Does enhanced regulation improve EIA report quality? Lessons from South Africa. *Environmental Impact Assessment Review*, 38:155-162.
- Scheepers, E.Y. 2019. *The improvement of Environmental Impact Assessment Report quality for Solar Photovoltaic projects in South Africa*. North-West University (South Africa).
- Silva, A.W.L.d., Steil, A.V. & Selig, P.M. 2013. Learning in organizations as outcome of environmental assessment processes. *Ambiente & Sociedade*, 16:129-152.
- Soiferman, L. K. (2010). Compare and Contrast Inductive and Deductive. *Research Approaches, sl: University of Manitoba*.
- Suzuki, K. 2002. Organizational learning capacity of policy-making system for financial system recovery: the case of Sweden with some suggestions to Japan. *Japan Public Choice Society (July)*,
- Taylor, C.M., Gallagher, E.A., Pollard, S.J., Rocks, S.A., Smith, H.M., Leinster, P. & Angus, A.J. 2019. Environmental regulation in transition: Policy officials' views of regulatory instruments and their mapping to environmental risks. *Science of the total environment*, 646:811-820.
- Van der Linde, M. 2009. *National Environmental Management Act 107 of 1998 (NEMA)*. Juta Law.
- Veronez, F.A. & Montaña, M. 2015. EIA Effectiveness: conceptual basis for an integrative approach. In. IAIA15 Conference Proceedings: Impact Assessment in the Digital Era,(April).
- Webler, T., Kastenholz, H. & Renn, O. 1995. Public participation in impact assessment: a social learning perspective. *Environmental impact assessment review*, 15(5):443-463.
- Webster, J. & Watson, R.T. 2002. Analyzing the past to prepare for the future: Writing a literature review. *MIS quarterly*:xiii-xxiii.
- Weston, J. 2000. EIA, decision-making theory and screening and scoping in UK practice. *Journal of environmental planning and management*, 43(2):185-203.

ANNEXURE A: INTERVIEW CONSENT FORM



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25 August 2021

To whom it may concern

RE: RESEARCH AS PART OF A MASTERS IN ENVIRONMENTAL MANAGEMENT

The purpose of this letter is twofold: First, this letter serves to confirm that I, Mrs. Carli Van Niekerk (personel number: 13177389), is a lecturer at the Department of Geography and Environmental Management at the North West University. Secondly, this letter confirms that I have been appointed as the research supervisor for Ms. Mavisha Nariansamy (student number: 27648397).

We kindly request your Department's or company's co-operation in terms of either providing documents or partaking in interviews as part of Ms. Nariansamy's research. The title of her research is: *'Investigating the influence of Environmental Impact Assessment on organizational learning in renewable energy projects from a regulator's perspective.'*

With regards to confidentiality, it is important to note that the names of Departments, consultancy firms, government officials or any other role players will not be mentioned in the research and will be treated as strictly confidential. The purpose of the research is not to expose anyone but rather to learn from experience in order to advance the practice of EIA.

We trust that you find the above in order. If there are any uncertainties or additional information required, please feel free to contact me.

Yours sincerely

Carli van Niekerk

Good day Sir/Madam

My name is Mavisha Nariansamy, and I am a student currently enrolled at the North-West University for a Masters Degree in Environmental Management. For your reference, my student number is 27648397. I am conducting a research study aimed at understanding how regulator participation in the Environmental Impact Assessment (EIA) process influences organizational learning for renewable energy projects.

I would like to invite you to participate in this research, due to your professional capacity as a regulator involved in the EIA process. Your participation is entirely voluntary, and no risks or discomforts are foreseen for the you (the participant).

Should you consent, your participation would be involving the following:

- The completion of the attached semi-structured interview questions. The interview questions are sent prior to the interview;
- In order to understand the richness of personal experience and individual perspectives, the researcher would prefer to conduct a virtual interview. However, the participant may choose to respond in writing or via the virtual interview. The virtual interview can be held as per the participants convenience (via telephonic interviews, MS Teams, Skype or Zoom).;
- During the interviews, a recorder will be used in order to correctly capture all the information. These recordings will be available upon request and will be strictly confidential with no sharing outside the context of this particular research study.
- It is anticipated that the virtual interview would take between 30 minutes - 45 minutes. However, a written response may take less time dependent on the individual responses.

N.B Please respond via email to indicate a suitable time for me to arrange the virtual meeting if this is your preference.

Although there is no financial remuneration for your participation, the knowledge shared with the researcher is extremely valuable in contributing to the existing EIA literature. An understanding will be gained for the regulators perspective of learning through EIA participation.

Your participation will be highly appreciated in assisting with the completion of this research.



Kind Regards
Mavisha Nariansamy

CONSENT FORM

1. Research topic: Investigating the influence of regulator participation in Environmental Impact Assessment on organizational learning: A focus on renewable energy projects.
2. I _____, hereby grant consent for my participation in this research project.
3. In giving my consent, I _____, acknowledge that:
 - I have read the Participant Information Statement and have been given the opportunity to discuss the information and my involvement in the project with the researcher.
 - I understand that being in this study is completely voluntary – I am not under any obligation to consent.
 - The participant is free to not answer those questions she/he is comfortable with and may at any time refuse to answer particular questions.
 - The procedures required for the project and the time involved have been explained to me in a language and in manner that I understood.
 - I understand that there is no compensation for participant's time, but the research findings will be available on request.
 - I understand that my involvement is strictly confidential. I understand that any research data gathered from the results of the study may be published; however, no information about me will be used in any way that is identifiable.
 - I understand that I can withdraw from the study at any time, without affecting my relationship with the researcher or the North-West University.

Participant consent

Signature _____ Place _____ Date _____

Researcher confirmation

I _____ hereby confirm that the contents of this document were explained to the participant in a language and manner that he /she could understand.

Signature _____ Place _____ Date _____

If you need more information about the research, please contact the following persons:

Research supervisor

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Researcher /Student

Ms Mavisha Nariansamy

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PARTICIPANT INFORMATION STATEMENT

Research Title: *Investigating the Influence of Regulator Participation in Environmental Impact Assessment on Organisational Learning*

Research motivation and context: This research is motivated by trying to understand how participation in the EIA process has influenced learning for regulators. I have selected renewable energy developments as a focus of this research due to the relatively new and rapid growth in renewable energy technology since 2011. There has also been a burst of EIAs undertaken as part of the country's shift to renewable energy.

Regulators play an important role in the EIA process in South Africa for over 20 years through their involvement as a competent or commenting authority. It stands to reason that although regulators were experienced with developmental projects in the civil, mining, tourism, agriculture and conservation sectors, renewable energy would have required a steep learning curve so as to grow with technology and alternative energy requirements. This is thought to influence new information and/or issues within the EIA process.

Organizational learning is a process which results in a change in an organisation's knowledge which occurs as a function of experience. This experience occurs at an individual level and can be absorbed throughout the organization (or department). It is considered to occur through; (1) Information acquisition, (2) Information interpretation and (3) retaining information in the organization memory.

Renewable energy EIA would have new technology outside those seen in traditional developmental projects. As such, the scope and content of the EIAs may differ from other technologies. This research aims to find out if regulators can gain learnings through their participation or involvement (at any capacity) in the EIA process. I would also like to understand how these lessons are then used by the organization and absorbed by the organization's memory.

For the purposes of this study, the following terms are applicable:

Regulator participation entails involvement as either a competent authority or commenting authority.

Renewable Energy EIA projects include the entire EIA process as defined by the (published under Government Notice Regulation (GNR) 982 of 4 December 2014, as amended) promulgated in terms National Environmental Management Act (Act 108 of 1998, as amended).

Learning refers to gained knowledge which can be acquired through experience, formal or informal methods.

INTERVIEW QUESTIONS

Research Question: *What is the influence of participation in environmental impact assessment on organizational learning from a regulator perspective?*

DEMOGRAPHIC INFORMATION

1. Your role with regard to the EIA participation (mark with X)

Competent Authority	☐	Commenting Authority	☐
Planning and Policy	☐	Other	☐

2. Years of experience

< 3 years	☐	3 – 5 years	☐
5 – 10 years	☐	> 10 years	☐

3. Formal Training

Yes	☐	No	☐
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A. INVESTIGATING EIA AND LEARNING

1. What is your view on the potential of learning through EIA participation in general?
2. Please explain who you think can learn from participation in the EIA process.
3. Which stages or aspects of the EIA process do you believe has the potential to derive the most learning for regulators? Please explain.

B. INVESTIGATING WHAT HAS BEEN LEARNT (LEARNING OUTCOMES) THROUGH EIA PARTICIPATION

1. In what capacity have you participated or been involved in Renewable Energy EIA processes?
2. Have you developed new skills or knowledge through your participation in EIA for renewable energy projects when compared to traditional energy or developmental projects? Please elaborate on the skills or new knowledge, and at which point in the EIA process this was gained.

C. INVESTIGATING HOW LEARNING SHARED THROUGH THE ORGANIZATION.

1. How is knowledge or new learnings gained through EIA participation shared within the organisation?
2. What resources are available within the organization to help you acquire new skills regarding renewable energy projects? Do these facilitate further understanding of Renewable Energy projects?

Resources may include internal and external training (courses, review of academic literature, news, databases and GIS tools), informal means (transfer of knowledge (Central database where certain conditions are captured, other learning for example audit reports and feedback on

effectiveness of mitigation measures, etc.) and experience from colleagues), prescriptive means (checklists, guidelines and legislation) or a combination, formal training.

D. HAVE LEARNING OUTCOMES GAINED THROUGH REGULATOR PARTICIPATION IN EIA BEEN USED TO INFLUENCE ORGANIZATIONAL LEARNING?

1. Can you think of an example where you have been able to use/ or apply the lessons you have learnt during your participation in renewable energy EIA process for other projects or to streamline procedural processes?
2. Are you aware of instances where there has been a change (thinking, behaviours, ways to undertake tasks or procedures) within your organization as a result of gained learning through the EIA process?
3. Is there strong evidence of better department relations, development of otherwise absent expertise, learning, new partnerships, and better public-private-voluntary sector communication as a result of EIA

ANNEXURE B: ETHICS TRAINING CERTIFICATE



