

**AN INQUIRY INTO THE UNDERLYING CAUSES
OF OBJECTIONS BY GAME RANCHERS TO
POWER LINES ON THEIR PROPERTIES.**

BY

IAN HERBERT GAYLARD

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TERMINOLOGY

- **Boma** – an animal enclosure, usually constructed to keep captured game animals before transporting to their destination and in which they may be kept in order to acclimatise to their surroundings.
- **Boundary people** – employees who interact with external customers/stakeholders.
- **Bush clearing** – the term used for the removal of vegetation along a power line RoW.
- **Commercial hunting** – sale of hunting packages to hunters.
- **Footprint** – the extent of damage caused by activity.
- **Game rancher** – the owner or appointed person interviewed.
- **Game ranching/farming** – farming of wild game.
- **Ground profile** – a longitudinal section of the ground indicating ground elevation and features along a proposed power line alignment.
- **Kraal** – an enclosure constructed to contain animals with the purpose of protecting them from predators.
- **Non-consumptive eco tourism** – only game viewing is permitted; no hunting.
- **Optimising** – the selecting and placing of structures or towers optimally along the proposed power line alignment.
- **Pegging** – demarcating the actual structure and tower position in the field.
- **Rights Acquisition** – obtaining legal authorisation to construct and maintain a power line in a mutually agreed position.
- **Rights of way negotiation** – the negotiation phase of agreeing on the alignment of the power line with the property owner and the signing of the required documents.
- **Route (power line)** - the actual or proposed alignment of the power line.
- **Route selection** – the selection of the proposed power line alignment.
- **Rural power line** - a power line built to supply electricity to rural customers.
- **Stock farming** – farming of domestic live stock, sheep, goats, cattle etc.

ABBREVIATIONS

EMP – environmental management plan

GR – game rancher

kV – kilo Volts

LPU – large power user

RoW – right of way

TSC – technical service centre

ABSTRACT

After many years of being overlooked as a game ranching area and tourist destination in favour of more established areas, the Eastern Cape, in terms of game ranching and tourism has ‘come of age’. It has become a huge industry in the Eastern Cape. Income was initially generated from commercial hunting, followed by non-consumptive eco tourism. As the industry expanded, the true value of game was discovered coupled with games inherent ability to survive with limited human interference has made it an attractive business. These factors and others have encouraged more and more farmers to convert from other forms of farming to game ranching.

With this came the desire to restore their properties back to or as close as possible to its original state. Resulting in ‘emergence’ in the form of ‘resistance to power lines’, because they were seen as hideous and an unnecessary visual intrusion which impacted negatively on tourism and property values etc.

The purpose of this dissertation was to surface the underlying causes for the resistance to power lines. A systems thinking approach was used, which emphasised multiple causes, and by means of systems diagrams gained an understanding of the various issues and arguments that relate to the placing and managing of power lines in rural areas. Key focus areas were motivational theories, mental constructs and factors that contribute to people’s perspectives and worldviews that ultimately influence their behaviour.

1 OVERVIEW

Coega spawns power grid monster

22-Apr-2004: Guy Rogers for planets-voice.org --- THE first fall-out from the Coega industrial development zone (IDZ) has appeared in the form of a proposed monster grid of power lines (650km long by 50m wide, supported by pylons 40m high) to channel electricity down to Port Elizabeth from an Eskom station in KwaZulu Natal.

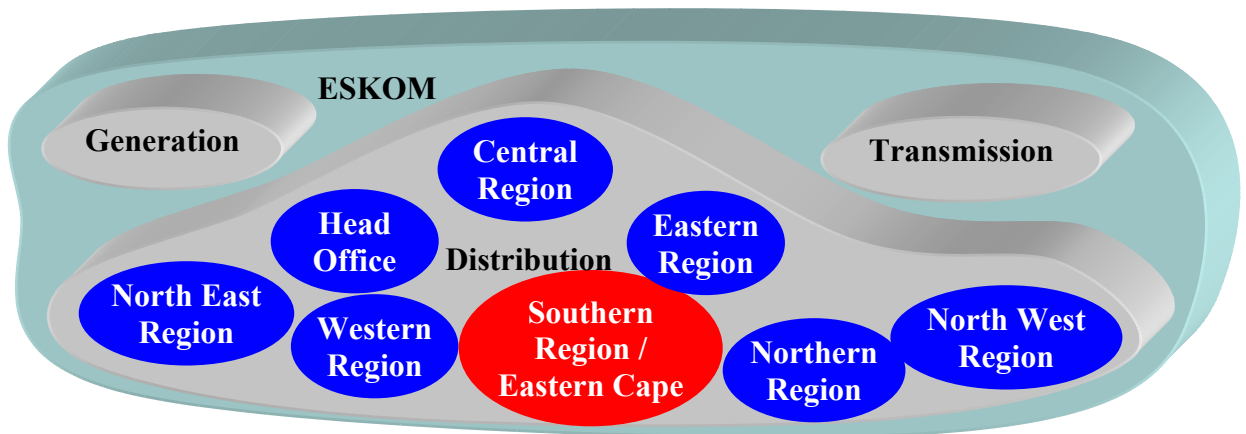
http://www.planets-voice.org/_interface/news.shtml?x=1171

1.1 INTRODUCTION

1.1.1 Eskom Divisions

Eskom consists of three Business Divisions; Generation, Transmission and Distribution. Section 1.1.1.1, 1.1.1.2 & 1.1.1.3 provide a high level overview of the purpose and function of each division.

Figure 1.1: Systems map of Eskom's Divisions and Regions (Business Units) within Distribution



The purpose of this section is to inform the reader of the key functions each division performs in the electricity distribution supply chain, and to indicate the context within which the research is being conducted. Eskom generates, transmits and distributes about 95% of the electricity consumed in South Africa (Anon as cited in Vosloo, 2004: 4). Electricity is a major contributing factor to the success and development of the South African economy. Development and availability of electricity are tightly connected, hence, the importance of Eskom being able to transmit electricity throughout South Africa.

Figure 1.2: The study area in the South African context: Eastern Cape (Southern Region)



Figure 1.3: Southern region and game ranch locations used in the research



1.1.1.1 Generation Division

The purpose of the Generation Division is to generate an adequate supply of electricity for the country's needs. *“Its 25 power stations are mainly coal-fired, but include Africa's only nuclear power station, the world's largest dry-cooled power station and two hydro-electric and two pumped storage schemes”* (Eskom, 1998e as cited in Cilliers, 1999: 1). The bulk of the power stations are coal fired and located on the coal deposits in the Northern parts of the country, the majority in Mpumalange Province. However, it needs to be said that not all of the power stations are operational. The electricity generated is then transmitted via transmission lines. Consequently, the vast majority of transmission lines emanate from this area and radiate out across the country.

1.1.1.2 Transmission Division

The purpose of the Transmission Division is to transmit electricity to key points throughout the country. The transmission network consists of approximately 28500km of operational power lines which transmit the electricity. The voltages vary from 132kV to 765kV. Transmission supplies electricity to Distribution's Business Units from which substations are the point of delivery. At this point transformers are used to reduce voltages to 66kV or 132kV, i.e. a 400/66kV transformer reduces the voltage from 400kV to 66kV. Although Distribution is Transmission's main customer, in some instances customers known as Large Power Users (LPU's) are also supplied direct from Transmission.

1.1.1.3 Distribution Division

The purpose of the Distribution Division as mentioned in section 1.1.1.2 is to distribute the electricity to the consumer. To achieve this, 66kV or 132kV power lines, also known as sub-transmission lines, are used to distribute the electricity to its own substations, which are strategically positioned to meet the demand in a given area. Distribution's substations are where 66/22kV or 132/22kV transformers are used to reduce it to usable voltages ie 22kV and 11kV. These lower voltage power lines are referred to as either medium volt (MV) or rural lines; they distribute the electricity to the individual customers. Distribution in turn is divided into a number of Regions (Business Units) (see Figure 1.1).

The Distribution network consists of approximately 44300km of sub-transmission lines, of which approximately 3800km are in the Southern Region (Figure 1.3). This figure is increasing daily as new lines are constructed to meet the demands of customers.

- Increased demand for electricity triggers the need to construct power lines.
- Increase in tourism in turn is driving the game ranching industry

Both have common factors; land and income. This is where the views of the two key stakeholders, Eskom and game ranchers diverge (see Table 2.3). Both require land, but for different purposes. Both are in business to generate income, but the income streams come from different sources.

1.2 PROBLEM STATEMENT

1.2.1 Practitioner

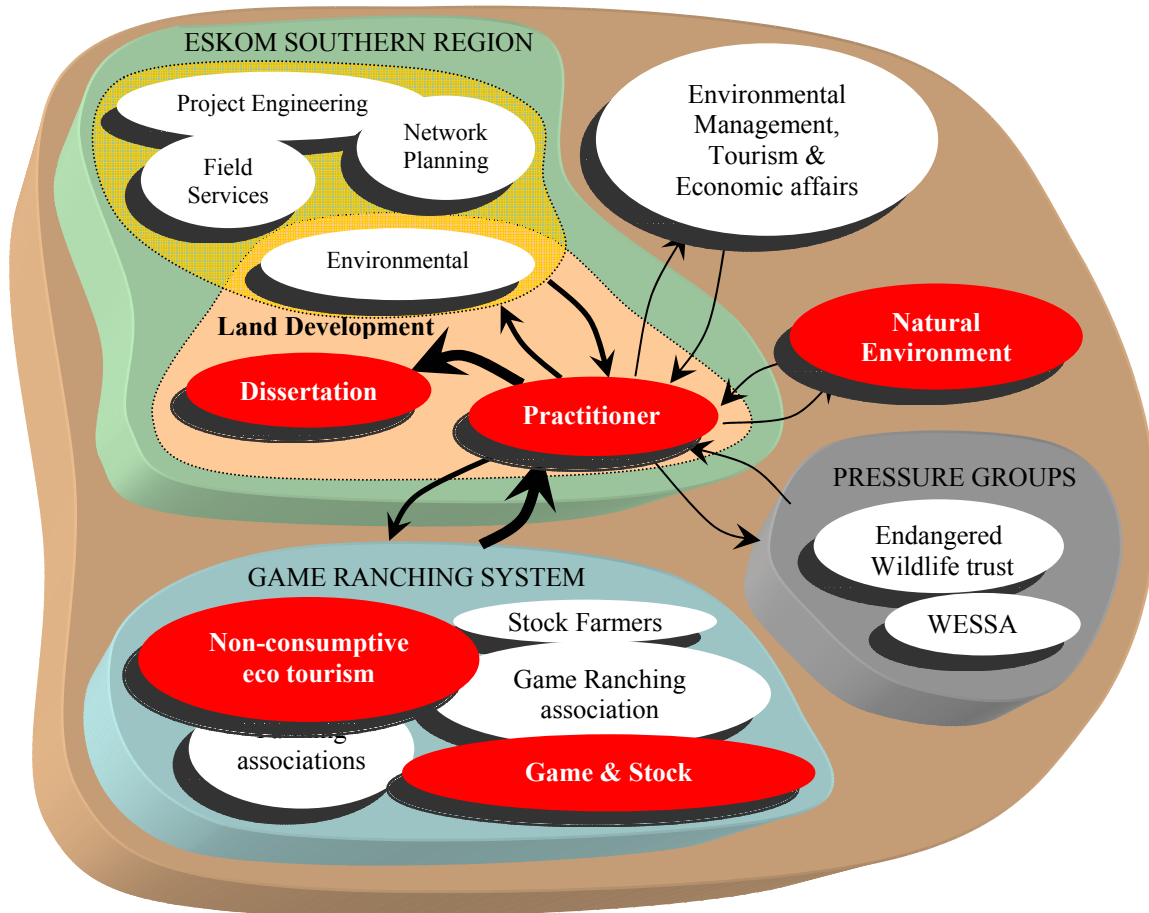
The acquisition of Rights of Way (RoW) for power lines discussed in section 1.1.1.3 is the responsibility of each region. More specifically, the RoW process is performed by practitioners situated within in the Land Development Department as indicated in Figure 1.4. As a practitioner in the environment responsible for ‘Rights Acquisition’ and customer relations, I frequently have to deal with objections and complaints about power line issues. Therefore, using a systems thinking approach, which emphasises multiple causes, and by means of systems diagrams, I want to develop my understanding of the various issues and arguments that relate to the placing and managing of power-lines in rural areas where farmers are making a transition to game ranching from other forms of farming. An informed understanding of these issues could lead to an improvement of the RoW process with game ranchers (GR).

1.2.2 Rights of Way

The voltage of the power line determines the type of RoW required; i.e. building restriction or registered servitude. This is discussed in more detail in section 2.4.1.2. The conversion from traditional stock farming to game ranching has made this activity increasingly difficult (see Table 2.3). It is important to note that the difficulty in obtaining RoW is not only confined to game ranches. An Eskom power line, on land not belonging to Eskom, requires a RoW agreement. This partnership or third party agreement demands a degree of loss of control by the land owner.

For example, Eskom’s RoW stipulates unrestricted access 24 hours per day for maintenance purposes (2.4.2.2).

Figure 1.4: Influence diagram of key stakeholders indicating their level of influence and the position of the practitioner



From a practical point of view, having a vehicle entering a property at night with only the lights visible (no way to identify the vehicle), is of great concern in times where stock theft has become one of the greatest threats (this I have heard with my dealings with them) to the viability of stock farming. Coupled with this, the perceived reduction in attractiveness of the property to potential game ranchers because of visual intrusion, in turn assumed to negatively impact tourism, as a result, obtaining RoW has become problematic.

1.2.3 Stock to Game ranching transition

Over the past two decades, the emphasis on conserving game in the Eastern Cape has changed dramatically. Traditionally game was viewed as a resource that could be hunted in return for business deals, or a social hunt for invited friends. The true value of game was never really explored to any large degree as a form of income. The survival of game was largely dependent on the will of the property owner, coupled with limited hunting regulations.

However, as the demand for hunting increased and hunters indicated a willingness to pay for hunting, a whole new market emerged. The value of game was realized, triggering an event that resulted in game being reintroduced in proportions that probably did not exist at the turn of the century. Collectively, millions of rands are spent annually on the buying and selling of game, for breeding and commercial hunting. Non-consumptive eco tourism followed in the latter years.

Hence, the transition from stock to game ranching because of the financial benefits and desire to preserve or return an area to as close as possible to its former state, which caused emergence in the form of ‘resistance towards construction of power lines’. Worldviews dominated the reasoning i.e. ‘if it is not natural, it doesn’t belong’. Added to this was the perspectives that power lines had a negative impact on the game ranching system (see Table 2.3 and section 4.2).

To transmit and distribute electricity cost effectively, an overhead power line is the only technology available. Due to cost and maintenance disadvantages an under ground cable is not a viable option. The need for Eskom to be able to distribute electricity is clearly evident as indicated in section 1.1.1. Hence, objections to the construction of power lines have far reaching consequences.

1.2.4 Reason for objections

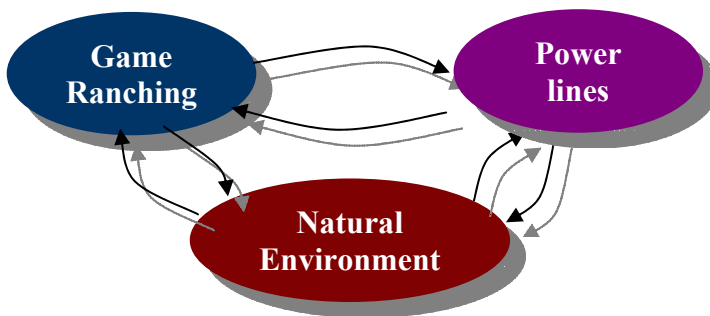
The following are generally the main reasons cited (see Table 2.3):

- Visual intrusion or aesthetical impact which in turn negatively impacts tourism.
- Devaluation of property.
- Security due to third party agreements.

1.2.5 Maintenance of power lines

Game ranching too has an impact on the Transmission and Distribution Electrical System. The multi-directional impacts between power lines and game ranching is becoming more and more evident. The following paragraphs highlight the impacts game ranching has on the maintenance of power lines, with special reference to access, security and safety.

Figure 1.5: Influence diagram indicating directions of influence between systems



1.2.6 Access

Over time, maintenance crews develop mental maps of their areas of responsibility. The more familiar a person is with their surroundings, the quicker they can respond, locate and rectify faults reported on power lines. The emergence of game ranching and the required game fencing along property boundaries has resulted in regular stock farm gates being either removed or fenced off. The sudden loss of access points between properties used for power line inspections, causes delays as maintenance personnel have to locate alternative access points and navigate back to the power line.

1.2.7 Security and game fencing

A regular 1,2m stock fence is adequate for traditional stock farming. It has been the practice of Eskom to install gates on most internal and boundary fences to expedite access along the Right of Way. This is subject to the owner's consent. Eskom locks are placed on the gates as a form of security. The situation of domestic stock escaping to neighbouring properties, although inconvenient, could be rectified fairly easily. The fact that most domestic stock is usually branded, coupled with the owner's knowledge of his animals enable them to be herded and returned. The situation with game is totally different.

The secretive and timid nature of wild animals makes them difficult to catch, if not impossible in certain circumstances, and relocation can be very costly. Hence, game fencing is introduced as a form of security, built to specifications to prevent free movement of game. To reduce the risk of game escaping, owners have in certain circumstances, fenced off the access gates. The only access to the property is via the main entrance. This could be kilometres from the power line resulting in long detours, as the maintenance teams travel between ranches.

1.2.8 Safety

Standby teams ensure faults are repaired 24 hours a day. However, the introduction of dangerous animals on certain ranches has created a safety risk. Sections of lines, depending on access and terrain, can only be accessed by foot. Inspecting lines on foot without protection, especially at night, has created a whole new dynamic for maintenance teams.

1.3 PURPOSE STATEMENT

The purpose of this study is to identify possible root causes of the resistance to power lines by game ranchers. To achieve this, special reference to motivational theories, mental constructs and factors that contribute to the perspectives and worldviews that ultimately influence people's behaviour and their mental models will be explored.

The system of interest for the study will be within the Eastern Cape (Southern Region), while the sample of game ranches selected for the research will most likely be situated in the following areas; Patterson, Grahamstown, Alexandria and Cathcart, Komga and East London areas (Figure 1.3). Although the area of study will be confined to the Eastern Cape, the fact that game ranching within this area is relatively new and problems are now emerging, could present a problem in terms of reviewing/collecting historical data.

Using a method of inquiry, the owners or the delegated representative will be selected to participate in the assembly of data which will be analyzed and interpreted to assist in gaining some insight into game ranchers' perspectives and worldviews. Although, this study is about resistance to power lines by game ranchers, numbers for and against, quantitative values are not the focus of this study.

1.3.1 Key Research Questions

1.3.1.1 Qualitative research questions:

- What impacts do power lines have on game ranches, with special reference to their visual effect and to tourism?
- What impact do other un-natural objects (game drive roads, vehicles, lodges) have on game ranches, with special reference to their visual effect and to tourism?
- Do power lines devalue property? (this can be very subjective, therefore only a potential buyer could determine this)
- Do power lines increase security risk?
- Is maintenance and management of Eskom Distribution power lines and RoW a problem?

These questions will be answered by attaining the following main objectives:

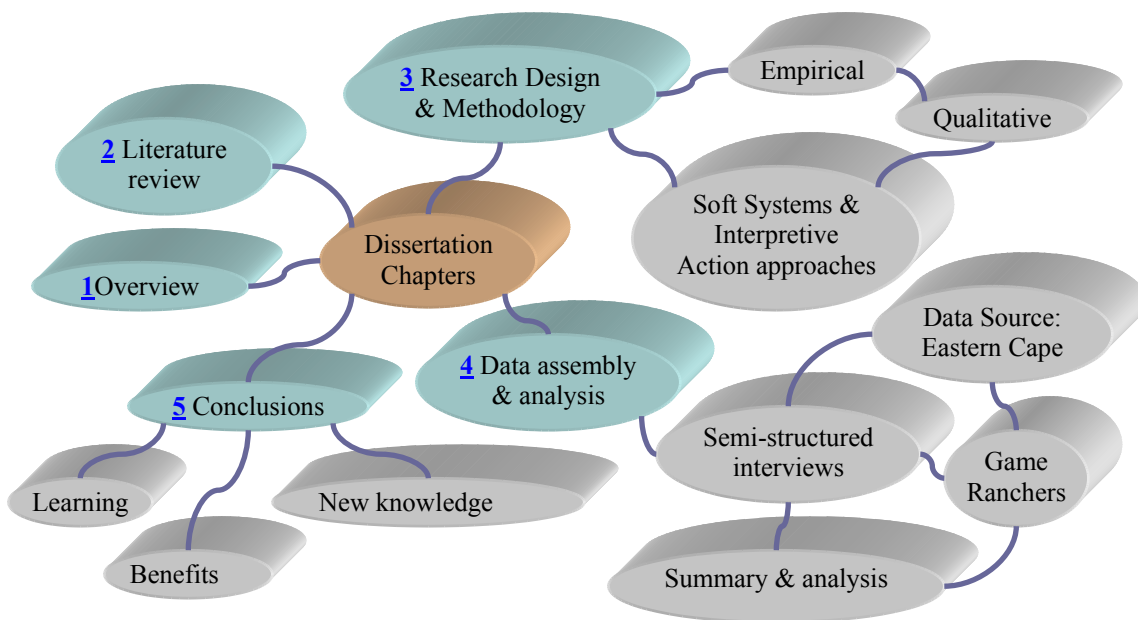
- Conducting unstructured interviews with selected game ranchers.
- Reviewing literature on Stakeholder Theory.
- Reviewing literature on environmental issues: vegetation management etc.
- Reviewing literature on power line structure design.
- Reviewing literature on routing of power lines.
- Collective decision making on procedures to be implemented for maintaining power lines.

However as previously mentioned, very limited literature, directly applicable to my topic, is available. Hence, this literature review may not provide a clear resolution, but should contribute to a better insight into this complex problem.

1.4 RESEARCH METHODOLOGY

The fact that this problem is current, and involves people and emotions, Interpretive Action Research is the preferred methodology. The instrument for data assembly will be unstructured one on one interviews. Although I have extensive experience in dealing with property owners, I have never interviewed stakeholders for the purpose of gathering information for research. I see this as a constraint that needs to be addressed by reading relevant literature and consulting the appropriate people.

Figure 1.6: Holistic view of the conceptual framework of the research.



Due to the roll I perform in obtaining rights for Eskom Distribution, I suspect that the motives for this research may be treated with deep suspicion by game ranchers. Due to the short duration of the interview phase, developing a level of trust will be difficult. However, the frank manner in which I plan to conduct the interviews and the venue being on their own ranches, should contribute to a relaxed environment. With this in mind, trust is earned, not gained; therefore, there will always be an element of distrust, affecting the quality of data. Figure 1.6 is a graphical overview of the research process. Chapter 3, as indicated in Figure 1.6, is dedicated to Research Design and Methodology and will be discussed in more detail.

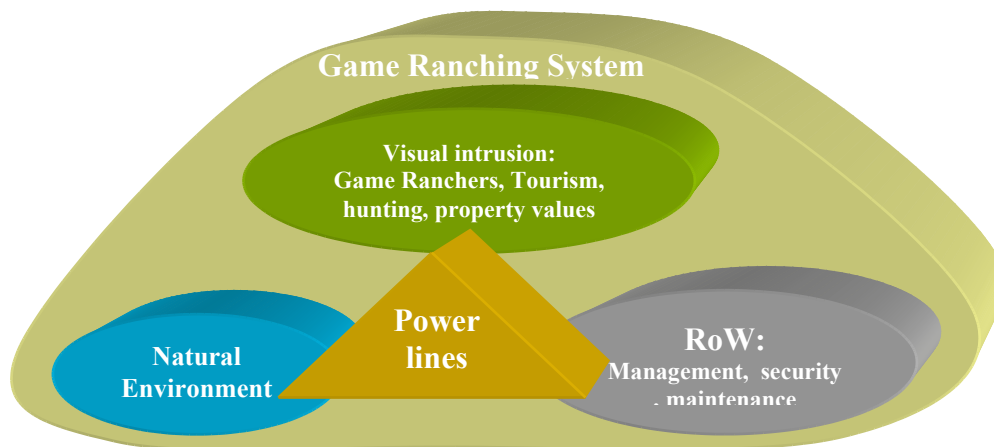
2 LITERATURE REVIEW

‘the general public often consider these power lines to be eyesores thus increasing their opposition to new construction’ (Nieminen & Seppa, 1996)

2.1 OVERVIEW

The purpose of this chapter is to review literature pertaining to the international trend of “antipathy of the general public” (Beaty) towards power lines as “townspeople would like to see all lines buried” (Khasru). Beaty’s and Khasru’s comments are typical of the responses experienced when negotiating Rights of Way. Added to this, the literature is intended to improve understanding of the following areas (see Figure 2.1).

Figure 2.1: System of Interest

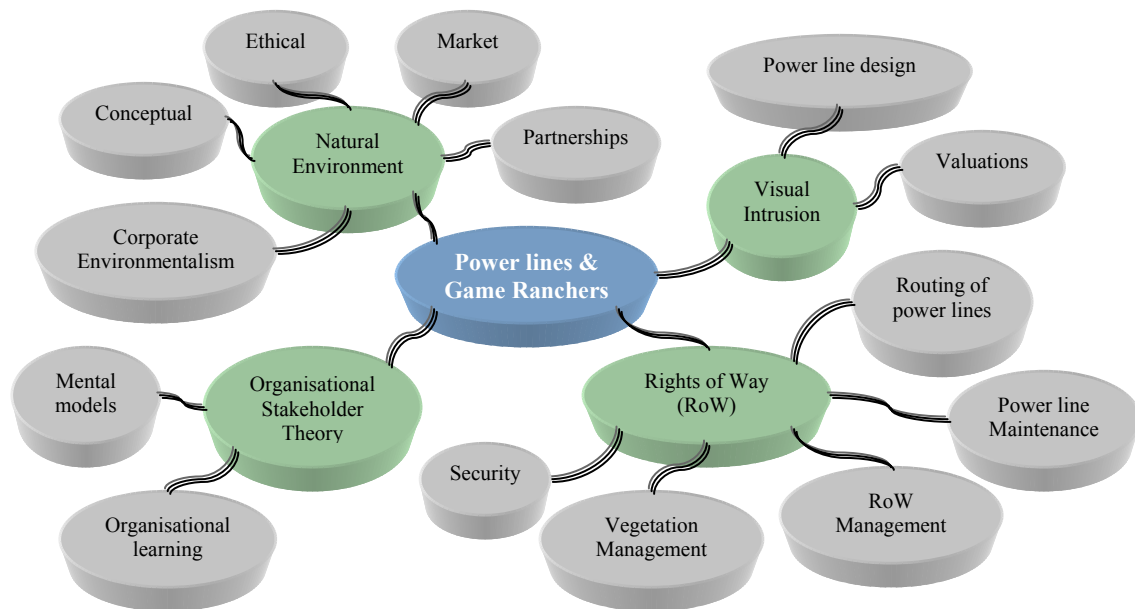


- Visual intrusion
 - Tourism (consumptive and non-consumptive)
 - Power line design
 - Property values
- Rights of Way (RoW)
 - RoW maintenance
 - Power line maintenance

- Vegetation management
- Security
- Organisational Stakeholder Theory
 - Mental models
 - Organisational learning and other topics associated with Stakeholder Theory
- Natural environment

However, the weakness of this literature is its applicability to the South African context with special reference to private ownership of game ranches/game reserves. The strength is that it provides an International perspective.

Figure 2.2: Literature review conceptual frame work



Positioning key systems and sub systems in a hierarchal format for the conceptual framework (Figure 2.2) entailed frequent attempts and in depth reflection. Visual intrusion, for example, is a factor in a number of systems. It had the criteria of a system or sub system, however, the final decision is reflected in the systems map, based on my perspective of how the literature review should be structured.

2.2 ORGANISATIONAL STAKEHOLDER THEORY

2.2.1 Introduction

Stakeholder theory is a concept totally foreign to me in the context of recognising external stakeholders as part of an organisation in which the traditional boundary has expanded and become less distinct. The purpose for including this literature was threefold.

- Increase my understanding of stakeholder theory.
- Could it contribute to improving the current situation if applied?
- Stakeholders have a vital role to play in most spheres of life.

In this case, stakeholders refers to property owners whose property/ies will be affected by overhead power lines. The term affected here implies that some part of the power line or servitude will be on the property in question. Stakeholder identity will be discussed in more detail in this chapter.

Property owners are key stakeholders in Eskom's Transmission and Distribution System. As stakeholders become more aware of their rights, organisations requiring RoW on private land, will need to take note of stakeholder's requests.

Nesteruk (as cited in Lea, 1999: 153) states that "*certain jurisdictions in the United States have recently passed certain other constituencies legislation which determine that directors should not only consider the profit margins in their decisions but also the interests of employees and the general public*"

Could this apply to the Eskom context in which a percentage of profits made from Transmission lines could be distributed to property owners on an annual basis? This would expand Eskom's social responsibility to include individuals, groups and communities. This can be seen as a "*shift in moral perspectives with respect to responsibilities of the modern corporation*" (Lea, 1999: 153). Eskom does compensate property owners, known as 'consideration', but this will be discussed in more detail in section 2.4.

2.2.2 Origin of the word stakeholder

According to Sternberg (1997: 3), *“the word stakeholder first appeared in the management literature in an internal memorandum at the Stanford Research Institute (now SRI International, Inc), in 1963”*.

Sternberg (1997: 3) states that the term generally implied *“stockholder”*, a group to which management was responsive. Thus, the stockholder concept was originally defined as, *“those groups without their support the organization would cease to exist”*.

2.2.3 Definitions

Freeman’s (as cited in Bronn & Bronn, 2003: 293) definition of a stakeholder is *“a group or individual who can have an effect on or be affected by the actions of an organization”*.

Kaler’s (2004: 75) classification of a stakeholder is that of a *“claimant”*, *“that is to say a characterization in terms of an ability to aid or impede whatever strategic aims an organization happens to have”*.

Mitroff (as cited in Bronn & Bronn, 2003: 293) sees the modern organisations as being *“buffeted by a growing disparate array of forces, which he refers to as stakeholders”*. He further goes on to define stakeholders as, *“the concrete entities that affect and in turn are affected by an organizations actions, behaviour and policies”*.

Freeman’s (as cited in Bronn & Bronn, 2003: 293) analogy of an organisation is, *“the firm is seen as a socio-political institution where the lives between the business and its external environment are less distinct”*.

2.2.4 Background to Stakeholder Theory

2.2.4.1 Drivers of change

The roles of organisations are continuously being evaluated as key stakeholders’ perspectives and worldviews of the responsibilities of organisations, emerge.

Bronn and Bronn (2003: 292) state that the drivers of this process come from two general sources.

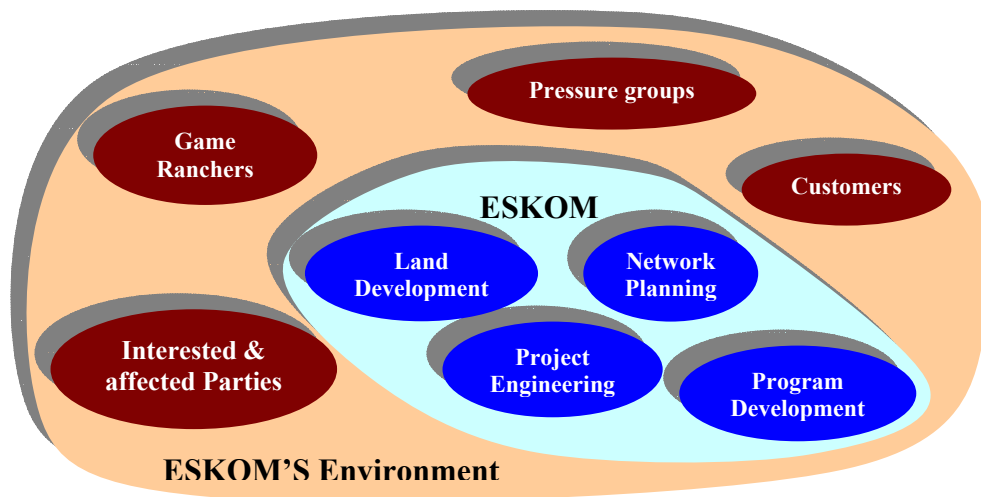
- The first source is the organisation impact on the *“external world. The important drivers are environmental impacts, influences on cultures and effects on globalization”*.

- The second source is internal, the impact of the organisation on its employees. Total quality management (TQM) requires ethical behaviour. Employees' perspectives and worldviews are beginning to have greater impacts on their situations.

2.2.4.2 Systems theory

Stakeholder theory as in Systems theory demands a holistic view of all agents within the system. The two are not mutually exclusive. As is acknowledged by systems practitioners, the whole is greater than the sum of the parts.

Figure 2.3: Systems map displaying examples of stakeholders in the Electricity Distribution System.



2.2.4.3 Influence of stakeholder perspectives

In most situations involving people from diverse backgrounds, with multiple perspectives and worldviews, conflict and complexity can be considered normal.

The key to managing the situation is understanding each other's perspective and worldviews. Agreement is not necessarily expected. An array of perspectives and worldviews potentially create a rich picture to be analysed and understood so that learning can take place.

More often than not, organisational turbulence or ambiguity is deemed as undesirable – *“equilibrium or order is not the conditions for optimal growth in the natural world”* Burges (as cited in April, Macdonald & Vreisendorp, 2003: 5).

Objections to power lines can be seen as turbulence or disorder amongst stakeholders within the electricity distribution system. Subsequently, these issues influence engineers to design more aesthetically pleasing power line structures. Hence, with their ability to influence power line design, it is in Eskom's interest to identify their position and status as stakeholders.

2.2.5 Stakeholder Identification and Types

Deciding who is and is not a stakeholder in terms of recipients for financial benefits could be problematic. If stakeholders are indirectly affected by a power line (the line is visible, but not on the property) are they entitled to some form of consideration and if yes, then how much? These are the complexities associated with stakeholder theory.

“To determine which stakeholder groups are relevant, the industrial marketers must analyze their behaviour and consider how it relates to the business environment. If the marketer can determine which groups can influence its environmental marketing activities or are affected by the firm's environmental marketing activities, it has by definition identified the relevant stakeholder groups” (Polonsky, 1995: 35).

Freeman (as cited in Lea, 1999: 154) implies *“it is not its completeness but its function as a vehicle for re-conceptualizing the firm”*, that is the importance of stakeholder theory. I agree with Freeman, that stakeholder theory is not about a particular model or framework, but a perspective of additional stakeholders, generally excluded from company profits.

Mahoney (1994) (as cited in Lea, 1999: 154) refers to two possible stakeholder types:

“Passive stakeholders, who have a moral claim on the company not to infringe liberties or inflict harm, and ‘active’ stakeholders, those whose claims are more in the nature of welfare rights”.

He further states that *“active stakeholders”* are the more significant group. They have a greater stake in the company:- *“investors, customers, suppliers employees”* etc. have a *“reciprocity relationship”* with the company. The active stakeholder contributes to the functioning and activities of the company, *“unlike passive stakeholders, and to that degree, is entitled to some positive benefit from the company and a share in the ethical responsibility and accountability of the company”*.

“Typically each stakeholder group can potentially have both a positive (i.e. cooperative behaviour) and negative (i.e. threatening behaviour) influence on the organization” (Freeman, 1984; Maranville, 1989; Savage *et al.*, 1991 as cited in Polonsky, 1995: 36). Game ranchers directly affected by power lines in my view, can be classified as active stakeholders.

Kaler (2004: 74) supports stakeholding on condition that *“there is a very restricted version in terms of groupings admitted to stakeholder membership and the extent of responsibilities toward them”*. Kaler (2004: 79) further states that *“neither the environment nor activist groups are stakeholders of a normative sort”*. Phillips (as cited in Kaler, 2004: 75) refers to normative stakeholders as *“groups with a morally legitimate claim to have a business directed towards serving their interest”*.

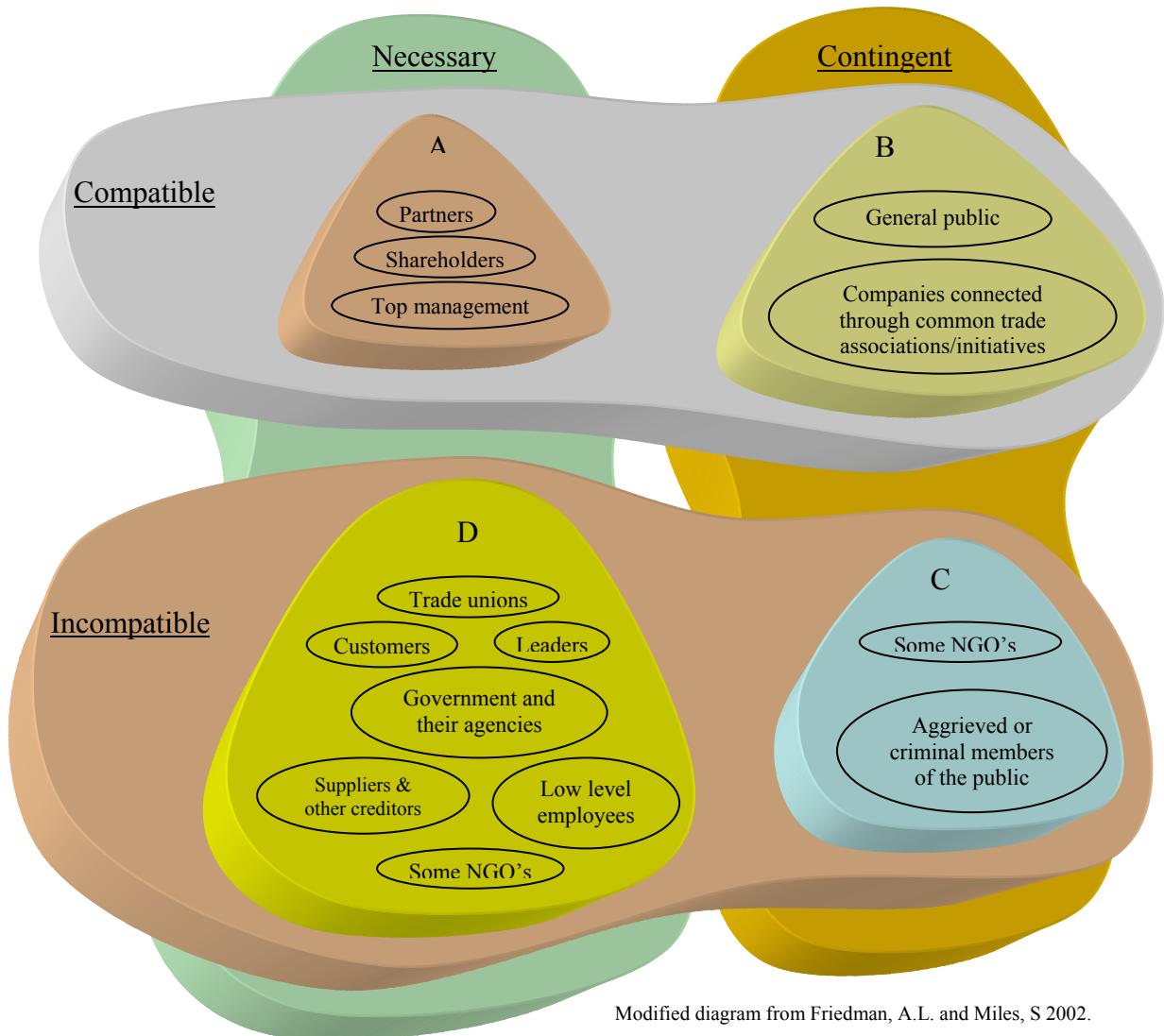
The systems map (Figure 2.4) is a generic display of possible stakeholders. The systems map allows for situational logic and strategic action, their method of interaction and influence of organisations (Friedman & Miles, 2002). Sub system A is influenced by:

- Formal organisational/stakeholder relationship
- Written contracts define conditions
- Institutional support

2.2.5.1 Legitimate stakeholders

Friedman & Miles (2002: 8) suggests that the boundary between those who have legitimate claims, is a contractual one. This suggests that stakeholders in sub system A & D are classified as legitimate stakeholders while stakeholders in sub systems B & C according to Friedman & Miles (2002), would most likely not be considered as stakeholders and at best would be informed of decisions made. Mahoney and Friedman’s views are similar in determining stakeholders.

Stakeholder relationships can change over time for several reasons. Friedman & Miles (2002: 12), use Greenpeace as a typical example. Their approach initially was confrontational (sub system C), however, due to a change in strategy and institutional support, they have essentially moved into sub system D. Hence, the need to monitor stakeholders.

Figure 2.4: Stakeholder Model: Distinguishing different stakeholder types

2.2.6 Stakeholder Monitoring

Monitoring stakeholder relationships is just as important as the creation of the stakeholder relationship. Social audits, with special reference to the stakeholder's expectations, are one way of evaluating the performance of the relationship. What satisfies stakeholders today may not be adequate tomorrow. The gap between performance and expectations needs to be continuously monitored and behaviour modified accordingly, if required.

A typical example is the transition from stock farming to game ranching. Eskom did not manage the system. Only when the situation became unbearable (see section 1.2.5 to 1.2.8) was action considered. Monitoring and managing the stakeholders could have prevented the conflict, by boundary people providing feedback to the organisation.

2.2.7 Mental models, Worldviews and Organisational Learning

2.2.7.1 Definitions

In *The Fifth Discipline Fieldbook*, Senge, Ross, Smith, Roberts and Kleiner (as cited in Christensen, undated: 1) mental models are described as *"the semi-permanent tacit maps of the world which people hold in their long term memory, as well as the short term perceptions which people build up as part of their everyday reasoning processes"*.

Kearney and Kaplan (as cited in Christensen, :1) describe them as *"hypothesized knowledge structures embodying people's assumptions, beliefs, facts and misconceptions about the world"*. They further suggest that mental models provide a framework for *"interpreting new information and for determining appropriate responses to new situations, as well as for guiding people's perceptions, decisions, and behaviour"*.

There are many assumptions citing reasons for game ranchers objecting to power lines on their properties. I am not aware that any of these assumptions have been tested or validated. However, understanding the root causes of a person's action can assist in one's response. During the negotiation process for RoW, both parties probably assume they know each other's expectations, hence, the frustration when negotiations are deadlocked.

2.2.7.2 Mental models

The concept of the mental model is the primary element that distinguishes stakeholders. A mental model is a theory of an individual's understanding of how things work. How factors and the associated inter-relationships combined are used to interpret situations. A common or shared model could be closely equated or compared to organisational culture. Where a group or community have a common goal.

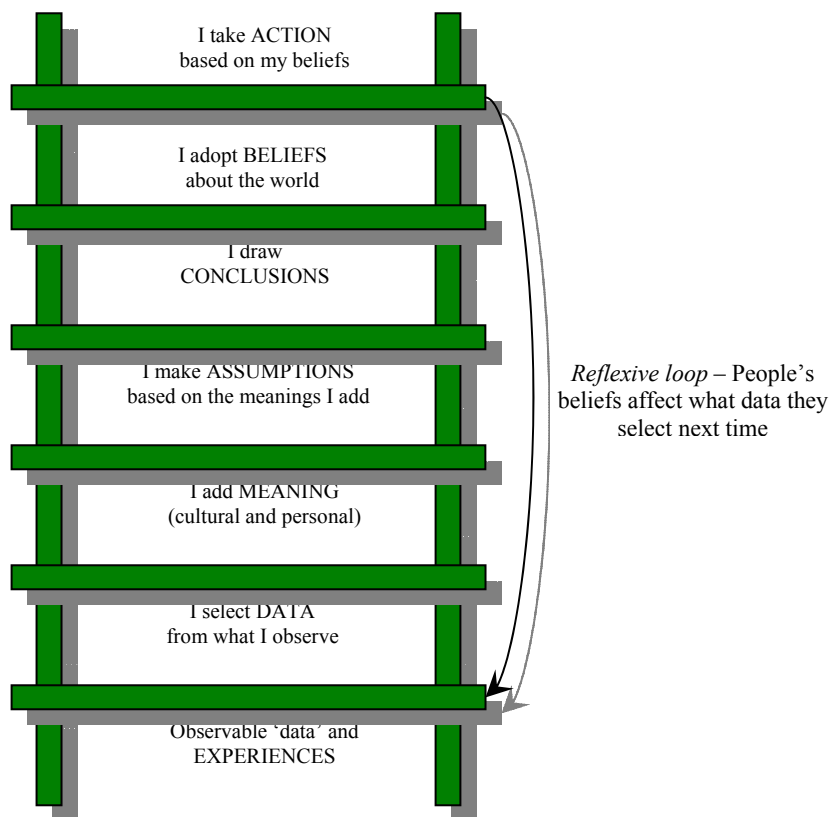
Figure 2.5: The Ladder of inference.

Diagram - Argyris, 1990 (as cited in Bronn & Bronn, 2003: 294)

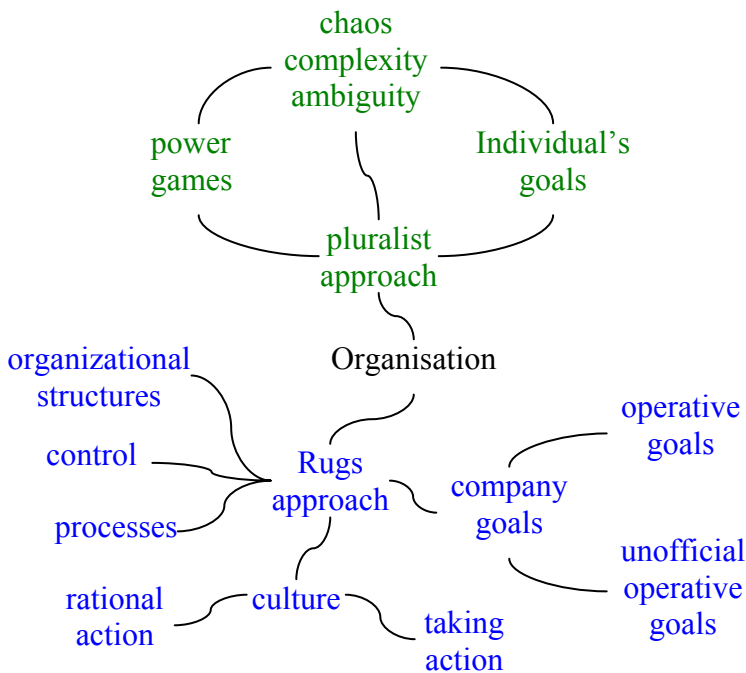
Limitations of “*human cognitive capacity*” result in “*mental models being incomplete representations*” (Bronn & Bronn, 2003: 293). This is where the danger lies. Frequently assumptions are made which in turn influence behaviour and thought processes. This is where the complexity of situations becomes apparent. Mental models develop with time, constructed from past experiences, beliefs, culture etc. Unfortunately, this can lead to self sealing behaviour (see section 4.3.3.3). A typical example is the astronomical and physics communities who rejected the assumptions that meteors periodically strike the earth. Strangely, the evidence of these impacts was always there, but it was not consistent with their beliefs, and thus rejected. This is exactly what Kuhn's paradigm theory predicts, that the world determines what is perceived.

There is a very strong similarity in Kearney and Kaplan's theory in section 2.2.7.1 and the ladder of inference regarding factors that determine our behaviour. Mental models are essential to progress through life.

However, in critical decision making situations, they can become serious liabilities. Communicating with people, who share similar mental models can be easier. Common factors and shared values are conducive to constructive communication and common goal seeking. In most group situations, there are informal and psychological contracts, official and unofficial goals, formal and operative goals and wherever variations occur between any of these, ‘goal displacement’ exists. This all adds to the complexity and the pluralistic nature of many organisations.

Extracts from The Open University, T205: Concept File 4 (2000: 12) course material states – *“Organizations, are they rational....Nevertheless, there are good reasons for arguing that the conception of organizations as unitary entities is at best a half-truth. While there are occasions when even the largest organizations are united, for much of the time in most organizations – and in respect of many issues – unity is the exception rather than the rule. Organizations are better thought of as pluralistic entities: a rich variety of individuals and groups with distinct attitudes, interests and concerns”.*

Figure 2.6: Spray diagram indicating Rational, Unitary, Goal seeking (RUGS) and Pluralistic views of an organisation



It must be understood that similar mental models do not guarantee correctness. Essentially, it means there is a similarity in the conceptual structure of how the world functions from an individual's perspective or worldview. This appears to be typical of game ranchers' perspectives on power lines. By and large their mental models are similar, but not necessarily correct.

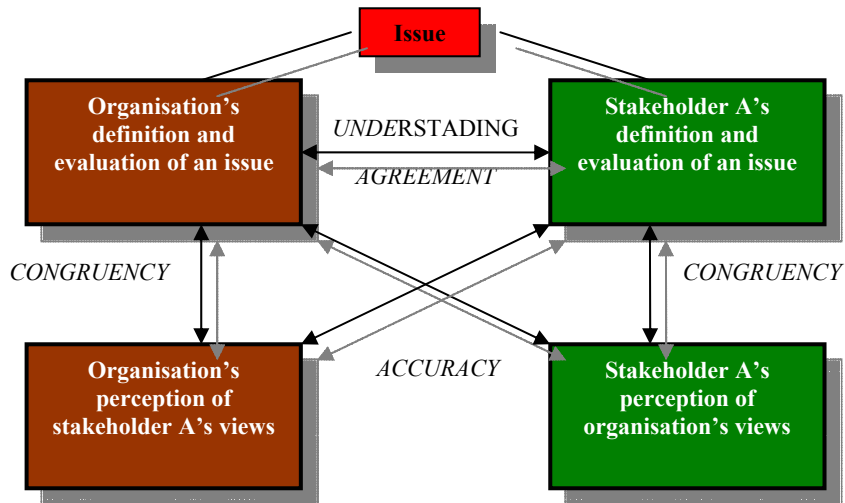
Bronn & Bronn, (2003: 295) state that *“from this perspective, which is strongly influenced by the organizational learning discipline, a primary task of corporate communicators with respect to organizational stakeholders is to work actively to attempt to uncover and understand the stakeholders mental models. This becomes critical to the success of the communications process”*.

One of the objectives of this research is to identify and understand the mental models of game ranchers in order to improve relationships. At the same time, the organisation needs to be prepared to continuously evaluate and modify its own worldviews (see section 2.2.7.3). For this to happen, an organisation needs to reflect on past events and learn from those situations. The mental model concept is central to the Co-orientation Model (Figure 2.7). For this model to be effective, there has to be a degree of agreement and understanding of the problem. Only then can a perception of the other stakeholders view be created. The accuracy of this view will depend on the degree of disclosure of information shared by all parties. The greater the variance in views, the more ineffective communication will be.

For learning to take place, Shannon and Weaver (as cited in Bronn & Bronn, 2003) state that the focus is not on the message sent between sender and receiver but on two or more fundamental aspects of communication. These aspects are problem finding and problem understanding.

Problem finding essentially entails (1) identifying the problem (2) accepting the situation as something which is worth spending resources on (3) defining the situation in terms of objectives and actions to achieve them. Problem understanding refers to the analysis process used to establish most causes and impacts. Typical mess analysis.

McLeod and Chaffee (as cited in Bronn & Bronn, 2003: 296) *“identify three critical types of relationships (Figure 2.7) that define and influence the interactions between organization and a stakeholder”*

Figure 2.7: The Co-orientation model (McLeod and Chaffee)

Dozier and Ehling (as cited in Bronn & Bronn, 2003: 296) “suggest four co-orientation states: a state of the true consensus, a state of dissensus, a state of false consensus and a state of false conflict. As explained by them, ‘true consensus is when both parties know they share an agreement or evaluation of an issue’. Dissensus occurs when both parties hold conflicting views and they are aware of their differences. A false consensus exists when the organization mistakenly believes the stakeholders hold the same as they do, or that they both agree on an issue. A state of false conflict exists when the parties, the organization and the stakeholder(s), believe they disagree on an issue, policy or action, when in fact they agree”.

Shannon and Weaver (as cited in Bronn & Bronn, 2003: 296) and Dozier and Ehling (as cited in Bronn & Bronn, 2003: 296) theory is consistent with and emphasises the importance of McLeod and Chaffee’s co-orientation model. It is my perspective that in many cases, Eskom has ‘false consensus’ because both parties perceive they understand each other and that they have common goals. Kim (as cited in Bronn & Bronn, 2003: 296) defines a problem as “a formal statement of a set of assumptions about the world”. This is where part of the complexity exists. The variation in assumptions creates the problem, the more significant the variation or interpretation, the more complex and larger the problem and the more ineffective communication will be. Culture, upbringing, beliefs, morals and different values are just some of the factors that influence the way we view or interpret situations.

During times of communication, the ‘mess’ (Table 4.3) increases when no effort is made to understand or discuss the reasoning or assumptions on which interpretations are made.

One of the purposes of communication in these situations is to reach agreement. Hence, a key aspect in most situations is to establish a sufficient degree of agreement and then develop from this point. Based on the continuum concept (Figure 2.13), both parties may be at opposite ends of the spectrum, but somewhere in between the opposing views may converge, and it may just be this aspect that holds the key to understanding each other.

There is a common thread running through all the references quoted in this section – understanding the other stakeholder’s point of view. However, because full disclosure from either party is unlikely there will be a general assumption of uncertainties.

2.2.7.3 Mental models and organisational learning

Definitions

Organisational learning has been described as the “*experience-based improvement in organisational task performance*” (Argyris and Schon as cited in Definitions: *Organisational Learning*. World Wide Web) and as the organisation's autonomous capacity to create, share and use strategic information about itself and its environment for decision making (Shrivastava & Grant as cited in Definitions: *Organisational Learning*. World Wide Web).

Fiol and Lyles (as cited in Definitions: *Organisational Learning*. World Wide Web) refer to organisational learning as “*the process of improving actions by better knowledge and understanding*”. Due to our ever changing environment, it is imperative for organisations to continuously evaluate past and current experiences. What got a company to where it is today, is not adequate to keep it there tomorrow. “*These learning processes occurred either explicitly, as part of a conscious program of change, or implicitly without any obvious guiding managerial influence*”. (Bronn & Bronn, 2003: 298). The fact that no solution exists to the objections to power lines, could imply that Eskom or its relevant departments is not a learning organisation.

Senge (as cited in Bronn & Bronn, 2003: 298) in his book *The Fifth Discipline* “*refers to five learning disciplines that characterize a learning organization; Mental models, team learning, systems thinking, shared vision and personal mastery*”.

Bronn & Bronn (2003: 298) state that *“it is important to recognize that organizational learning is a process and not an end state and that the central discipline is mental models”*

What complicates matters even more is that Bronn & Bronn (2003: 298) imply that there are two types of mental models.

- *“Espoused mental models – are those that people are able to use and explain why they react in a certain manner”.*
- *“Models in use - refer to observed behaviour”.*

Our mental models can prevent us from communicating about our inner feelings so as not to expose ourselves. This is what Argyris (as cited in April, et al., 2003) refers to as *“defensive routines”*. This can make the level of accuracy in interpreting a stakeholders actual mental model, very difficult.

Bronn & Bronn (2003: 299) state that the skills required for effective communications are reflection, inquiry and advocacy.

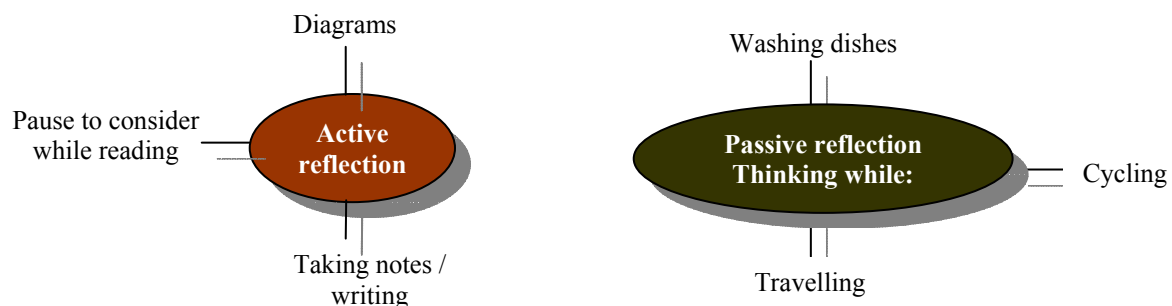
- Reflection is the process of analyzing and interpreting data.

The Open University, T205: WebZone, (2000) course material refers to two types of reflection:

- Active reflection - Diagramming, making visible your thoughts, another form is where you pause to consider the points in an article as you read (The Open University, T205: WebZone, 2000: 230).
- Passive reflection – ‘mulling over’ this can be done while doing leisure activities (The Open University, T205: WebZone, 2000: 230).

“The objective of reflection is to make the practitioner more aware of his or her own thinking and reasoning processes. Reflection is a natural way of connecting with unconscious thoughts and feeling” (The Open University, T205: WebZone, 2000: 227).

Figure 2.8: Active and passive reflection



To achieve mutual understanding, and a high level of accuracy, open and honest two way communication is required. Although the skills are clearly defined, it is easier said than done. This encounter could take place between two strangers, hence, there could be varying degrees of suspicion as to the motives.

- Inquiry - Bronn & Bronn (2003: 299) states that the “*objective of inquiry is to understand the thinking and reasoning process of other stakeholders*”.

The Open University, T205: WebZone, (2000: 230) course material implies that “*Reflection is at the core of all activity in the understanding phase of mess analysis*”.

To my knowledge, and based on the absence of literature pertaining to game ranching and power lines, very little effort has been made to gain knowledge and understanding. If it has, it has not been documented and made available to the public. The aim of this dissertation is to gain knowledge and understanding of the factors causing game ranchers’ actions. Communication and reflection will be key elements in this process (see sections 3.6.2 and 4.3).

The very nature of the understanding phase requires in-depth questioning. One on one interviews are the proposed tool for the data assembly phase. This is covered in more detail in section 3.6.2. Hence, the need to attempt to build some form of trust relationship as soon as possible.

The degree of trust will determine the level of accuracy of the feedback. If the stakeholder is suspicious of the motives of the inquiry, full disclosure is rarely possible and ‘games or theatrical performances’ are likely to be the result.

- Advocacy is the phase of disclosing your own inner feelings. The practitioner’s openness, sensitivity and willingness to share could very well determine the level of response and disclosure from the stakeholder. As mentioned in chapter one, my concern was with the level of trust between myself as an Eskom employee and the game ranchers. The fact that I am not neutral in terms of position could well create the perception that the purpose of the study is to the benefit of Eskom alone. This is clearly not a climate conducive to honest disclosure.

A balance needs to be maintained during the inquiry and advocacy phases. Excess in either one will result in one way communication. Excessive inquiry will result in one way sharing from the stakeholder and excessive advocacy will result in one way communication from the practitioner. At all times, the practitioner needs to have and display genuine empathy for the stakeholder’s perspectives.

2.2.7.4 Organizational implications of the co-orientation model

According to Harrison and St John (as cited in Bronn & Bronn, 2003: 300) *“Stakeholder management includes communicating, negotiating and contracting, managing relationships and motivating them to respond to the organization in ways that benefit it”*.

Typically, this is where ‘boundary people’ can be utilized. The term boundary people refer to employees who interact with the stakeholders. They are able to gather information internally from the organisation and externally from the public. This data should then be directed back to management or to the appropriate people for analysis and understanding, and then decisions taken. This is a continuous cycle that the organisation should encourage to maintain a culture of organisational learning. Typically, surveyors, Technical Service Centre (TSC) members and environmentalists in the Eskom context can be classified as boundary people.

2.2.7.5 Organisational Culture

Organizational Culture is defined as: *“A pattern of basic assumptions – invented and discovered, or developed by a given group as it learns to cope with the problems of external adoption and internal integration – that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems”* (Schein as cited in Ivancevich & Matteson, 2002: 67).

Hall (as cited in Idris, Abdullah, Idris, & Hussain, 2003: 100) explained that *“organizational culture could be fitted into his frameworks of intangible resources. It includes the habits, attitudes, beliefs, and values that bind the individuals and groups together. Such cultures that promote such high quality standards, enhance the ability to react to change and encourage the ability to learn, would lead to a competitive advantage for that organization”*.

2.2.7.6 Organizational learning conclusion

The heart of organisational learning is communication. As has already been discussed in the various phases of inquiry and advocacy, communication is essential.

The importance of communication needs to be elevated to a degree where it becomes an integral part of strategy and organisational culture. Using Eskom as an example, with the number of boundary people involved, this poses a real challenge to implementation.

Because of diverse worldviews and mental models, significant differences and interpretations will make agreement almost impossible. Although agreement is the objective, understanding your stakeholders' views and the reasoning and complexities that influence their decisions will contribute to organisations learning. As Bronn & Bronn (2003: 302) states, *“the role of the corporate communicator becomes, through this process, far more than simply the mouth piece of the firm”*.

2.2.8 Opposing views of Stakeholder Theory

Stakeholder theory has not lacked critics: Argenti (1993), Amber and Wilson (1995) (as cited in Lea, 1999: 153) *“argue that ‘multi-functionary’ policies imposed on business may lead to a confusion of purpose. They point out that the organization may not only become competitively disadvantaged, it may also be unmanageable”*. This could very well apply to Eskom with its many property owner stakeholders.

Sternberg (1997: 4) implies that due to technology and global connections and based on Freeman's definition of a stakeholder just about *“everyone, everything and everywhere”* would be included. Clearly from my perspective, this is not what Stakeholder theory advocates. Based on Sternberg's quote above, it is impractical and unsustainable; hence stakeholders own theory as perceived by some could be its demise.

2.2.8.1 The defects of Stakeholder theory

“Far from being a source of improvements, however, stakeholder theory is fundamentally misguided, incapable of providing better corporate governance, business performance or business conduct. Stakeholder theory is indeed incompatible with all substantive objectives, and undermines both private property and accountability” (Sternberg, 1997: 3).

2.2.8.2 Stakeholder theory is incompatible with business

Amongst other reasons, Sternberg (1997: 4) states that due to stakeholder aim being, *“balancing benefits for all stakeholders – precludes all objectives which favour particular groups”*. The purpose of companies is generally to *“maximize long term owner value”* (Sternberg 1997: 4) hence their objectives are ruled out.

2.2.8.3 Balancing stakeholder objectives is an unworkable objective:

These are summarized issues that Sternberg (1997: 4) raises, suggesting why stakeholder theory is unworkable.

- Balancing stakeholder objectives is an unworkable objective because the number of people affected is infinite (Sternberg 1997: 4). Stakeholder theory offers no clear method of defining a stakeholder, to limit them.
- Defining the benefits is problematic.
- If benefits can be identified, how is the balance struck.

2.2.8.4 Stakeholder Theory is incompatible with corporate governance:

“An organization that is accountable to everyone, is accountable to no one: accountability that is diffuse, is effectively non-existent” (Sternberg 1997: 5).

2.2.8.5 Stakeholder theory of accountability is unjustified

Sternberg (1997: 6) uses the extreme analogy that gravity affects corporations, hence, according to stakeholder theory; they are accountable to this natural force.

Sternberg (1997: 7) essentially implies that external factors will demand that organisations are ethical in their approach. If their behaviour is inappropriate, resistance or conflict will determine the outcome, whether it is by withholding their economic force or by whatever means at their disposal.

Sundaram and Inkpen (2004: 371) seem to argue as many others do regarding the application of stakeholder theory, and go on to say *“if managing on behalf of stakeholders is instead the desired goal, proponents of such a view must go beyond critiques of the shareholder view, to offer a robust alternative theory that is compatible with the naturally occurring incentives, impulses, and imperatives of market and property rights, based economics in democratic/capitalist societies. If such a theory is developed and can be empirically supported we would be the first to welcome it”*.

Gioia (1999: 228) uses the analogy of “*do the right thing*” for business campaigns and is similar to the “*just say no*” (Gioia, 1999: 228) campaign to sex and drugs, implying that the proponents of stakeholder theory who suggested that managers should just “*do the right thing*” (Gioia, 1999: 228) is a far more complex issue due to social, economic and organisation realities facing managers.

As Trevino and Weaves (as cited in Gioia, 1999: 229) state, “*is there such a thing as stakeholder theory*”?

As the favoured saying goes “*get off the veranda – which means armchair theorizing only goes so far and too easily ends up in the clouds*” (Gioia, 2004: 230).

2.2.9 Conclusion

It appears that the Stakeholder Theory debate is far from over. Stakeholder theory and the role of the stakeholders have influenced and caused a once clearly defined idea of an organisation to become a far greater and more encompassing theory of a company with less distinct boundaries.

The purpose of Stakeholder theory is to promote a self sustaining responsibility on companies to contribute positive benefits to individuals or communities. In the Eskom context, sustainability is very important, but just as important is co-operation by stakeholders. Stakeholder theory would generally require a fairly large degree of change in process and in the way companies run and structure their financing. Eskom would not be excluded from this. As discussed in section 2.4.1.2, types of RoW, Eskom’s current method of compensating property owners for sub transmission lines does not quite comply with Stakeholder theory in terms of profit sharing. Hence, changes would need to be made before implementation. Currently, game ranchers receive a once of lump sum payment, but perhaps if this was converted to an annual rental or type of dividend, it may appear more attractive/acceptable to them.

NB. To bear the consequences of a line for approximately 25 years and receive a nominal payment at the beginning does appear to be an injustice.

Unless a company is a ‘learning organisation’ and even if it is, change does not come easily, especially if it means reduced profits. As Cook, Macaulay and Coldicott (2001: 3) state in their book *Change Management Excellence*, “*Leaders during change are like the captain of a ship. They may have a map of the seas they sail and they may know their intended destination but they rely on their compass to navigate a pathway. They must be prepared for all eventualities*”.

My perspective is that stakeholder theory can fulfil a role in society and organisations. However, to implement it will require a paradigm shift and commitment from top management. The practical implications to process the payments at the agreed frequency will require resources, which are currently very limited. A financial model would need to be developed. This will not be a simple task. Clearly this is a complex issue, but if accepted by management and key stakeholders, it could contribute to improving Rights of Way acquisition. However, having said this, the interviews with the selected sample of game ranchers will indicate whether financial compensation is an acceptable substitute for visual intrusion caused by power lines.

2.3 THE NATURAL ENVIRONMENT AS A STAKEHOLDER

2.3.1 Introduction

In stakeholder theory, the term stakeholder generally refers to individuals, groups, or employees who are influenced or can influence the objectives of an organisation. Hence, by pure definition the natural environment is excluded.

Considering the impact people and industry have on the natural environment, i.e. greenhouse gasses, toxic wastes, if things are not managed in a responsible manner, the cost may take billions of rands to rectify. From this point of view, the natural environment is one of the most important stakeholders.

Bucholz (2004: 130) states that *“what is of more major interest here, however, is the impacts that business has on the natural environment (NE) and the implications of these impacts for stakeholder theory. Treating the natural environment as a stakeholder has three aspects: conceptual, ethical and market”*

2.3.2 The Conceptual problem

Technology has allowed mankind, to a large extent, to alter the natural environment to suit itself at the expense of the environment. This has all been done in the name of progress and invariably the underlying driver was profits. An example of this is power lines. Technology has made it possible to transmit electricity over long distances, hence, this linear type impact can be experienced over large areas.

Another example is fences; they are also linear in nature, impacting large areas by interrupting natural animal migration routes. As a result, man now needs to manage the environment in a responsible manner as would any other stakeholder.

Bill McKibben (as cited in Bucholz, 2004: 130) in his book *The End of Nature* “*implies that nature in its pure form as we have known it in the past, no longer exists*”.

2.3.3 The Ethical problem

From a systems perspective, humans and the natural environment cannot be separated. The one influences the other. However, when nature is viewed as an instrument for the gain of humans it is an unhealthy situation. Essentially this implies that if it has “*no inherent or intrinsic value*” (Tyler Miller, 1994: 684), there is possibly no reason to preserve or conserve it. As stated by Bucholz (2004: 131), “*such an approach promotes an unhealthy separation between humans and the rest of nature and leads to policies and practices that undermine the conditions for supporting human life and activities by destroying the natural world on which we all depend for our existence*”.

2.3.4 The Market Problem

Bucholz (2004: 131) states that “*the market does not respond very well to environmental problems if left to its own devices, as it treats the environment as something external to itself*”.

Economic theory is essentially in conflict with nature’s inability to sustain itself when over exploited. Economic theory demands that supply and demand determines prices. Hence, as resources or stock become depleted and scarce, prices escalate, reinforcing the feed back loop, resulting in the remaining stock being eagerly harvested to the point where the positive feedback loop spirals out of control and self destructs. At this point, the reserve is probably beyond its threshold.

Bucholz (2004: 131) further states that “*Market systems evolved to serve human needs and wants; they are not constructed to protect the environment*”

2.3.5 Partnerships (Green Alliances)

Crane (1998: 560) refers to Green Alliance as “*any formal or informal collaboration between two or more organizations which is aimed at developing common solutions to the collaborators environmental problems*”.

Green alliances are formed essentially to further a company’s business interests. These alliances are not only formed between private companies, but also include government organisations and the private sector. The purpose of the alliance could be to utilize the expertise present in the company, or it may be to obtain a larger portion of the market share or because of a company’s excellent reputation, there are benefits for companies involved.

Eskom entered into a partnership with EWT on “*1 April 1996 to manage wildlife interactions in a systematic manner*” (Kruger, 1999: 9).

Figure 2.9: Logo - Endangered Wild Life Trust & Eskom Strategic Partnership



Certainly from a bird protection aspect, huge gains have been made. Devices have been designed and attached to critical parts of power line structures to prevent bird electrocutions etc. Having said that, the support of organisations like EWT is important to Eskom, consequently, some form of Green Alliance has been developed.

My perspective on the issue applicable to this study is far more complex and requires alternative methods to improve the situation. Hence, I don’t believe that these alliances have had any significant influence on alleviating the problems associated with RoW and game ranchers. They have however appeared to have made positive impacts on pressure groups.

Figure 2.10: Three different pieces of equipment designed to limit negative interactions between birds and power lines



2.3.6 Corporate Environmentalism

Environmental Marketing, “*Green or Environmental Marketing consists of all activities designed to generate and facilitate any exchanges intended to satisfy human needs or wants, such that the satisfaction of these needs and wants occurs, with minimal detrimental impact on the natural environment*” (Stanton & Futrell as cited in Polonsky, 1995: 30). This needs to be the view of all organisations and individuals.

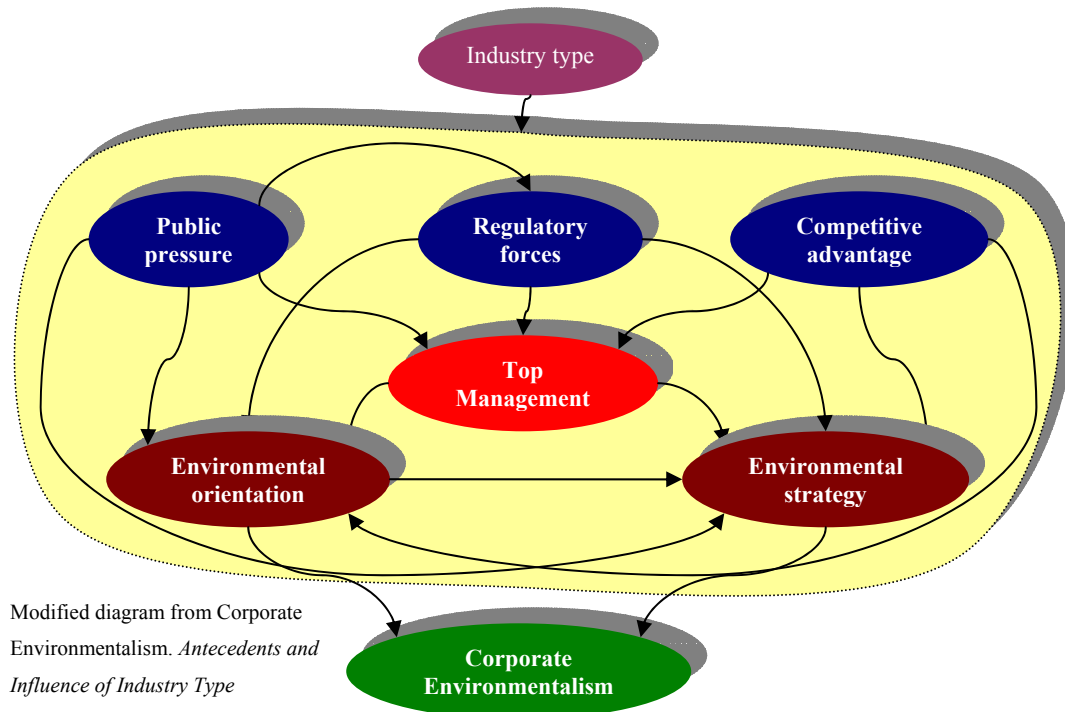
Environmental orientation “*is the recognition by managers of the importance of environmental issues facing their firms*” (Banerjee, Lyer & Kashyap, 2003: 106).

Environmental strategy “*is the extent to which environmental issues are integrated with a firm’s strategic plans*” (Banerjee, Lyer & Kashyap, 2003: 106).

Corporate environmentalism “*is the recognition of the importance of environmental issues facing the firm and the integration of those issues into the firm’s strategic plans*” (Banerjee, Lyer & Kashyap, 2003: 106)

2.3.6.1 Antecedents of Corporate Environmentalism

Banerjee et al., (2003: 107) poses the question, “*what factors lead a firm to embrace environmentalism? Is it a response to regulation or part of a strategy to gain competitive advantage in the marketplace? Is it a reaction to public outcry or part of a proactive business strategy*”? It can be one or it could be all of them, very often it is public outcry that drives the policy makers into formulating specific policies.

Figure 2.11: Antecedents to Corporate Environmentalism: A Conceptual Model

2.3.6.2 Public concern

Frequently public outcry carries more weight than policies. A typical example is badger friendly honey. Certain consumers prefer to buy only badger friendly honey. This in turn affects the retailer who would prefer to be seen supporting environmentally friendly products, which in turn influences the honey producers to gain that share of the market. Although this results in a system with a positive feedback loop, equilibrium will be reached because only a limited quantity of badger friendly honey can be produced, thus preventing it from spiralling out of control.

For stakeholders to be successful in influencing a firm's strategy, they need access to and the attention of top management as implied by Agle, Mitchell, and Sonnenfeld (as cited in Banerjee et al., 2003: 110). This statement is not true in all respects since there are numerous cases where public protests have directed the outcomes of situations, without any contact from top management. In fact, the public participation process required for certain projects can influence company strategy, again without top management contact. However, it would probably be top management who would make the decision if it was feasible to continue with a project based on the demands of society. Hence, I see the public as key external antecedents and top management as key internal antecedents who together might influence corporate environmentalism.

The current situation of game ranchers restricting access to Eskom maintenance teams has resulted in Management involvement as stated by Agle et al., (as cited in Banerjee et al., 2003: 110).

2.3.6.3 Regulatory forces

“Regulators are important stakeholders that exert external political and economic forces on the firm. Environmental regulations and the associated compliance costs vary from industry to industry” (McCrea as cited in Banerjee et al., 2003: 109).

An example of a Regulatory force is the ISO 14001 Environmental Regulation with which Eskom has to comply. Additional Acts that Eskom needs to comply with are listed in section 2.4.4.3

2.3.6.4 Environmental orientation and environmental strategy

“Organizational learning about environmentalism occurs in the collective consciousness of a firm, and over time, the resultant knowledge is fused and internalized within the corporate values and beliefs” (Banerjee et al., 2003: 111). This ties up with the four phases of inquiry, sensing, understanding, deciding, and acting. As the public become more environmentally conscious and uses their buying power to support their views, more and more organisations are realising the importance of Corporate Environmentalism and the competitive advantage frequently associated with it. Eskom does not have competitors in the true sense of the word. There are alternative forms of energy, but not used to a degree that could be considered a threat or competition. However, Eskom is committed and continuously striving to have as minimal an impact on the environment as possible. The fact that power lines are constructed on private and public property and are generally very visible, demands that top management demonstrates its commitment to environmentalism.

2.3.7 Conclusion

Although the Natural Environment does not classify as a stakeholder in terms of the definition in chapter 2.3.1, in my opinion it is a stakeholder. The inability of market systems to respond in an appropriate manner to protect the environment cannot be blamed on them; they were not designed in this manner.

Hence, Governments, business, groups, communities and other stakeholders need to take this into account and treat the natural environment as a true stakeholder. The fact that it cannot represent itself, does not exclude it. On the contrary, we need to be advocates for it. Eskom and game ranchers are not excluded from this responsibility. Power lines and game ranching both have negative impacts on the natural environment. This needs to be considered before accusing others of ignoring environmental issues. April et al., (2003: 11) refers to three sets of skills that will help in these situations:-

- *“Introspection – rather than accusing others, examines how we ourselves may have contributed to the problem”.*
- *“Reflection – stepping back and slowing down thinking processes to become more aware”.*
- *“Inquiry – asking questions to test our assumptions”.*

2.4 RIGHTS OF WAY (RoW)

2.4.1 Introduction

2.4.1.1 Purpose of the RoW

Eskom nationally has well in excess of 100000 kilometres of power lines valued at multi-million rands on private and state property. Added to this, Eskom has committed itself to supply electricity to South Africa. The risk of land owners and Eskom reneging on informal agreements, thus jeopardising the chances of meeting this obligation, is too high. Hence, the need to have some form of secure land tenure is essential.

The purpose of this section is to provide the practitioner/reader with an overview of associated legal and management requirements of RoWs and the implications to the game rancher.

2.4.1.2 Types of RoW

Eskom uses two types of RoW for power lines, wayleave agreements and servitudes as defined below. The former is used for low plus medium voltage and the latter for high voltage lines.

Low voltage is standard domestic use, 220 volts. Medium voltage is between 11000 volts and 33000 volts. High voltage is 44000 volts and higher.

- Wayleave agreement: An unregistered personal servitude, which is generally regarded as being binding on successors in title who have knowledge of the right. Eskom's minor power lines, which are rural and urban reticulation lines, are covered by wayleave agreements. These are not secured by registration in the deeds office. Eskom's security relies largely on the fact that the provision of electricity is or can be made available from these lines. Due to the above, no consideration is paid for these rights because their presence is generally regarded as being an advantage to the property.
- Servitude: A right granted to Eskom and registered or to be registered against the title deed of the land in question; usually involves the payment of consideration.

2.4.1.3 Servitude widths

Table 2.1: Servitude widths

| Guidelines for different voltages and requirements used by Eskom Distribution & Transmission | |
|--|--|
| Voltage | Width of Right of Way from centre line Double the value for total width |
| 1) All voltages below 22kV | 9 metres |
| 2) 22kV | 9 metres |
| 3) 33kV | 11 metres |
| 4) 44kV | 11 metres |
| 5) 66kV | 11 metres |
| 6) 88kV | 11 metres |
| 7) 132kV and Delta construction 275kV | 18 metres (15.5 - 20) |
| 8) 220kV | 23.5 metres (19.5 - 21.0) |
| 9) 275kV (Horizontal) | 23.5 metres |
| 10) 400kV | 27.5 metres (Stayed) (23.5 m Self-supporting) |
| 11) 765kV | 40 metres |

Based on theoretical and practical principles, the servitude width is a function of the following:

A = Horizontal conductor spacing at the structure (Generically a family of structures, e.g. self-supporting monopoles, having roughly the same horizontal spacing between conductors for all types of structures; the standoff insulators are 1.2m long and the strain cross arms about the same.

B = Conductor swing at 500Pa wind (Insulator length and sag must be considered, see Figure 2.12)

C = OHS Act Clearance to buildings, as a minimum, or Eskom requirements which might be more than the OHS Act regulations.

Therefore, required servitude width = $A + 2 \times (B+C)$ (Greyling, Rozmiarek, Naidoo, Branfield & Gaylard, 2003).

2.4.1.4 Consideration

Over a twenty year period of negotiating RoW for power lines, I have repeatedly heard property owners accusing Eskom of using its Utility status to obtain RoW for power lines, implying that Eskom abuses its power and influence in determining the consideration payable. Most property owners complain about the consideration payable, but ultimately accept it, as stated above. Many also complain about the once of payment and feel that a rental agreement or similar financial model should be used for the life cycle of the power line. This option is discussed in chapter 2.2

The current model used for calculating consideration is based on current land value multiplied by the area of the RoW. Consideration = (length of RoW x width of RoW)/10000 x rand per hectare. One of the weaknesses of the financial model for calculating consideration is that it only utilises quantitative factors; qualitative issues are not considered.

Although a rental agreement may appear feasible, it will have huge financial and logistic implications. Eskom's transmission lines traverse thousands of properties nationally. Structures and processes would need to be created to meet this requirement. Payment frequency would need to be limited to an absolute minimum to reduce administration costs.

2.4.1.5 Additional clearances developed to accommodate game ranching

The table below indicates minimum ground clearance. Due to the height of giraffe, additional clearance is required as stipulated by the Occupational Health & Safety Act (OHSA) (Act 85 of 1993).

Electrocutions of giraffes often lead to liability claims against Eskom. Unfortunately, many kilometres of line have been constructed without this additional clearance. This poses a problem, because Eskom will not contribute financially to raising the conductors. This stance annoys game ranchers, and further contributes to the objections to power lines.

Table 2.2: Additional clearances for Giraffe

| System nominal voltage | Minimum Electrical Clearance in mm | Phase to Ground Clearance | Height of Giraffe accepted in mm | Minimum Clearance for Giraffes in mm |
|------------------------|------------------------------------|---------------------------|----------------------------------|--------------------------------------|
| 11 | 200 | 5200 | 5 300 | 5 700 |
| 22 | 320 | 5200 | 5 300 | 5 820 |
| 33 | 430 | 5300 | 5 300 | 5 930 |
| 44 | 540 | 5400 | 5 300 | 6 040 |
| 66 | 770 | 5700 | 5 300 | 6 270 |
| 88 | 1 000 | 5870 | 5 300 | 6 500 |
| 132 | 1 450 | 6320 | 5 300 | 6 950 |

The absence of additional clearance could have been due to various reasons, two which are listed below:

- There was no requirement in the Act at the time.
- There was no knowledge of intention to introduce giraffe.

African elephant and rhinoceros have a habit of rubbing themselves up against power line poles and stay wires, which may cause the pole to collapse or create additional sag in the conductor, thereby reducing the phase to ground clearance. *“Mitigation measures used in the past are the packing of stones at the base of structures or planting short thick “rubbing poles” near structures”* (Greyling et al., 2003: 63). Eskom will construct new lines at its own cost in accordance with the current land use. However, when lines need to be modified due to a transformation from other types of farming to game ranching, the owner is expected to pay.

2.4.2 Rights of Way Management

2.4.2.1 Environmental Management Plan (EMP)

Weedy, B.M. (1989: 224) states that *“the intensive efforts spent in developing an environmentally compatible line route can be jeopardized if a well conceived RoW management program before, during and after the line construction is not developed. A RoW management program consists of the development of guidelines and control procedures to be followed throughout the lifespan of transmission lines for minimizing the impact of construction activities, maintenance activities, and access planning”*

The current practice within Eskom is to develop an Environment Management Plan (EMP) during the Environmental Impacts Assessment phase, and implement it on execution of the construction phase, continuing for the life cycle of the project.

Recent incidences with encounters between dangerous wild animals and maintenance teams prove that the EMP's are not adequate and do not take into account the possible introduction of dangerous animals into formerly stock farming areas.

EMP Backlog

- In some cases, EMP's were based on stock farming practices, but some of these properties have now been converted to game ranching.
- A Generic EMP has been created for sub transmission lines constructed prior to an EMP being a requirement. To customise the generic EMP to lines specific, each Technical Service Centre (TSC) has been tasked to update or revise each EMP to suit each line. Hence making it line specific.

2.4.2.2 Contractual agreements regarding access to properties

As per paragraph 1.1 to 1.3 in the Annexure 'A' from Eskom's *Option to Register Servitude*, the following extract from the said document applies to access.

The owner hereby grants to Eskom for itself, its successors, assigns or licensees:

The servitude/each of the servitudes shall include the following -

- 1.1 the right to erect such structures and works on the property or to erect or lead such conductors, cables or appliances or other equipment on or over the property as may be necessary or convenient in exercising the right of servitude;*
- 1.2 the right to enter and be upon the property at any time in order to construct, erect, operate, use, maintain, repair, re-erect, alter or inspect the structures, works, appliances, conductors or cables on the property or in order to gain access to any adjacent property in the exercise of similar rights;*
- 1.3 the right to use existing roads giving access to the property or roads running across the property and gates on the property and to erect in any fence such gates as may be necessary or convenient to gain access to or egress from the property and to gain access to any power line, telecommunication conductors, cables or accessory equipment;*

Access is granted to Eskom at any time, as well as the use of any access road. However, availability of access has not always been provided. As game ranches are developed, the tendency is to remove or lock existing gates, preventing access to or along the power line. This has been discussed in section 1.2.6.

2.4.2.3 Access road maintenance costs

Indeed, there have been complaints from game ranchers that Eskom uses their access roads, but does not contribute to the maintenance costs. This may be a valid argument, but how would the costs be apportioned. Eskom's use of the roads may be very infrequent, perhaps as little as once per annum. It also needs to be stated that access roads into remote or difficult areas are at times constructed by Eskom for construction purposes, to the benefit of the owner.

2.4.3 Vegetation Management

2.4.3.1 Purpose

Bush clearing is a concern of game ranchers. Depending on the type and density of vegetation affected by a line, the visibility of a cleared corridor can dramatically increase, thus emphasising the existence of a power line that may otherwise have been fairly inconspicuous.

Hence, the purpose of this section is to identify impacts and alternative methods of bush clearing. It has been the practice and policy of Eskom for many years to clear all vegetation within a pre-defined area from the centre line of a power line.

There are various reasons for this:

- Ease of access for construction and maintenance.
- Turn around time in fault detection and rectification.
- Reduce faults caused by vegetation growing into or falling on the line.

To ensure that vegetation may not compromise Eskom's policies regarding the supply of electricity, the following clause is included in the option document.

2.4.3.2 Contractual obligation regarding vegetation management

The owner hereby grants to Eskom for itself, its successors, assigns or licensees:

The servitude/each of the servitudes shall include the following -

- 1.4 the right to remove any trees, bush, material, grass or structures within the restricted area defined in clause 3 hereof and the right to cut or trim any tree in order to comply with the restrictions referred to in clause 3 hereof.*

The above is an extract from the Annexure 'A' which forms part of Eskom's document, *Option to Acquire Servitude*.

2.4.3.3 Visual and environmental impacts of vegetation management

Various techniques have been introduced to limit the impact of vegetation control on the environment and the aesthetics of an area. One of these is directional pruning. This technique is used to influence the direction of growth of a tree's branches. This would not be unlike some of the more purist techniques used in training bonsais to create the desired form or shape of a tree.

Branches growing in the direction of the conductors are removed right up against the stem of the tree, thus limiting the growth in that direction. Directional pruning is one technique already grouped under right of way management systems known as Integrated Vegetation Management (IVM).

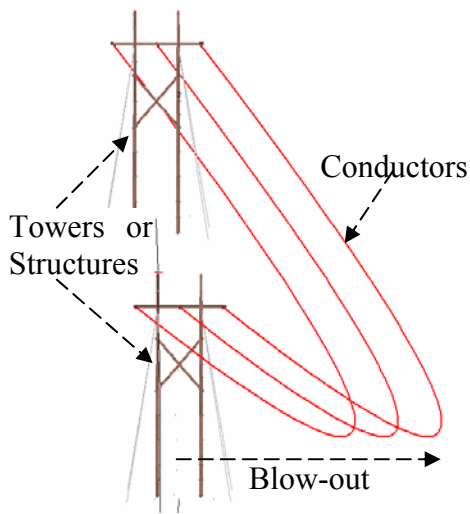
Rubin (1999: 33) states that *“to date, use of the integrated technique has penetrated wilderness area more so than population centres”*. He goes on to state that *“trees trimmed appropriately don't look so great....sparsely populated areas this is not a big problem. But for distribution lines – especially those on private property – this can be a sticky point. Owners worry about their property values”*. He further states that *“an electric utility is a very public entity that runs its business in public space and in the public eye. There is often some element of distrust in the relationship that tend to exacerbate any problems”*.

This is very much in line with what Eskom is experiencing. Directional pruning in rural areas would certainly be more acceptable than removing a tree. However, the longer the span, the greater the swing or arc of the conductor under windy conditions. The term used for this condition, is blow out (Figure 2.12). To accommodate this movement of conductors, could result in most of the top part of the tree being removed. Depending on the span length and wind force, the swing can be in excess of ten meters. Therefore, directional pruning could be implemented in certain conditions where span lengths are limited.

An alternative suggested by Weedy, is *“selective meandering clearing”*.

Weedy (1989: 225) recommends *“selective clearing”* meandering along the RoW with additional clearing at each tower position for tower fabrication. The general policy within Eskom is to manually clear a strip along the centre line, 6m wide along accessible areas and 1m wide through inaccessible areas, e.g. deep valleys.

Figure 2.12: Blow-out: Conductor positions at 500KPa wind conditions, approximately 15m from their still air position.



2.4.3.4 Conclusion

Selective clearing, as suggested by Weedy, would require modification to the existing bush clearing contracts, or the clearing for the fabrication areas would need to be included in the main contract. This activity is executed before the surveying of the ground profile, which is a requirement for the completion of surveying if traditional survey methods are used. Hence, the tower positions would only be determined after the ground profile survey is completed. Bush clearing would then be conducted in two phases, phase one for the survey activity and phase two for the clearing of tower positions. This is possible, but would require additional cost due to second site visit/site establishment and additional costs incurred by the bush clearing contractor.

However, there is indeed merit in selective clearing. The first is visual; an area/strip totally cleared of vegetation is far more visible than an area where selective clearing has been practised. Selective clearing eliminates defined edges, making them far less distinct. The second point is the continued cover for fauna, who find it threatening to venture out into cleared spaces. Scattered vegetation within a so called cleared area may also act as corridors for animals and birds to utilize when crossing from one side to another. A third point is, ground cover would be retained thus eliminating the likelihood of soil erosion.

Furthermore, Rubin's technique of directional pruning would be of limited benefit in many parts of the Eastern Cape where the sub tropical thicket more specifically the Addo thicket grows to an average height of approximately 3 metres. Therefore, this particular vegetation does not pose a danger to the conductors that require a minimum ground to conductor clearance of 5.3 metres at 50° Celsius. However, in valleys and riverine areas where the taller growing valley thicket exists, directional pruning could possibly be implemented under certain circumstances. Personally I would attempt to position the line so as to avoid big trees.

The life time costs of the inconvenience of directional pruning trees and the skill required could prove more of a constraint to maintenance teams than the initial cost of repositioning the line. The question then arises, whether its use is worthwhile? Conductor swing (Figure 2.12) on long spans would render this practice impractical. I see this technique more applicable to urban than rural conditions.

2.4.4 Routing of overhead power lines

2.4.4.1 Purpose and objective

The purpose of route selection is to obtain a route from the source to the delivery point of the power line. The objective is to achieve a life cycle cost effective route with minimal impact on the natural and social environment. However, to achieve this and to satisfy all stakeholders, has become virtually impossible. The objective of this section is to discuss factors influencing route selection and ascertain an international perspective on the subject.

2.4.4.2 Route Selection: Skill or personal perspective and worldviews

My view, it is a combination of all; skill, personal perspective and worldviews. There are various techniques used for route selection, some sophisticated and some based on gut feel (perspectives and worldviews). Request ten different people to select a line route with the same criteria to work from, and over varying topography and fauna and you most likely end up with ten different routes. Each individual has their own thought processes, own perspectives and worldviews and their own prioritised list of factors that influence the routing of a power line.

While one person may rate visual intrusion as a top priority another may rate it as the least important. It is these assumptions coupled with ones experience that are used in decision making. This is one of the reasons why we enter into negotiations with property owners to establish the final route of the power line. Needless to say, this is precisely where the complexity and frustration exists.

“Worldview is about the values you bring to any situation. Perspective is about the insights you bring to a particular situation, based on your own involvement in that situation”. The Open University, T205: WebZone, (2000: 192)

For many years and to a certain degree today, the routing of power lines was based almost exclusively on economic considerations, the straightest / shortest possible route. Past and present were purposely included in the above statement because there has been a change in view over recent years. In all systems, diverse views exist as stated above, and the electricity distribution industry is no exception. To consider opinions for and against the routing and constructing of power lines, especially across game ranches, can be a daunting prospect, for Eskom.

However, using the theory of a continuum (Figure 2.13), with those for and against at opposite ends of the spectrum, in theory there should be common ground, albeit it minimal. The challenge is to discover this commonality and work from there. With this in mind, options are created to work with opposing stakeholders since their involvement cannot be over emphasized.

Figure 2.13: Continuum displaying stakeholders at opposite ends of the spectrum, somewhere there can be common ground



2.4.4.3 Environmental impact assessment process

Definitions

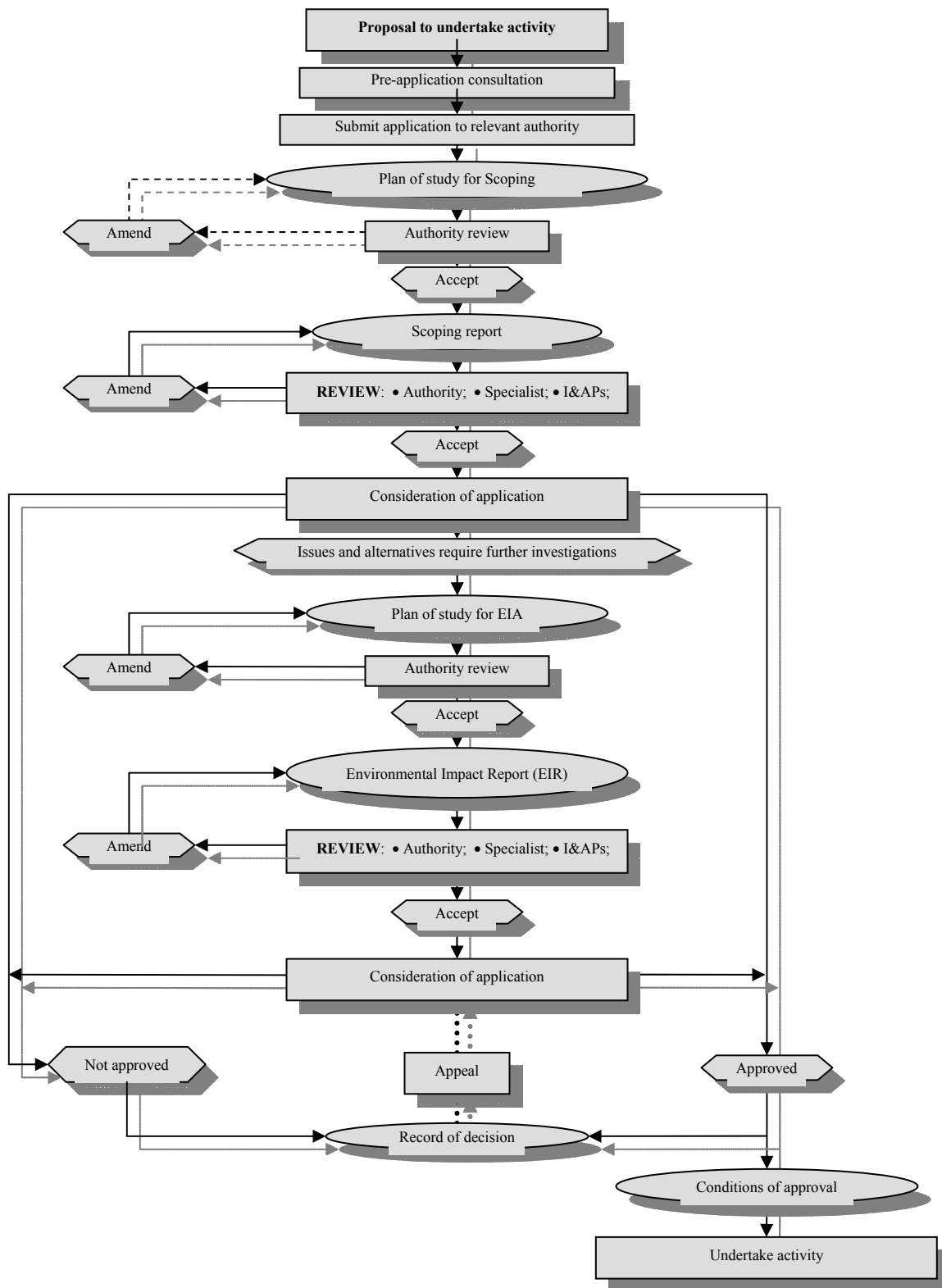
- *“Environmental Management is not about the management of the environment by environmentalists, but rather about the organization controlling its activities that have or could have an impact on the environment”* (Govender, 2004: 3).
- *“Environment means the surroundings within which humans exist”* (Govender, 2004: 3).
- *“Environmental law can be defined as the legal rules involving the conservation of the natural resources of the earth and control of environmental pollution”* (Govender, 2004: 7).

Selection of the Acts applicable to power line projects

Below are some of the acts that are applicable to overhead power lines

- National Environmental management Act (Act 107 of 1998) section 24 (1). As per this act , Eskom is obliged to conduct Environmental Impact Assessments (EIA's) for all projects. It is during this phase of the project that stakeholders have an opportunity to influence the outcome. See Figure 2.14 for process.
- National Forest Act (Act 84 of 1998). This act prohibits the destruction of indigenous trees.
- National Heritage Resources Act (Act 25 of 1999). This act protects our heritage.
- National Water Act (Act 36 of 1998) amongst other issues deals with pollution.
- Fencing Act (Act 31 of 1963) amongst other issues deals with leaving gates open.
- Conservation of Agriculture Resources Act (Act 43 of 1983) amongst other issues deals with spreading of weeds.
- Game Theft Act (Act 105 of 1991) amongst other issues deals with ownership of escaped game.
- National Veld and Forest Fire Act (Act 101 of 1998)

Figure 2.14: Environmental Impact Assessment process



2.4.4.4 Visual

In open flat terrain, concealing a power line is impossible; however, the type of tower used can contribute to reducing the visual intrusion. Figure 2.18 indicating monopoles, typical examples of the development of less visible towers. The monopoles, compared to other towers, are far less visible. The poor quality of the images does tend to exaggerate the effectiveness of the monopoles. However, the comparison is the aim of the images. In undulating terrain, the possibility of reducing visibility of sections of the line are increased. However, there are conflicting views regarding the most suitable position.

- Positioning a power line on level ground on a ridge, it is then visible against the sky line.
- Position it on the slopes, and then access and soil erosion could be problematic.
- Valley floors generally contain indigenous vegetation.

Of the three options, the first one has the least impact on the natural environment, but probably the greatest on visual intrusion. The second and third options have the potential to reduce the visibility of a line. However, the tracks created by construction vehicles can alter the natural flow patterns of rain water over the ground that have existed for centuries, impacting on the natural environment. Similarly, a line routed through vegetation can be less conspicuous, but will have far greater impact on the natural environment. In fact, a strip cleared of vegetation can be far more visible than the power line. These are just some of the decisions that need to be made, as to whether the uninterrupted sky line views are preferred at the expense of the natural environment.

2.4.4.5 Routing – Using the natural vegetation as a shield

Many kilometres of overhead lines in the exotic plantation in the Eastern Cape are not visible due to the trees shielding them. The disadvantage of this is that a large number of outages are caused by trees and branches falling on the lines. Reason (1994: 36) refers to a similar circumstance, *“today, approximately 90 miles of overhead transmission line, operating @ 50 and 69 kV, traverse the Yellowstone national Park. These lines were installed by Montana Power Co (MPC) and intentionally routed through forested areas to shield them from view”*.

Indeed this may be a solution in South Africa where exotic trees exist as mentioned above.

However, where indigenous trees exist, this would not be acceptable.

Firstly, the likelihood of the Department of Environmental Affairs and Tourism approving the clearing of protected trees is very unlikely. Secondly, the mature height of a large percentage of the trees or vegetated areas encountered in the Eastern Cape, is below the height of overhead line structures.

2.4.4.6 International perspective of Route Selection

Weedy (1989: 219) in environmental aspects of route selection for overhead lines in the USA, refers to 3 methodologies for determining alternative power line corridors.

- *“The overlay method...by thus superimposing transparent maps (representing significant factors) on each, a composite map represents areas most favourable and a suitable, least adverse corridor can thus be delineated”* (Weedy, 1989: 219).

- *“Impact assessment models rely to a great extent on the knowledge, judgment and experience of parties involved in their construction”*

For this reason such models could be subjective as perspectives and worldviews on the environment vary (Weedy, 1989: 219).

- *“Networks analysis approach, each of the alternative corridors is defined by links and nodes. Data for each of the links of the networks are collected for comprehensive analysis”* (Weedy, 1989: 220).

Typical data collected per link is *“number of roads affected by the line and volume of traffic”* (Weedy, 1989: 220). The number of streams, rivers, features and land use etc, each have to be evaluated independently for visual impact, distance from features and area of impact. Construction cost per link is also included. By weighing objectives and assigning values to links, a form of multi criteria analysis is used to determine suitable routes.

The objective of the three methods is to minimize the impact to the environment, and if correctly executed will achieve their goal. However, visual intrusion appears to be the most critical factor contributing to resistance to power lines. To place a power line where it will not have visual intrusion is absolutely impossible. Hence, all efforts to minimize the impact to the natural environment is not enough for most game ranches. It is clear that although quantitative analysis, is the dominant factor in many feasibility studies, qualitative analysis is an integral part of the feasibility study and cannot be ignored if a comprehensive evaluation is required.

2.4.4.7 Direct route versus alternative longer routes – International perspective

Generally, when selecting proposed power line routes, sensitive areas are avoided due to the negative impact on the environment or the potential risk of opposition from stakeholders, thus delaying the project.

A Project, Delta – Stinson's Crossing 115kV power line construction in 1995-1996 crossed the Snohomish River, three sloughs and a dozen wetlands.

Koch (1996: 29) states that "*alternative routes were several miles longer and significantly more expensive to build*"

Depending on the circumstances, the use of specialized equipment, advanced technology and thorough environmental impact assessments, sensitive areas can be traversed with overhead power lines.

The article does not mention anything about aesthetics or visual intrusion, which is surprising, because it appears to be the most unacceptable aspect of power lines. Possibly it was not in a highly visible area. He does state that "*some areas of the preferred route were not reachable by road or river barge ...in fact, six of the caissons were located in areas where road building was simply out of the question*" (Koch, 1996: 29). However, the fact remains that the more direct route across sensitive areas can be cost effective and environmentally acceptable.

2.4.4.8 Transmission line intersects rain forest – International perspective

Electrical utilities across the globe are continuously challenged in the construction of overhead power lines. A 68km 278kV power line built in Queensland, Australia, traversed two diverse and fragile ecosystems, World Heritage listed Wet Tropics Rain Forest and the Trinity Inlet estuarine area. The 16km section of line through the rain forest, where possible, was routed alongside an existing 132kV power line to reduce environmental impact. The primary aim in the design of the power line was to limit environmental damage taking cognisance of local conditions.

"the company also adopted construction techniques that minimized the need for heavy vehicle and crane access to structure sites" (Bartlett, 1999: 42). *"The 75m (250ft) towers, which are more than double the height of the existing towers, were designed to enable the conductors to be strung above the 40m (130ft) rainforest canopy....A helicopter landing platform was incorporated into the tower design to permit access from the air for maintenance, avoiding the*

need to maintain ground access tracks” (Bartlett 1999: 44). To limit damage to the mangrove wet lands, temporary access bridges were constructed for personnel and machinery access. The cost of the line through the rainforest and mangrove wetlands was up to three times more than a comparable open area. However, the utility accepted this as an essential cost.

2.4.4.9 Researcher’s perspective of 2.4.4.7 and 2.4.4.8

Above are examples of power lines traversing extremely sensitive areas. The focus in both cases was impact to the environment. This is encouraging. No mention is made of visual intrusion. The idea of out of sight out of mind is a concern. So much emphasis is placed on visual intrusion (see Table 2.3), sometimes at the expense of the natural environment. Non-consumptive ecotourism is structured around the game viewing experience. Therefore, no matter where a power line is routed, the very nature of game viewing demands that tourists need to cover ground in search of animals, resulting in them being exposed to power lines. Hence, any amount of effort will not eliminate the visual intrusion of power lines completely.

2.4.4.10 Negotiation process, areas of control and influences

Definitions:

“Negotiation is a process of interaction between parties directed at reaching some form of agreement that will hold and that is based upon common interests; with the purpose of resolving conflict, despite widely dividing differences. This is achieved basically through the establishment of common ground and the creation of alternatives. To the present authors, common ground is not just what people have in common but what they could become together”. (Pienaar & Spoelstra, 1991: 3).

“Bargaining is an agreement on terms of sale or other transaction, this seen from buyer’s viewpoint” (The South African Pocket Oxford Dictionary)

Negotiations can be classified into three types *“Integrative (win – win), Distributive (win – lose) and Destructive (lose – lose)”* (Pienaar & Spoelstra, 1991: 8-10). In the Eskom context we fall into the category of distributive because Eskom gains without any significant benefit to the property owner. Participants to the negotiation usually have a real and aspiration base, the overlap is known as the negotiation range, the area to target on the continuum line.

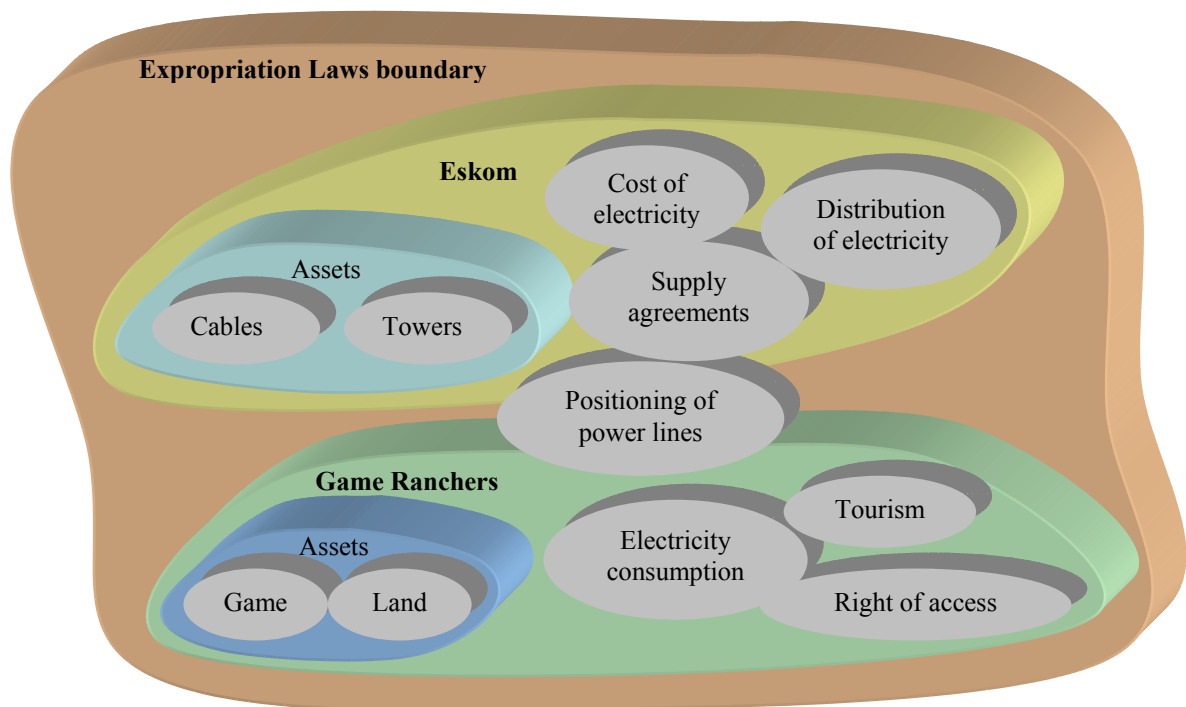
Regrettably, the emphasis tends to be on the signing of the document with whatever means possible, forgetting that a long term important relationship is being initiated. A disgruntled property owner, who feels he was coerced into signing, can be very problematic during the power line's life cycle.

With the negotiation process in mind, to increase my understanding and analysis of the situation I have created a systems map and an influence diagram. These diagrams are based on my own perspectives at this point of the research. To transfer electricity from one point to another and still be affordable, requires the following essential items:-

- Power line:
 - Cables the medium used to transfer the electricity.
 - Towers or structures the supports required to suspend the cables above ground to maintain safety clearances.
- Land on which to build the power line.

2.4.4.11 Boundaries and control (Systems Theory)

Figure 2.15: Systems Map indicating areas of control in the electricity & game ranching systems

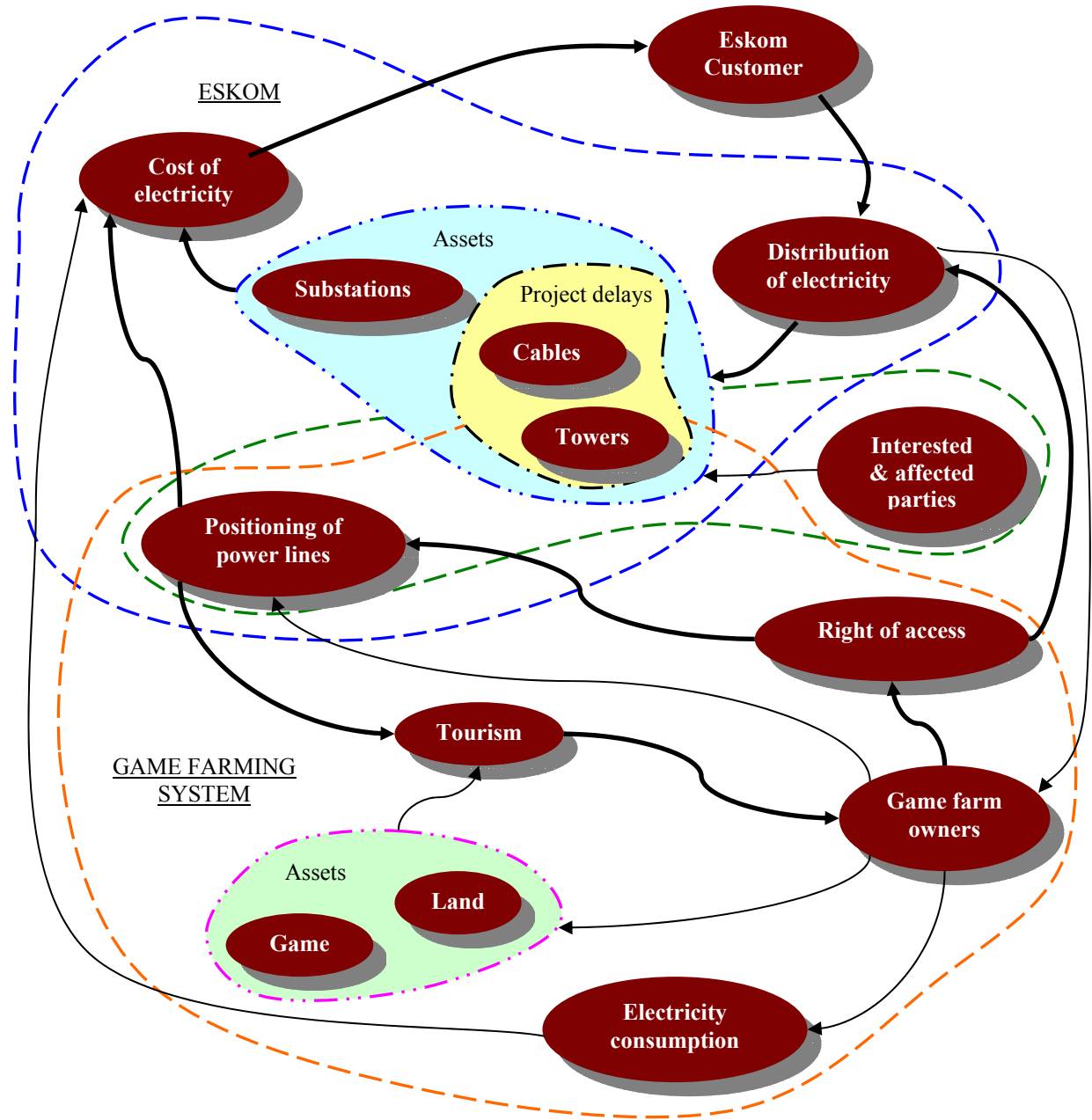


The systems map Figure 2.15, in its final state, indicates the areas of control within each system and what is in their environment. Of the two components and sub components required for transferring electricity, two are under the control of Eskom, and one under the control of the game rancher, which immediately creates a dependency on the game rancher for rights of way for construction of the power line. The influence diagram (Figure 2.16) essentially supports the emergence from the system map (Figure 2.15) ‘Areas of control’. The areas of control are the areas where the two parties have most influence. Once again, I am focusing on the three main components mentioned earlier.

There is, however, a difference in that the game rancher has the greatest influence over the progress (see Figure 2.17) of the project, because without rights the line cannot be built. From Eskom’s perspective, Eskom may have control of generating electricity and owning the equipment e.g. cables and support, but in terms of influence over what type of support should be used, much depends on the outcome of the EIA, of which the game rancher is a key stakeholder and has an influence.

The EIA process relies heavily on public participation. This is a shift from power to empowerment; influence is negotiable, causal is not. This participation allows for multi-perspectives, subsequently avoiding traps caused by single perspectives. This is where power (visible and invisible), conflict and games emerge. Game ranchers may unite (Table 4.4 and Figure 2.17) for a common cause, and may form temporary alliances with other groups.

Figure 2.16: Influence Diagram indicating areas of influence in the electricity & game ranching systems



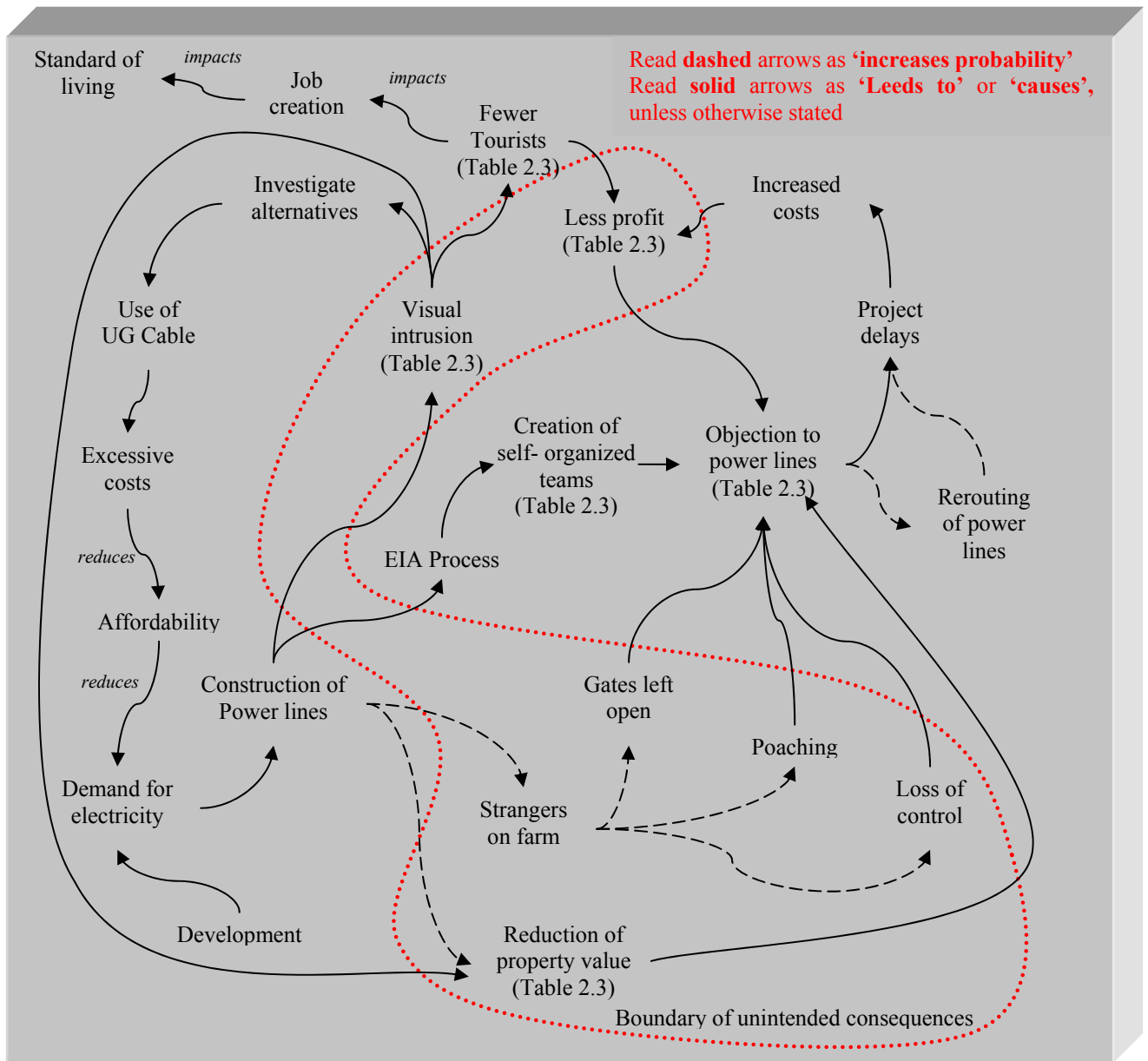
2.4.5 Security

No literature, associated with power lines and their influence on security, could be sourced.

2.5 VISUAL INTRUSION: POWER LINE DESIGN AND PROPERTY VALUES

2.5.1 Aesthetics and power line design

Figure 2.17: Multiple cause Diagram indicating causes and effects with regards to power lines on game ranches (see Table 2.3)



2.5.2 Purpose and Trigger

Construction of power lines is driven by a demand for electricity or because of the replacement of existing lines that have come to the end of their life cycle. As demand increases, and the current networks approach capacity, new lines are planned.

2.5.3 Tower design

As mentioned in section 2.4.4.10, there are three critical components required to transmit electricity: Conductors, structures or towers as well as the land on which to construct the line.

The first two components are to a large degree in the control of the engineers. Hence, *“traditionally the objective of transmission line engineers has been to design the most economic line with acceptable reliability and safety levels”* (Nieminen & Seppa, 1996: 36)

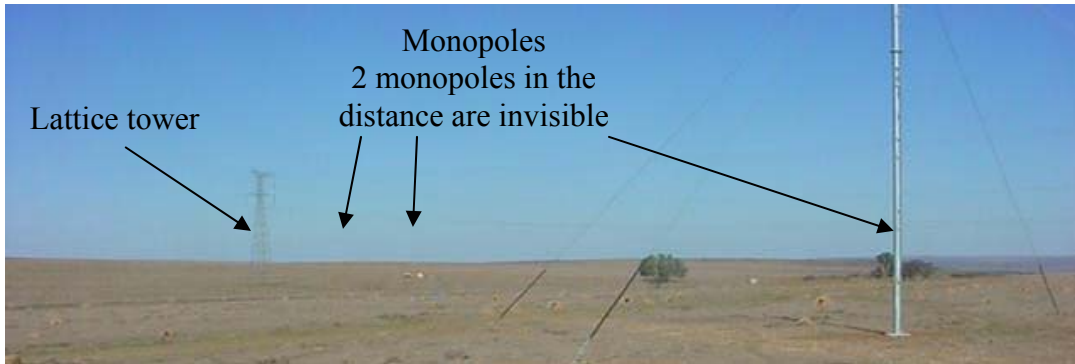
Of the two components, the tower has the greatest visual impact and on which design engineers focus their attention in terms of design to limit costs. This has resulted in the development of *“the traditional self supporting lattice transmission structure, because of its detailed engineering design, makes the most efficient use of material for any structure of comparable size and strength. This means that a lattice structure is light in weight and can be erected without the need for heavy equipment or access roads”* (Reason, 1992: 31). However, contractors may decide to take a risk and offset costs of building access roads, which will speed up the excavation, foundation and fabrication process, against time and costs taken to do the said tasks manually (J Lim 2005, pers. comm., 5 July).

However, due to the design costs of lattice towers and logistics, utilities generally have a limited selection of tower types. The most appropriate series or a combination may be selected for a particular line. *“As a result, they may be larger and stronger than necessary for the span they support – sacrificing some of the inherent benefits of the lattice design”* (Reason, 1992: 31).

As the public have become more aware of their rights and have begun to participate in decision making regarding issues in the public domain, they have used stakeholder interventions as a platform to collectively express their disapproval of power lines (Table 2.3).

Nieminen and Seppa (1996: 36) states that, “*the general public often consider these lines to be eyesores thus increasing their opposition to new construction*”.

Figure 2.18: Image of Monopoles and Lattice Tower



This resistance began to influence the design of towers, resulting in alternative designs. The considerations for tower design moved essentially from quantitative to qualitative. Visual intrusion, environmental considerations, confined areas and land use are factors amongst, others that influence and in some cases, may dictate the type of structure to be used. Confined areas such as urban or densely populated areas, requires a compact configuration i.e. Delta or vertical. Regrettably, compact configuration towers, by their very nature, require them to be taller than horizontal configurations, which could make them more visible in certain circumstances.

Two alternative designs are the cross rope suspension and guyed monopole towers.

“Tubular-steel transmission structures were first introduced in the early 1970’s, in urban and heavily populated areas where the appearance of lattice structures and the RoW width they demanded were just unacceptable to local residents. At about the time members of the public and many groups impacted by transmission line construction were discovering and exercising their power in the public permitting process” (Reason, 1992: 36).

Reason (1992: 36) states that *“tubular steel structures are among the most expensive in terms of installed cost”*. He does not indicate precisely with which towers he is comparing. However, in Eskom, Southern Region experience, excluding wood pole structures the, guyed monopole is the most economical, but would depend on topography.

Because of its recent introduction as a transmission line structure in Eskom Southern Region, life cycle costs are not available for comparison.

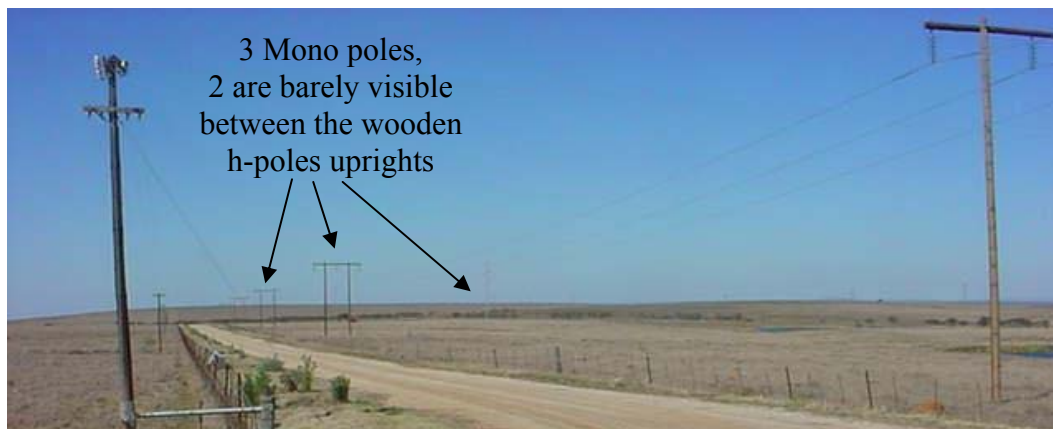
Figure 2.19: Image of Monopole against Sky line



Essentially two types of wood pole transmission structures are used in the Eastern Cape, the H – Pole used mainly for 66kV lines and the 5 pole used mainly for 132kV lines. In South Africa, disposing of wood poles has no defined process or laws. However, Reason states that “*recently, a new unknown was introduced into the life cycle cost equation, when it was suggested that some treated poles may one day need to be disposed of as hazardous waste*” (Reason, 1992: 44). The product in question is a penta chlorophent (PCP).

2.5.4 Visibility: Steel monopole vs. Multiple wood pole structures

Figure 2.20: Image of Monopoles and Wooden H-Poles



The images in Figure 2.18 & Figure 2.20 indicate the inconspicuous nature of the steel mono pole. The direction taken of the image in Figure 2.20 was carefully selected so that the monopoles were positioned between the uprights of the h-pole structure to emphasise the visibility or non-visibility of the structures. Although wooden pole structures are at times the preferred choice by certain stakeholders (because they are a natural product), the images clearly indicate the darker the structure, the more visible they are.

Stakeholders repeatedly request that Eskom lay under ground cable in place of overhead power lines. However, the cost of underground cable would make the cost of electricity unaffordable. Nieminen and Seppa state that the cost of underground cabling is between seven and twenty times more than overhead lines.

2.5.4.1 Transmission vs. rural line

From my experience, there appears to be more resistance to transmission lines than distribution lines. It almost appears that game ranchers do not see a transmission line as having any benefit to them as compared to a distribution line that supplies their electricity. This is supported by Nieminen and Seppa (1996: 36) who states that “*a transmission line is perceived as an unnecessary intrusion within their environment...the trend towards decreased acceptance of transmission lines is universal*”.

2.5.5 Residential Properties Values

2.5.5.1 Introduction

The objective of this section is to review case studies on the impact of power lines on property values, because this is cited by property owners (Table 2.3) as one of the reasons for objecting to power lines. I have purposely not gone into detail regarding the methods used for determining the impact of lines on property values because the literature applies exclusively to residential properties adjacent to or in the immediate vicinity of power lines. Therefore, the weakness of this literature is that it is applicable to residential properties and not game ranches. However, depending on factors that may or may not impact property values, will determine the significance of the literature. For example, if aesthetics or RoW are factors that impact property values then I assume that because these factors are common for rural lines they may have a similar impact on game ranch valuations. If on the other hand, the factors are safety, health and noise, the impact should be very limited as, generally, lines are positioned well away from farmsteads, excluding the line supplying power to the farmstead.

2.5.5.2 Case studies

As indicated in the following paragraph, the question is whether there are genuine factors that reduce property values or whether people's perspectives and worldviews influence their thought processes.

Mandy and Parchin (as cited in McDonough 2003: 25) "*report that a nuisance factor or some source of stigma are factors that may reduce values. They continue to say that the perceived undesirability of a source of stigma*" can contribute to developing a property. In the same vein, Faber (as cited in McDonough 2003: 25) "*explains that, perceived risks are a function of subjective risk factors as well as statistical risks, whether the source of the perceptions is quantitative or subjective, the effects on property value are the same*".

Reduced control has been mentioned as a possible factor for game ranchers objecting to power lines. Once they have a power line servitude registered against the title deed of their property, they feel they have lost a certain degree of control. Kung and Seagle (1992: 413) state that "*adverse conditions adjacent to property that is beyond a homeowners' control can and do affect property values*". Typical examples could be waste disposal sites, factories and power lines etc. lack of control in your environment appears to be a key factor. This is understandable. To invest money into a property with factors that the public consider undesirable, indeed increases the risk to the investment.

Hamilton and Schwann (1995: 443) used many different variables in their research, the primary focus being visual impact. The outcome of their study proved that a narrow band of properties adjacent to power lines devalue by approximately 6,3%, diminishing as the distance increases from the line.

As with the previous literature, Rosier's (2002) conclusions are similar to the rest, that there is a reduction of property values adjacent to power lines. Colwell (1990) endorses the outcomes of the above conclusions. However, he does suggest that over time, the impact does diminish to a limited degree as trees, etc begin to obscure towers etc.

2.5.5.3 Summary

The literature clearly indicates that power lines do have a negative impact on properties. However, as already stated, there is a vast difference between a residential property and a game ranch. Clearly, the outcome of these studies revealed that properties directly adjacent to the line were most affected. In most cases, safety and health were contributing factors, which in the rural situation could have a zero impact. Therefore, my conclusion at this point is that if power lines do have a negative impact on game ranch values, the factors will most likely be different to these applicable to residential properties. The common ones could be RoW (third party agreements) and visual. See Table 2.3

2.5.6 Stakeholders responses to Proposed Eros Grassridge 400kV power line

Below are extracts from *Comments and Response Report* (Eskom, 2004) to the proposed Eros Neptune Grassridge 400kV power line:

http://www.eskom.co.za/eia/Enviro%20assessments/Eros-Neptune-Grassridge/Appendices/Appendix_B.pdf

Table 2.3: Game ranchers comments from public participation meeting held for the proposed Eros Grassridge 400kV line.

| | |
|-------------------------------|--|
| Alexandria Public Open Day | <p>The Addo National Park extension that is going through also poses a lot of problems to the farmers.</p> <p>Pam Golding is selling reserves in the Port Elizabeth to East London area. It is a growing eco-tourism industry. A powerline has an enormous impact on property. If a property has powerlines on it, an agent overseas will not sell that property. The area between Grahamstown and Colchester has so much potential. Even if some landowners have not yet moved into eco-tourism, the potential of considering eco-tourism will be lost because of the transmission line. What is Eskom saying regarding the potential of the area? Loss in potential before and after</p> |
|-------------------------------|--|

| | |
|---|---|
| | <p>valuation of the land. Is Eskom going to look at it?</p> <p>Eco-tourism representatives do not want the powerline in the area because of the same reasons that have been stated by the SANParks.</p> |
| Mr William van Duyn “Dynprop” Amakhala Game Reserve | <p>If such a powerline would pass through a game reserve, it would severely impact on the aesthetics of the reserve. No agents would then sell the reserve and the owners would suffer subsequently. So he would not only lose on the value of his land but all future income from our reserve, Amakhala Game Reserve. We have also spent hundreds of thousands of rands burying powerlines.</p> |
| Mr John O’Brien Shamwari Game Reserve | <p>The proposed routes/corridor goes right through the heart of the eco-tourism development in the Eastern Cape. All proposed routes go through game reserves.</p> <p>The financial impact of the proposed line on the emerging wildlife and tourism industry.</p> |
| Mr Gregg Rippon Pam Golding Properties | <p>The Grahamstown area is going to be the hub of the game industry, in both ecotourism and hunting. Already there are cases where buyers are including as a written condition in a sale that if a powerline comes through a certain farm then the sale is off. This amounts to huge devaluations in ground prices that could be avoided if the powerlines were diverted through less valuable or already existing servitudes.</p> |
| Mr Russell Lovemore Handfield Farm | <p>There are a huge number of game farms in this area, which attract a lot of foreign tourists. It would be a shame to have huge powerlines traversing this land and creating an eye-sore for these tourists.</p> |
| Mr Brad Fike EC Nature Conservation - Great Fish River Reserve | <p>Developmental plans, including privatisation of tourist camps intend to make this area one of the prime conservation/tourism destinations in the Eastern Cape. For aesthetic as well as management reasons (e.g. use of helicopters for capture and management) any overhead transmission lines are hazardous and aesthetically unacceptable due to visibility, clearing of vegetation, scanning of countryside and disturbance by erection and maintenance teams.</p> |

| | |
|---|--|
| <p>Dr William Fowlds Amakhala Game Reserve</p> | <p>I am strongly opposed to such a powerline or any further corridor as long as it has any impact whatsoever (potential or otherwise) on the eco-tourism industry of this area.</p> <p>The following issues must be addressed:</p> <ul style="list-style-type: none"> - Suitable route. - Adverse impact on game reserves that rely on tourism. - Adverse impact on the wild game whilst construction takes place. - The cost of game relocation as such a line cannot be allowed to traverse any game resources. - The loss of tourism to this immediate area with a R4 Billion turn-over per annum. |
| <p>Mr Andre Danckwerts Stormberg Elangeni Safaris</p> | <p>Who will be liable for loss of income due to direct disturbance caused on my private property by the construction of such a line, a line which will benefit this region in no way at all? No one can hunt, site see or take photographs when big machinery, lots of people and lots of noise is taking place.</p> |
| <p>Mr Mark Galpin Kwandwe Private Game Reserve</p> | <p>From an eco-tourism perspective Kwandwe Private Game Reserve would like the line rerouted along alternative B due to the economic impact, posed by the visual intrusion of the line, on our business.</p> <p>How does Eskom measure visual intrusion on landscape? Visual intrusion has an economic impact.</p> |
| <p>Mr Norton Thompson Glen Roy, Komga</p> | <p>Difficult terrain – Helicopters cause disturbance to game. Many of the animals that are present on the game farm were originally captured using a helicopter to herd them prior to being relocated to his farm. As such they are particularly sensitive to the noise of a helicopter. This can pose both danger to the animals, and problems with regard to game viewing for guests at the game farm. This issue refers to both the construction and operational phases of the project.</p> |

2.5.7 Unnatural objects other than power lines

However, a farm road winding up the side of a hillside or down a valley has just as much impact on the aesthetics. In fact, a farm road can change the natural pattern of flow of rain water that has developed over centuries, changing the dynamics of the surroundings with disastrous unintended consequences. A fence line and the associated clearing of vegetation also have an impact on the aesthetics and on the free movement of game. Yet, these are considered necessary and not an issue.

Do people subconsciously notice what is not of direct benefit to them and exclude what is convenient, i.e. a game drive is far more convenient than walking because more ground is covered in a shorter space of time, thus increasing the chance of seeing more game. This satisfies the tourist, who in turn promotes the game ranch, resulting in more tourists, more profit and so the positive feedback loop is reinforced, which justifies the access road, which is a visual intrusion. However, the power line in the middle of nowhere is regarded as an intrusion. This is where the complexity lies, deep in subconscious minds analytical processes are sending messages based on worldviews, but the causes cannot be identified – complex issues. This demands further investigation.

3 RESEARCH DESIGN & METHODOLOGY

'Systems methodologies are attempts to set out principles of methods for systems researchers to follow when setting out to learn from the real world' (Jackson, 1993).

3.1 INTRODUCTION

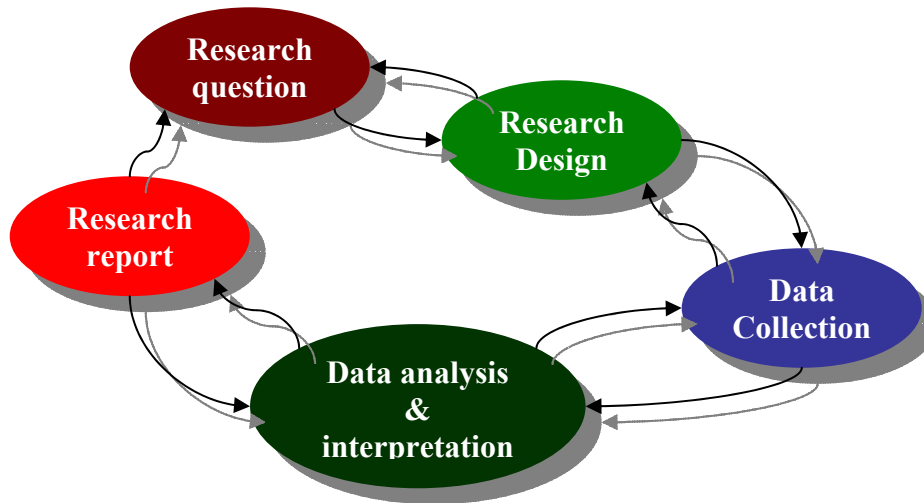
The over arching assumption is that power lines do have negative impacts on the natural environment, which in turn impacts other systems or sub system connected to it.

From a human perspective, this is a very complex issue. There are *"many possible factors and courses of action and many possible interpretations of the situation"* (Lucket, 2004: 7). Of the two types of complexity: hard and soft complexity, it falls squarely in the category of the latter. Hard complexity generally has clearly defined solutions and measurable indicators. The assumptions are part of a nominated or *"explanatory system"* (Lucket, 2004: 5) because they exist in the minds of people. This is the way people perceive or interpret the situation for their own concerns, hence, the need to use Soft Systems and Interpretative Action Research approaches for this research. This is discussed in detail in section 3.5.

My research design will be the theoretical framework linking the research question and the execution of the research. The instruments will be the vehicle to fulfill the purpose of the research. As in project management terms, this is the project plan. A project plan is compiled based on the scope of the project, similarly the *"research design must be developed in accordance with scientific principles"* (TerreBlanche & Durrheim, 1999: 31).

One thing we can be sure of in a project plan, it will most likely change and be revised as the project progresses. The research design is no different, being qualitative; it can be an *"iterative process"* (TerreBlanche & Durrheim, 1999: 31) adapting as the research demands indicate in Figure 3.1.

However, modifications to the research design must not be based on bias in order to influence the outcome. The iterative process demands that the researcher *"continuously reflects"* (TerreBlanche & Durrheim, 1999: 33) and refines the research design during the execution stage.

Figure 3.1: The research process

3.2 ASSUMPTIONS

The following are assumptions generally cited by game ranchers regarding power lines:

- Visual intrusion or aesthetical impact has a negative effect on tourism.
- Properties are devalued and less marketable.
- Security (control is compromised due to third party agreements:- RoW)

The following are my assumptions regarding power lines:

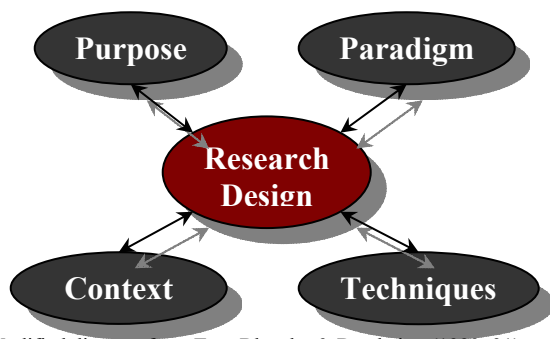
- Their properties could be devalued in certain circumstances.
- Power lines generally will not have a negative effect on tourism/income.
- Right of Way is a nuisance factor that has to a very limited degree, the potential to reduce their control over their property.

3.3 PRINCIPLES OF THE RESEARCH DESIGN

TerreBlanche & Durrheim (1999: 33) states that a series of decisions is required by the researcher, based on four dimensions indicated in Figure 3.3.

- *Purpose of the research*
- *Theoretical paradigm informing the research*
- *Context in which the research is carried out*
- *Research techniques employed to collect and analyse data*

Figure 3.3 Four dimensions of design decisions



Modified diagram from TerreBlanche & Durrheim, (1999: 31)

Linking the research question to the execution of the research demands a process of reflection on issues relevant to these four dimensions guided by two principles of decision making: design validity and design coherence (TerreBlanche & Durrheim, 1999: 33).

3.4 PURPOSE

The purpose is to facilitate learning of a “*problematic situation*” (Lucket, 2004: 11) without clearly defined values and where the purpose is decided by stakeholders and their interpretation of the nature of the system (Lucket, 2004: 1). Therefore the learning process will make use of systems techniques (conceptual models) applicable to the situation. Executed in a manner of inquiry, that will encourage assumption surfacing, and enabling a high degree of accuracy of the data. The units of analysis will be individual game ranchers (dependent variable). Only one property in terms of orientation will be a requirement, either the owner or a delegated employee by the owner/share holders. The purpose is to capture their perspectives and worldviews (independent variable). Soft systems techniques and interpretive research will be used to collect qualitative data. The research process will be dynamic in the sense that it is conducted in real time with real people in real situations and will unfold naturally, without any exclusion of variables, providing a holistic view. As systems theory states, the whole is greater than the sum of the parts. This demands a qualitative approach.

3.5 PARADIGMS (WORLDVIEWS)

Sociological Paradigms

“Systems methodologies....are attempts to set out principles of methods for systems researchers to follow when setting out to learn from the real world” (Jackson, 1993: 17). As with most principles they have certain assumptions about social sciences which can be “*objective or subjective*” (Jackson, 1993: 17).

Theory underpinning objective assumptions will “*perceive social reality*” as having an “*objective existence, external to the individual (‘realist’ ontology)*” (Jackson, 1993: 17). External circumstances will influence an individual’s behaviour. Quantitative analyses would be the preferred technique for detailed knowledge. On the other hand, theory underpinning subjective assumptions will perceive social reality as having a “*subjective existence is the product of the individual / and or shared consciousness (‘nominalist’ ontology)*” (Jackson, 1993: 17). This theory will gain knowledge by closely observing and communicating with human beings to understand their perspectives and worldviews. In turn, assumptions on the nature of society can be seen as emphasizing “*regulation and radical change*” (Jackson, 1993: 19). Combining the objective-subjective and regulation-radical change dimensions creates Burrell and Morgan’s (as cited in Jackson, 1993: 20) a matrix of Four Paradigms (Figure 3.4) for the analysis of Social Theory.

Figure 3.4: Burrell and Morgan's Four Paradigms for the analysis of social theory (as cited in Jackson, 1993: 20).

| | | | | | |
|--|---------------------|---------------------------------|---|--|--|
| | | The sociology of radical change | | | |
| S u b j e c t i v e | Radical Humanism | Radical structuralism | O b j e c t i v e | | |
| | Interpretist | Functionalist | | | |
| | | The sociology of regulation | | | |

By viewing systems from within the interpretive paradigm, they appear to be messy and undefined existing only as creations of human beings. Understanding such systems can only be achieved by subjectively understanding the view of those who created them. It is not practical to construct a quantitative model of such a system. One on one interview is an instrument used to gain detailed information for the purpose of studying the system.

To assist in deciding which methodology is most appropriate Flood and Jackson (1999: 32) groups the most logical systems methods and methodologies into a “*system of systems methodologies.*”

First, they group them according to two dimensions:

- Systems
- Participants

They then classify systems into two categories:

- Simple systems
- Complex systems

Each system being defined by a set of characteristics.

Drilling down deeper into problem solving, Flood and Jackson (1999: 34) consider the “*political metaphor*” concerning groups and individuals and the relationships that exist in terms of power. In Industrial Relations literature, “*three contrasting views exist*” (Flood & Jackson, 1999: 34) and the participants can be classified as:

- Unitary
- Pluralist
 - They have a basic compatibility of interest
 - Their values and beliefs diverge to some extent
 - They do not necessarily agree upon ends and means, but compromise is possible
 - They all participate in decision making
 - They act in accordance with agreed objectives
- Coercive

I have included pluralist factors, as they are applicable to my research.

Combining the ‘Systems and Participants dimensions’ creates a six celled matrix (Figure 3.5):

Figure 3.5: An ideal type grouping of problem contexts (Flood & Jackson, 1999: 35)

| | UNITARY | PLURALIST | COERCIVE |
|---------|-------------------------------|---------------------------------|--------------------------------|
| SIMPLE | Simple - Unitary (S-U) | Simple - Pluralist (S-P) | Simple - Coercive (S-C) |
| COMPLEX | Complex - Unitary (C-U) | Complex - Pluralist (C-P) | Complex - Coercive (C-C) |

Flood & Jackson (1999: 35) then consider the following “*systems approaches*” according to their underpinning assumptions and group them per cell (Figure 3.6).

- Systems approaches:
 - Operational research (OR)
 - Systems analysis (SA),
 - Systems engineering (SE)
 - Systems dynamics (SD)
 - Visible systems dynamics (VSD)
 - General systems theory (GST)
 - Socio-technical systems thinking (STST)
 - Contingency theory (CT)
 - Social systems design (SSD)
 - Strategic assumptions surfacing and testing (SAST)
 - Interactive planning (IP)
 - Soft systems methodology (SSM)
 - Critical systems heuristics (CSH)

Figure 3.6: A grouping of systems methodologies based upon the assumptions they make about problem contexts (Flood & Jackson, 1999: 42).

| | UNITARY | PLURALIST | COERCIVE |
|---------|---|--------------------------------------|----------------|
| SIMPLE | (S-U) • OR • SA • SE • SD | (S-P) • SSD • SAST | (S-C) • CSH |
| COMPLEX | (C-U) • VSD • GST • STST • CT | (C-P) • IP • <u>SSM</u> | (C-C) ? |

In summary, Soft Systems and Interpretative Action Research approaches will be used for this research.

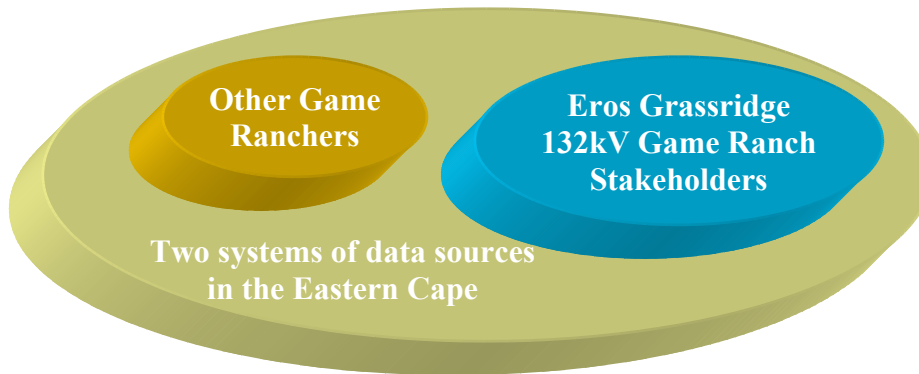
3.6 TECHNIQUES

3.6.1 Sample

A sample of 5 to 10 will be selected from within the Eastern Cape. “*Sampling redundancy*” (TerreBlanche & Durrheim, 1999: 45) would have been the preferred option, but time constraints and logistics do not allow for it. One of my main concerns is selecting a representative sample. The proposed Eros Grassridge 400kV power line affects numerous game ranches in the area. The attitude amongst these stakeholders is very negative at the moment, see Table 2.3.

By selecting a sample of stakeholders exclusively from this group, there is the risk of producing a one sided view. Stakeholders with opposing views periodically form alliances for a common cause, which could result in data distortion. As a result, I need to select participants from within the broader system of game ranchers in the Eastern Cape.

Figure 3.7: Systems map indicating data sources with regards to game ranchers



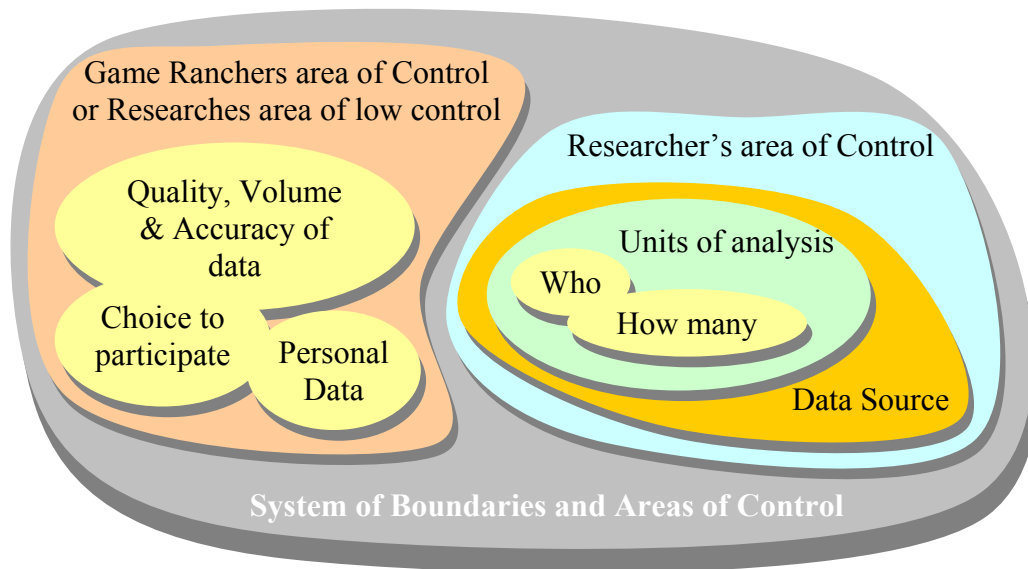
3.6.2 Data Collection

One on one interviews will be conducted and recorded on a tape recorder. A technique known as Appreciative Inquiry (AI) (Watkins and Cooperrider, 2000: 1) will be employed wherever possible. This technique focuses more on positive rather than negative experiences and has the ability to uncover underlying assumptions and theories. I have specifically selected one on one interviews to avoid possible group dynamics that may cloud or influence individuals perspectives. Interviews were selected ahead of questionnaires in order to provide “*rich and detailed observations*” (TerreBlanche & Durrheim, 1999: 47) of the social processes as the constructors of “*knowledge and knowledge constructed*” interrelate (Kvale, 1996: 15). However, an interview schedule will be used as a reference in the event that some relevant issues are not covered. Kvale (1996: 3) uses the metaphor of a researcher as a “*traveller*”, travelling through an environment, using conversation to seek and explore specific topics, asking questions that encourage individuals to share their own experiences and stories. This is typical of “*constructive understanding*” (Kvale, 1996: 5) using a “*conversational approach to social research*” (Kvale, 1996: 5). A key technique is to “*critically follow up answers*” (Kvale, 1996: 6) by testing the interviewee’s accuracy or “*strength by doubting it*” (Kvale, 1996: 6). Bearing in mind it is the deeper unconscious layers that retain the underlying assumptions or theories that are sought without asking leading questions.

However, with this in mind, boundaries, politics and dependency cannot be ignored in the data collection process. The Systems Map (Figure 3.8) displays boundaries created to identify areas of control and dependencies. Clearly, the game ranchers have the final say as to whether to participate or not and have the choice as to the amount and accuracy of data they will share. Adequate and accurate data is essential for sound analysis and interpretation. I am totally dependent on them for the success of the research, and as such, they could also be referred to as areas of low control.

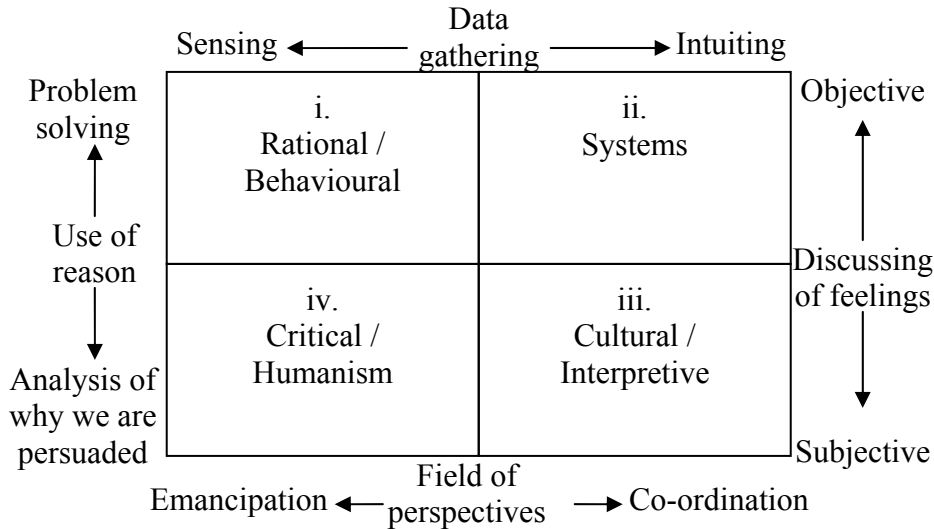
Due to constraints already mentioned, transcribing, although the preferred choice, will be very unlikely. The fact that the dissertation requires partnerships and teamwork and change management is required as the need presents itself, approaches to Organisational Change are included.

Figure 3.8: Systems map indicating boundaries and areas of control



3.6.3 Organisational Approaches and Change perspectives

Figure 3.9: Four Organisational Approaches. (Felkins, Chakiris & Chakiris, 1993: 61)



Modified diagram from Felkins et al., 1993: 181

Table 3.1: Different perspectives on change. (Felkins, et al., 1993: 86)

| Approaches | Context In what context is this change taking place? | Technology What methodologies are most effective in bringing about change? | Co-ordination How are people, technology, and resources coordinated? | Results What change results are most important? |
|------------------------------|---|--|--|---|
| i. Rational / Behavioural | Limited Regulative Professional discipline Management Industry standards Market needs | Expert knowledge Problem solving Objective measurement Data collection Instructional design Observation | Control Exclusivity Leadership Information | Understanding Knowledge Improvement Efficiency Prediction Cost effectiveness |
| ii. Systems | Macro & Micro levels Environment Open & closed Holistic Input & output Global Competitive | Architecture Organisational mapping Models Structure Processes Planning | Interrelated groups Hierarchy of learning Communication Feedback loops Alliances Transfer competency | Relationships Unity Alignment Resource utilisation Discovery Transformation |
| iii. Cultural / Interpretive | Culture Community Episodes Group History Nation 'Created reality' | Metaphor & symbol Narrative Language Dialogue Negotiation Facilitation Collaborative inquiry Futuring | Interaction Rules Conversation Roles Interpretation Core values Agreements Shared understanding | Consensus Coordination Responsiveness Commitment Cooperation Invention Innovation |
| iv. Critical / Humanism | History Culture Politics Economics Society | Rhetoric Interest groups Linguistics Confrontation Dialectic thinking | Persuasion Power Structure Ideology | Awareness Emancipation Action Self-determination Autonomy Social responsibility |

Text in red indicates elements applicable to the dissertation. As can be seen, it falls essentially in the 2nd and 3rd quadrants. My personal choice would be to place it in the 3rd quadrant because it has characteristics identified in all fields. Quadrant iii involves social interaction, cultural values etc which is consistent with section 3.5.

Figure 3.10: Total number and applicable factors as per **Table 3.1**

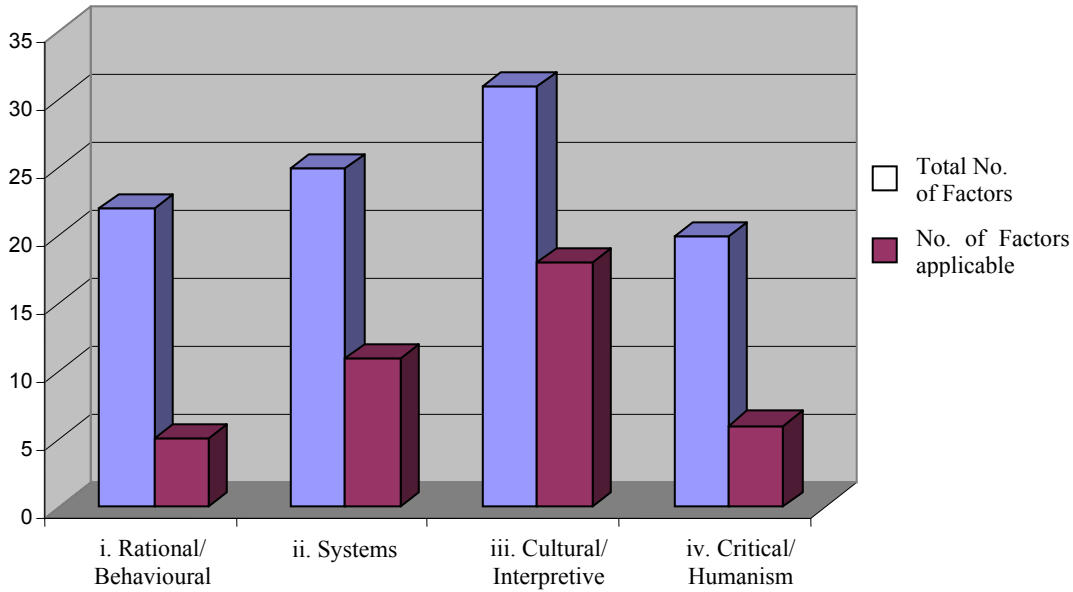
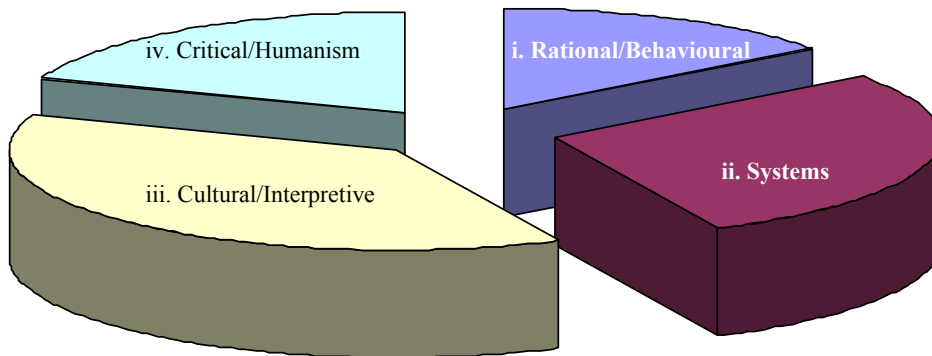


Figure 3.11: Pie graph indicating percentage of factors (**Table 3.1**) applicable to the dissertation



3.6.4 Partnerships

As in any organisation, partnerships and alliances exist. In the context of the electricity distribution system, the organisation can be defined as a “*macro organisation*”, consisting of partnerships between Eskom and Property owners. Change within the organisation, “*Single organisation*”, can be described as a “*micro*” level. Based on this, the dissertation was “*inter-organisational*”, therefore defined as a “*macro processes*”. There are influencing “*external forces beyond the boundaries of the practice*” (Huntington as cited in Rhydderch, Elwyn, Marshall & Grol, 2004: 215). This increased the complexity of the situation. Hence, it is the human component that needs to be managed and motivated.

3.6.5 Teamwork as a structure for change

The data assembly phase is ultimately dependent on the game rancher’s co-operation. Communication was a key element in the data assembly process, consisting of a number of two man teams; the game rancher and the researcher. Felkins, et al., (1993: 181) suggests teamwork as a “*structure of change*” which is a desirable of the objective.

The success of the dissertation depends on a “*co-operative research alliance*” (Felkins et al., 1993: 183). Felkins et al., (1993: 181) use the term “*adhocracy*” to describe a structure of temporary alliances which forms the “*action research team*”. The purpose of the team is to create a unified body from two culturally different organisations. Each with invisible yet clearly defined boundaries. This allowed more people to participate and influence the dissertation. This joint venture would effectively “*link resources and integrate goals*” by including stakeholders in a fact finding exercise (Felkins et al., 1993: 183).

“*Teamwork in information gathering, feedback and analysis is a continuing process that integrates change and aligns resources to accomplish organisational performance objectives*” (Felkins et al., 1993; 184).

3.6.6 Analysis

The recorded interviews will be played back as and when required. The aim here is to identify patterns, trends, themes in the data and “*relationships between them*” (TerreBlanche & Durrheim, 1999: 47) and using techniques of qualitative data analysis. Soft systems tools and techniques such as rich pictures to assist with identifying possible themes, are not excluded. “*The inquirer acts as a catalyst on raw data, generating an interaction that synthesizes new substance born alive from the catalytic conversion*” making the “*human factor its strength and fundamental weakness*”. (Patton, undated: 432). The challenge in qualitative data analysis is there is no standard formula or recipe to utilise. The outcome remains unique to my interpretation. However, the object is to identify the patterns and themes that run through the data like a colourful thread running through and decorating a garment. Its enhancing qualities must not detract from its primary purpose of providing “*strength and shape*” (Patton, undated: 432) to the fabric.

3.7 CONTEXT

Interviews will be conducted in their choice of environment. My role as the “*instrument of observation*” (TerreBlanche & Durrheim, 1999: 46) is to observe and record the data so as to be able to make accurate analysis and interpretation. With this in mind, I cannot ignore the possible impact my presence may have on the interviewee. Although my options are very limited, I will monitor behaviour and may need to refine the process where necessary within a fairly dynamic situation.

4 DATA COLLECTION AND ANALYSIS

'We are spending hundreds of thousands of rand on burying power lines, however tourists are used to infrastructure and all the bits and pieces, and probably don't notice it so much, but we (game ranchers) notice it and we do whatever we can do to create a natural environment'. Respondent 'F'

4.1 DATA COLLECTION PROCESS

4.1.1 Systems Concepts

Various systems concepts feature throughout all stages of the data collection and analysis process, purpose and communication being the key ones. Others used are, feedback, interconnectedness, trap, messes, difficulties, metaphors, self-sealing, self-fulfilling behaviour and system tools (diagrams).

4.1.2 Purpose of Data Collection

The purpose was to collect qualitative data for analysis. The objective was to gain a better understanding of the complexities and underlying assumptions.

4.1.3 Preparing for the Interviews

Based on the research problem, I drafted an interview schedule to ensure I covered the issues relevant to the problem. I then created a list of respondents I assumed would be able to provide the data I required to better understand the problem and to assist in making an analysis. The questions were then compared with the research problem, to ensure that the data would contribute to understanding the research problem (Ghuri & Gronhaug, 2002: 102).

As mentioned in Chapter 3, my method of data collection was one on one, unstructured interviews. Although I have never conducted an interview to establish an individual's perspectives and worldviews on a topic, I have throughout my working career been involved in many different forms of inquiry, formal and informal. Hence, this is not entirely foreign to me. However, for the first interview, I selected a game rancher living in East London.

This allowed for flexibility and convenience. If there were shortcomings or unintended consequences, the cost to re-interview or fill in any gaps would have had a very limited impact on cost and time. This was the conclusion from a quick theoretical risk assessment exercise. Hence, this would be a type of pilot interview.

4.1.4 Equipment

4.1.4.1 Topographical map

The topographical map with power lines displayed, provided an overview of property locations. It provided a holistic view of other features: terrain, vegetation, roads affecting the property, the number and position of power lines on the property. Hence, I had a mental picture while conducting the interview. With the knowledge of the physical attributes of the property I was partly prepared for the interview. However, an interview schedule was formulated.

4.1.4.2 Interview schedule

Although the schedule was designed to try and reveal underlying assumptions, I needed to obtain background information. This would assist in determining “*independent, dependent and intervening variables*”. (Creswell, 1994: 63)

- Visual

Respondent’s views and their perceptions of tourists or hunters views were focus points for the questions. I included the latter because from past experience the game ranchers always cited tourists as the main complainants.

- Unnatural Objects

This was an area I felt needed critical questioning. There are numerous unnatural features on game ranches that appear to be totally accepted by game ranchers and tourists and yet power lines are rejected. I needed to establish the thought process for this behaviour

- Property values

One of the other negative factors often cited by game ranchers about power lines was the devaluing of property. Hence, the intention was to establish their perspectives based on factual evidence.

- Rights of Way

Security, loss of control and maintenance, are areas requiring investigation. Third party agreements have always been mentioned as a weak link in property owners' control over their properties. They refer to opportunists, such as poachers, stock thieves etc as taking advantage of the situation.

4.1.4.3 Tape recorder and note pad

- Advantages

My preference for recording interviews would be by tape recorder. This would allow me to concentrate on what the respondent is saying and observe his behaviour at the same time.

- Disadvantages

The processing of recordings into text format is costly and time consuming. A summarised transcription will be recorded.

- Notebook and pen

The notebook was used to record thoughts, questions and links between issues. In fact the understanding and analysis process was executed in real time, as I reflected on data communicated by the respondents. These thoughts were recorded immediately.

4.1.5 Selection of candidates

4.1.5.1 Purpose

A spread of game ranchers was selected, varying from those used by the family for their own enjoyment and limited hunting, to others who rely on commercial hunting to sustain themselves, as well as non consumptive eco-tourism organisations.

4.1.5.2 Locality

Although there has been an explosion of game ranchers in the Grahamstown area and the temptation to select respondents from these properties appears to be logical and very strong, however, other factors needed to be considered. The proposed Eros Grassridge 400kV Line has created considerable uncertainty and concern within the game ranching system in the area.

Hence, focusing on this area alone may not produce a balanced reflection of individuals perspectives (section 3.6.1). As a result, nine respondents were interviewed from various districts within the Eastern Cape. See Table 4.1 for more detail. Of the nine game ranchers, a possible five could be affected by the proposed Eros Grassridge 400kV line.

4.1.5.3 Services

Exposure to the cause and effects of power lines was essential for the respondent to answer the questions. Hence, each property had to have at least one power line on it. Being affected by public roads was not a requirement, although comparisons were made regarding impacts.

4.1.5.4 Interview details

Table 4.1: Interview appointment details

| Respondent | Date | Time | Locality of game ranch | Duration (minutes) |
|------------|--------------|-------|------------------------|--------------------|
| A | 16 July 2005 | 08h00 | Cathcart district | 40 |
| B | 18 July 2005 | 16h30 | Komga district | 40 |
| C | 19 July 2005 | 16h30 | Komga district | 45 |
| D | 20 July 2005 | 16h30 | East London district | 45 |
| E | 22 July 2005 | 08h00 | Grahamstown district | 30 |
| F | 22 July 2005 | 09h00 | Patterson district | 45 |
| G | 22 July 2005 | 10h45 | Alicedale district | 45 |
| H | 22 July 2005 | 12h15 | Grahamstown district | 45 |
| I | 22 July 2005 | 14h30 | Alexandria district | 40 |

The interviews were planned over the shortest possible time, consequently, making it easier to remember the all important detail from the interviews, i.e. behaviour, emotions, etc. Each interview was then summarized and transcribed to record important views, which was then used for the analysis and interpretation of the data.

4.1.6 Data Processing

4.1.6.1 Purpose

To record the data in a manageable form, resulting in two levels of information, individual interviews level and combined level of data. The sub headings used in the interview schedule were used for the processing and grouping of data at individual and combined level. It also facilitated searching for data.

- Individual interviews data level

The first process summarised the individual interviews and key quotes were extracted and transcribed. The summarised data was categorised and grouped under the appropriate sub headings. Each sub heading contained the respondent's details. This ensured that a record of each respondent's responses was maintained for data integrity.

- Combined interviews data level

The summarised data was then combined and grouped according to sub headings into one document, retaining the sub headings with respondent's details. This facilitated the identification of the respondent when a quote was extracted for use in the dissertation.

4.2 PRESENTATION OF DATA

4.2.1 Purpose

The purpose of this section is to present a summary of the perspectives and worldviews of the respondents. The most prominent theme common to all respondents was the visual intrusion of power lines. Eight of the nine respondents were very opposed to lattice type towers because of the visual intrusion.

Although the methodology is qualitative, a table is included to provide a holistic view of the respondents' views. There are multiple factors that need to be considered when evaluating the impact of a power line, some of which are, locality, visibility, type, size and the nature of business. Hence, this needs to be borne in mind when viewing the contents of this table.

NB. A conclusion based on quantitative analysis cannot be made.

Table 4.2: An overview of respondents responses.

| Subject | Respondents agreeing | Respondents disagreeing | Respondents undecided |
|--|----------------------|-------------------------|-----------------------|
| Visual intrusion has a negative impact | 7 | 1 | 1 |
| Property values are devalued | 6 | 1 | 1 |
| Security and control is compromised | 1 | 3 | ? |
| Maintenance can be problematic | 4 | 4 | 1 |

4.2.2 Visual Intrusion

Aesthetics was a high priority and elicited the most emotional response from the majority of respondents (endorsed in Table 2.3). The different type of towers were a factor, “*the small, little power lines don’t hassle me personally*” (Respondent B) but Lattice type towers “*are an eyesore*” (Respondent B). Game ranchers felt that tourists “*coming for a safari experience, want the wildest Africa they can get*” (Respondent E) and “*we do whatever we can do to create a natural environment*” (Respondent F). According to Respondent G, a tourist commented, “*is this an industrial area we are hitting over here, or did we spend a lot of money to be in the bush*” (sic). The illusion of “*Darkest Africa*” (Respondent D) appears to be a high priority and when you encounter a “*first world object like a power line, you lose that effect*” (Respondent D) and they “*leave a trail that man has been here*” (Respondent C).

Some game ranchers indicated their commitment by building lodges “*into the mountain sides where impact is minimal*” (Respondent E) and spending “*two million rand replacing overhead lines with underground cables*” (Respondent H). Respondent C said an overhead line was not an option and “*I paid one hundred and seventy five thousand rand to have it underground ... so that it wouldn’t spoil the beauty of the property here*”. To add to this, one respondent questioned the justification of the huge capital expenditure in replacing overhead lines with underground cables as against investing this money in additional game or additional accommodation which may have resulted in far greater returns.

4.2.3 Tourist or game rancher views

All of the respondents spoke of the ‘African Experience’ in some form or another that tourists expect and they commented that a power line detracted from that. However, complaints from tourists and hunters regarding power lines appeared to be limited, and Respondent A wondered what a *“first time visitor to Africa views were, or is this all engineered by us (game ranchers)”*. Three of the nine respondents remarked that tourists had commented on power lines. However, this appeared to be infrequent. Two of the five respondents from non-consumptive eco tourist organisations considered if the whole visual intrusion debate was a perspective of game ranchers and is possibly not as big an issue for tourists as it is made out to be.

Some respondents voiced similar sentiments and wondered if *“maybe it is something that we (game ranchers) feel is more important than what it really is”* (Respondent E) and *“who have we actually pleased? Is it the guest who will see the power lines or is it our purist sentiment about the whole thing”* (Respondent H)? Expanding on this, Respondent I remarked that *“SA is a developed country and people need to accept that it is the sign of the times”*.

4.2.4 Un-natural Object other than power lines

The ‘Darkest African Experience’ was a key issue that could not get explained during the interviews, other issues were the unnatural features (listed below) which form an integral part of the African experience:

- Roads
- Game drive vehicles
- Lodges

During the interviews, I concentrated on the three factors above because they interconnected with the so called African experience. However, other unnatural features developed for previous land use, also featured in the interviews. These features have been accommodated, *“where existing reservoirs were required we have retained them and tried to disguise them so that the guest don’t see them. However if an elephant is standing at a reservoir or at a fence the guys will drive in to see it, but it is how that situation is sold that will determine if it is viewed as negative or positive by the guests. But a power line is totally different, you cannot explain it away, or maybe you can, do you want air conditioning or not”*? (Respondent H).

The latter part of that comment by Respondent H, *“but a power line is totally different, you cannot explain it away, or maybe you can, do you want air conditioning or not”*? indicates that game ranchers feel ambivalent when thinking about power lines. It was only when I critically questioned them on other unnatural objects that they began to reflect and reconsider their perspectives.

4.2.4.1 Roads

Game Drives are conducted on well defined bush tracks caused by vehicles and properly constructed roads. When questioned about the impact of roads, the comments reflected a common view that convenience was important because *“they need roads to get from point A to point B and for game viewing, without roads they will not see the animals”* (Respondent A) and *“I think it is an issue of convenience”* (Respondent B). To some there was no alternative, *“it is a necessity, roads have been built since Roman times, it is one of the things that people just accept”* (Respondent C). It was matter of confining the impact, *“by controlling the damage where you drive, you are limiting the damage and you are not affecting the eco system”* (Respondent D). In this case, visual intrusion was a consideration, *“yes we do have to have roads if you want to do game viewing, but you can do it in such a way that it is not as visible because at the end of the day they don’t want to see magnificent roads”* (Respondent G).

4.2.4.2 Game drive vehicle

Game viewing is conducted from vehicles (usually land rovers) purposely modified. Here, first world technology is used to contribute to the African experience. Absolute silence, apart from the essential natural sounds emanating from the fauna and flora, is considered a true wildlife experience. Many eco tourist destinations advertise their vehicles so, *“it is understood that a vehicle will be used and there will be a game lodge but it is not understood that there will be power lines”* (Respondent D). For some, even the type of vehicle is important, *“when you are on a safari a landrover is part of it, it’s part of the image”* (Respondent E) and a way of *“of getting you around”* (Respondent E).

4.2.5 Property Values

This part of the interview focused on the respondent's own perceptions of property values that are affected by power lines. *"Power lines do have a negative effect, quantitatively I cannot say how much"* (Respondent E). When asked if power lines affect the value of a property Respondent C replied, *"it would with me"*, but he felt that would vary from person to person. *"Power lines do have a negative impact, aesthetics are vital to the experience"* (Respondent H).

"In terms of supplying electricity it can have a positive impact" (Respondent D), this comment applied to rural lines. However sub transmissions lines definitely reduce the value because *"if you had two identical Ranches, one with and one without, the one without would have a higher value"* (Respondent D). Respondent A was adamant that *"the price is fixed per ha and if the neighbouring farm is sold for R2000/ha, the adjoining farms are then valued at the same price"*. However, when asked if he had to buy another game farm, would he consider the existence of power lines he replied, *"I would definitely consider them"* (Respondent A). Thus, Respondent A is prepared to accept the current power lines because they have always been there, but would resist any new lines.

4.2.6 Rights of Way

4.2.6.1 Security and Maintenance

- Security

Having other people on your property definitely does create *"another window"* (Respondent E) for criminal activities. Eskom makes use of contractors and sub contractors and *"the more contractors you have on the property, the more eyes you have around"* (Respondent B) and information can be shared with regards to cycads etc which they would prefer to remain confidential. *"Eskom is using a lot of sub contractors, but no one is checking up on them"* (Respondent G).

- Maintenance

Line patrols using helicopters is problematic because *"game on the farm was captured by helicopter, as a result they are very skittish"* (Respondent B) and this creates problems. *"Helicopters are used for maintenance"* (Respondent F). *"Constant cleaning of the vegetation leaves a scar"* (Respondent D), therefore clearing should be restricted to a path.

The “*scar caused by bush clearing*” (Respondent F) is also a concern, this contributes to the visual intrusion.

- Associated Dangers

This ranch is used for hunting and game viewing, and “*there’s a problem here, a big problem, we have dangerous animals, we are not aware he (Eskom staff) is on site, he (Eskom staff) is not familiar with dangerous animals*” (Respondent G). A hunting accident can easily occur. Respondent G further indicated that it is essential that a competent person is sent along as a guard; “*you have to send a professional hunter, because you have very expensive game*” and the decision to shoot for self protection is a fine line that needs to be made under dangerous circumstances. Implying you cannot shoot a buffalo worth R175 000 that was possibly not necessary.

4.3 INTERPRETATION OF DATA

4.3.1 Overview

Let me begin by placing the game ranchers and tourists’ views in perspective. The interviews were conducted with game ranchers only. However, they also expressed views to that of the tourists, and this corresponds with comments in Table 2.3 . Therefore, the view of the game ranchers towards power lines is primary data, while their perceptions of the tourists’ views can only be classified as secondary data. The true perceptions of the tourists would need to be expressed by themselves.

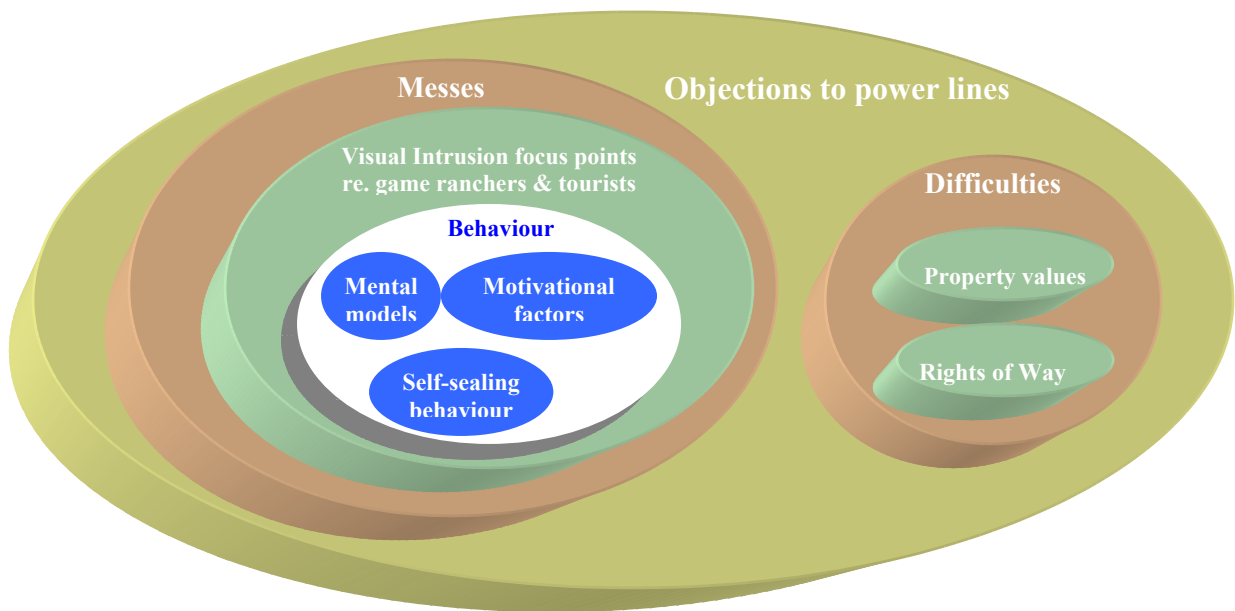
Secondly, I have included the characteristics of a mess and a difficulty (Table 4.3) to support my belief that this is a complex problem and should be defined as a mess. This research problem has all the characteristics of a ‘mess’ (The Open University, T551: Systems Thinking and Practice: A Primer 2000: 29) as displayed in Table 4.3. Every one of the characteristics associated with a mess is applicable to the research problem.

The third point, as per the characteristics of a mess, amongst others this problem involves people and their emotions. Because of this I intend focussing on motivational theories and factors that contribute to the perspectives and worldviews that ultimately influence people’s behaviour and their mental models.

Table 4.3: Comparisons of a Mess and a Difficulty

| <i>Characteristics of a MESS</i> | <i>Characteristics of a DIFFICULTY</i> |
|----------------------------------|--|
| People and emotions involved | Solution is evident |
| No clear solutions | Can be rectified timeously |
| Problem ill-defined | Problem well-defined |
| Cannot be unbundled | Can be quantified |
| Extended duration | Has hard complexities |
| Unbounded | Can be rectified in isolation |
| Beyond your control | Can be contained |
| Hard & soft complexity | |

Figure 4.1: Systems map indicating focus points



At a high level, the sub topics displayed in Figure 2.2 that were investigated, had varying degrees of complexity. Based on my perspective, the visual intrusion and related issues elicited the greatest response and were the most complex. Hence, the focus will be on the behaviour of game ranchers by considering the following points:

- Motivation: With this in mind, an attempt will be made to gain an understanding of their motives for their behaviour. To assist with this, theories relating to people motivation and the associated behaviour are discussed to obtain a better perspective of the game rancher's point of view. Two basic approaches will be considered, content and process.
- Mental Models: To understand why power lines were considered unacceptable while other unnatural objects were acceptable to game ranchers.
- The Rights of Way and associated issues (security, maintenance etc.) were less complex and to a degree could be unbundled and controlled.

4.3.2 Behaviour

4.3.2.1 Characteristics of motives

According to Reece and Brandt (as cited in author unknown, General Management Principles, undated: 224) "*motives are individualistic*" as unique human beings our goals can all be different. "*Motives change*" (author unknown, General Management Principles, undated: 224) as a property owner transforms his business from traditional stock farming to game ranching. "*Motives may be unconscious*" (author unknown, General Management Principles, undated: 224), therefore the game rancher's actions could be determined by desires of which they are not aware. With this in mind, the objections to power lines or the restricting of access may be triggered by other needs and not visual intrusion or the protection of their property and game. "*Motives can be inferred*" (author unknown, General Management Principles, undated: 224), hence, we can only "*draw conclusions*" (author unknown, General Management Principles, undated: 224) as to what causes a game ranchers behaviour. This was the purpose of the interviews, was to enquire about issues regarding power lines and game ranching, in an attempt to surface underlying assumptions. Finally, "*motives are hierarchical*" (author unknown, General Management Principles, undated: 224) and game ranchers will prioritize their motives, of which the most prominent will usually guide their behaviour. Further to this motivational theories consist of two basic approaches, content and process approaches.

4.3.2.2 Content Approaches to Motivation

The purpose for focusing on content approaches to motivation, is that they “*emphasize factors within individuals that guide their behaviour*” (author unknown, General Management Principles, undated: 224). In other words, they focus more on the needs and incentives that influence people’s behaviour. For this reason, I have selected a number of theories that may provide a better understanding of what could be influencing game rancher’s behaviour. A brief description accompanies each theory, and these will be quoted in context in the summary in section 4.3.2.4.

- Maslow’s “*hierarchy of needs*” assumes needs to be “*placed in a hierarchy*” where at the lowest level are “*physiological needs*” then “*safety needs*” then “*affiliation needs*” followed by “*esteem needs*” and finally the highest level “*self actualization needs*” (author unknown, General Management Principles, undated: 224).
- Alderfer’s “*ERG (existence, relatedness, growth) theory*”, assumes people are motivated by basic “*existence needs*”, interpersonal and interaction known as “*relatedness needs*” and finally an individual’s “*growth needs*” in the form of their “*creative or productive contributions*” (author unknown, General Management Principles, undated: 227)
- Herzberg’s “*two-factor theory*”, involves maintenance and motivational factors. Maintenance factors are essential items such as organisational policy, administration, equipment, interpersonal relationships, salary, status, work security and conditions. Motivational factors (growth factors) are concerned with “*job content*” such as job enrichment, job enlargement, recognition, achievement etc (author unknown, General Management Principles, undated: 227).

Table 4.4: Comparison of Herzberg's and Maslow's theories

| | Herzberg | Maslow |
|----------------------|---|--|
| Maintenance Factors | <ul style="list-style-type: none"> • Interpersonal relationships • Policy and administration • Job security, salary, work conditions | <ul style="list-style-type: none"> • Affiliation • Safety, security • Physiological |
| Motivational factors | <ul style="list-style-type: none"> • Recognition, status, advancement • Job enlargement & job enrichment | <ul style="list-style-type: none"> • Esteem needs • Self-actualization |

All three of the above theories have common aspects about them.

- McClelland's theory of needs assumes a need to surpass normal standards known as the *"need to achieve"*. The *"need for power"*, the underlying theory is an individual's need to *"influence and control"* others to change their behaviour. Finally, the *"need for affiliation"* or to be part of or accepted by others, groups etc is a trait people by and large strive to achieve (author unknown, General Management Principles, undated: 228).

A summary of the content approaches can be found in section 4.3.2.4.

4.3.2.3 Process approaches to motivation

Process approaches to motivation concentrates on *"why people choose certain behavioural options"* for self gain, and *"how they evaluate their satisfaction"* on attaining their aim.

Vroom's *"expectancy theory"* is based on two aspects – the level of desire and achievability. These are in turn underpinned by four assumptions:

- Behaviour is determined by the individual and the environment
- Stakeholders make their own decisions about how to behave in organisations
- Stakeholders are unique and have different needs
- *"People will act in a certain way, and the tendency to act in a certain way depends on the strength of the expectation that the action will be followed by a given outcome, and the degree to which the person desires the outcome"* (author unknown, General Management Principles, undated: 229-230).

The three concepts in the theory are:

- Valence (desirability) refers to level of appeal a situation may present. Positive valence for a game rancher is a property without power lines and all the associated complexities. Negative valence would be just the opposite.
- Instrumentality refers to the intensity of a person's belief that a certain effort will achieve their desired goal.
- Expectancy refers to a stakeholder's assessment that a certain effort will achieve their desired goal (author unknown, General Management Principles, undated: 229-230).

Stacey Adams "*Equity theory*", (author unknown, General Management Principles, undated: 230) is based on stakeholders comparing their situations with others in the same industry. It is not uncommon for a Utility, like Eskom, to confine their power lines to a corridor. This essentially means that certain game ranchers may be affected by multiple lines and others have none besides the rural supply line. In cases like this, game ranchers compare their situations and it could be said that inequity exists due to the level of impact of the power lines.

"*Goal setting theory*" (author unknown, General Management Principles, undated: 231) assumes all things to be one and the same, that outputs will be enhanced if there is a common goal. The weakness of this is that organisations are generally pluralistic in nature, consisting of unique individuals each with their own goals. An example of this has already been discussed regarding the purpose of game ranchers and Eskom. Each has diverse goals resulting in a form of goal displacement and therefore, complexities arise because of the inter-dependencies.

"*Cognitive theory*" assumes that poor performance on a number of tasks by a stakeholder will be repeated on other tasks (author unknown, General Management Principles, undated: 231).

Lastly, "*reinforcement theory*" implies that "*behaviour is a function of its consequences*". This implies that a game rancher that has experienced a negative effect due to power lines will in turn respond negatively to Eskom's needs. This is typical of cause and effect (author unknown, General Management Principles, undated: 231).

Table 4.5: Motivation Theories - Content and Process approaches

| Content | Process |
|-------------------|---|
| Maslow's theory | Expectancy theory – Valence, Instrumentality, Expectancy |
| Alderfer's theory | Equity theory – Comparisons |
| Herzberg's theory | Goal setting theory – assume people strive towards a definite goal (RUGS) |

4.3.2.4 Summary of content approaches

I see a combination of underlying theories evident throughout most of the behaviour of game ranchers.

- Maslow's higher level needs are prominent in game ranchers' worldviews. Based on their assumptions about the negative impacts power lines have, this would mean that the inverse would then also be true.

Therefore, the absence of power lines would have a positive impact resulting in a sense of achievement, due to an assumed appreciation by tourist's of a pristine environment.

- Alderfer's ERG theory of growth needs cannot be excluded either. A game rancher who manages to maintain or improve the natural environment, free of unnatural objects will identify this as a contribution and a significant factor in his goals.
- Herzberg's motivational factors are also prominent because of the achievement and status aspect and the expectant feedback in the form of word of mouth advertising and the associated financial benefits.
- McClelland's need for achievement to be successful or to be seen as the benchmark on which others are judged, also features as a motivating factor. His second need, that of control is clearly displayed by their actions and behaviour towards controlling who has access and at what point stakeholders will have access to their ranchers.

4.3.2.5 Summary of process approaches

The above discussion has essentially focused on needs and incentives. The following sections will focus on the *“process perspectives on motivation, why people choose certain behavioural options to satisfy their needs, and how they evaluate their satisfaction after achieving the goal”* (author unknown, General Management Principles, undated: 228).

All three concepts of Expectancy theory are evident throughout all perspectives.

- *Valence* - The desirability or valence of owning a game ranch without power lines, communication mast or public roads is undoubtedly the highest priority of a game rancher. This is obviously assuming all else being equal, i.e. locality, extent and topography of the ranch.
- *Instrumentality* refers to the strength of a person's belief that a certain performance will lead to a desired outcome. All of the non-consumptive eco-tourist game ranchers believed that power lines had a negative effect on the African experience and this was further reinforced when not one could provide concrete supportive evidence that it indeed had any impact. This is a typical worldview; they had no doubt in their theory. Their belief determined their behaviour.

- *Expectancy* theory essentially means that a certain level of effort will result in a desired outcome. This is evident in the game ranchers' reactions to proposed power lines. A typical example is the comments recorded in Table 2.3, with regards to the proposed Eros Grassridge 400kV line. Alliances are created to form a unified front raising the level of effort. Their assumption is that if enough of them object to a proposed power line, they stand a good chance of influencing the outcome. This assumption is correct, because that is one of the purposes of the public participation meeting.
- Equity theory, as already stated in the power line and game ranching system, is not a unifying factor that draws game ranchers together. In fact, it has the ability to polarize a community because property owners compare each others situation's and generally attempt to influence the routing of the line so as to locate on a neighboring farm. It is a case of 'why must I have the line on my property and not my neighbour'? Hence, there are these ever changing constellations of alliances that form and disband depending on the context of the situation. These alliances, at times consist of sub groups with their own set of complexities.
- Goal setting theory has already been discussed in section 4.3.2.3 and it is very unlikely that common goals could ever be achieved without spending large sums of money on alternative technology.
- Reinforcement theory is also a motivation for objecting to lines as already discussed in section 4.3.2.3

4.3.2.6 Conclusion to motivational factors

In conclusion, the sense of achievement of a pristine environment is a need and the incentive to a satisfied tourist, who will in turn advertise by word of mouth which in itself is a cost benefit and attracts more tourists which increases financial income. It is these underlying assumptions which guide their behaviour. Quite often during the low periods of the international tourist season, specials are offered to local South Africans. I can only assume this is linked to economics, which confirms my assumption that economics is the determining factor.

Furthermore, the behavioural option is to object to overhead power lines, the most common strategy being a united front opposing the construction of the line. The fact that a unified voice carries more weight than individuals, results in the formation of alliances. This is typical of the behaviour Eskom experiences with game ranchers.

4.3.3 Mental Models

My intension in this section is to consider the underlying causes or contributing factors of people's perceptions of an African experience, bearing in mind the outcome of the interviews in which visual intrusion was to a large degree the most prominent reason (endorsed in Table 2.3) for game ranchers opposing to power lines. This idea needs to be emphasized so that the reader has a holistic view of the focus area, while specific points are being dealt with. The root cause analysis being dealt with in this section is the perception of an African experience in a developed country, and in an area that is traditionally used for domestic stock farming. The purpose is to try to understand how mental models are constructed and what possible contributing factors and features used to create this perception of an African experience. Various systems concepts and tools will inform this particular discussion. Each sub-section will make use of a different system concept and tool to reinforce the outcomes.

4.3.3.1 Trap

The purpose of this section is to understand the implications of a 'trap' and how we construct our mental models (Figure 2.5).

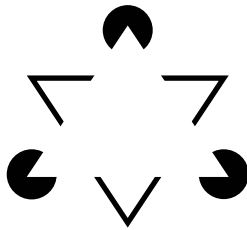
The word trap is used as a metaphor to resemble a state or position from which a person cannot escape. Therefore, traps include the way we think and the situations we find ourselves in ie. messes and difficulties mentioned in section 4.3.1. Hence, are game ranchers and tourists in a trap in their way of thinking and the situation they find themselves in?

Two characteristics of systems thinking is purpose and perspectives. My perspective as the analyst is that this issue exists due to a trap in the way game ranchers and tourists perceive African safaris/experiences also referred to as darkest and wildest African experience.

“The trap exists in the mental constructs that they are using to comprehend the situation – some of which may be the way that they are defining the system(s) involved. The solution to this category of difficulty is for the individual involved to make a change in their way of thinking about the issue – easily said, but extremely difficult for most people to accomplish”. (The Open University. T205: An Introduction to Systems Thinking (2000: 2).

The Kanizsa triangles are used to illustrate how mental models influence our thoughts, how we make sense of our surroundings. People commonly “*take bits and pieces about the world and use them to construct larger, complete pictures- mental models*” (April, 2003: 90). These are then used to understand how things around us function. In Figure 4.2, most people see two triangles and the blank one may even appear brighter than the background when viewing this model. In reality, there are no triangles. Try viewing the model again and not see the imaginary triangles. It is very difficult if not impossible.

Figure 4.2: “*Kanizsa Triangles*” (Kanizsa, 1955)



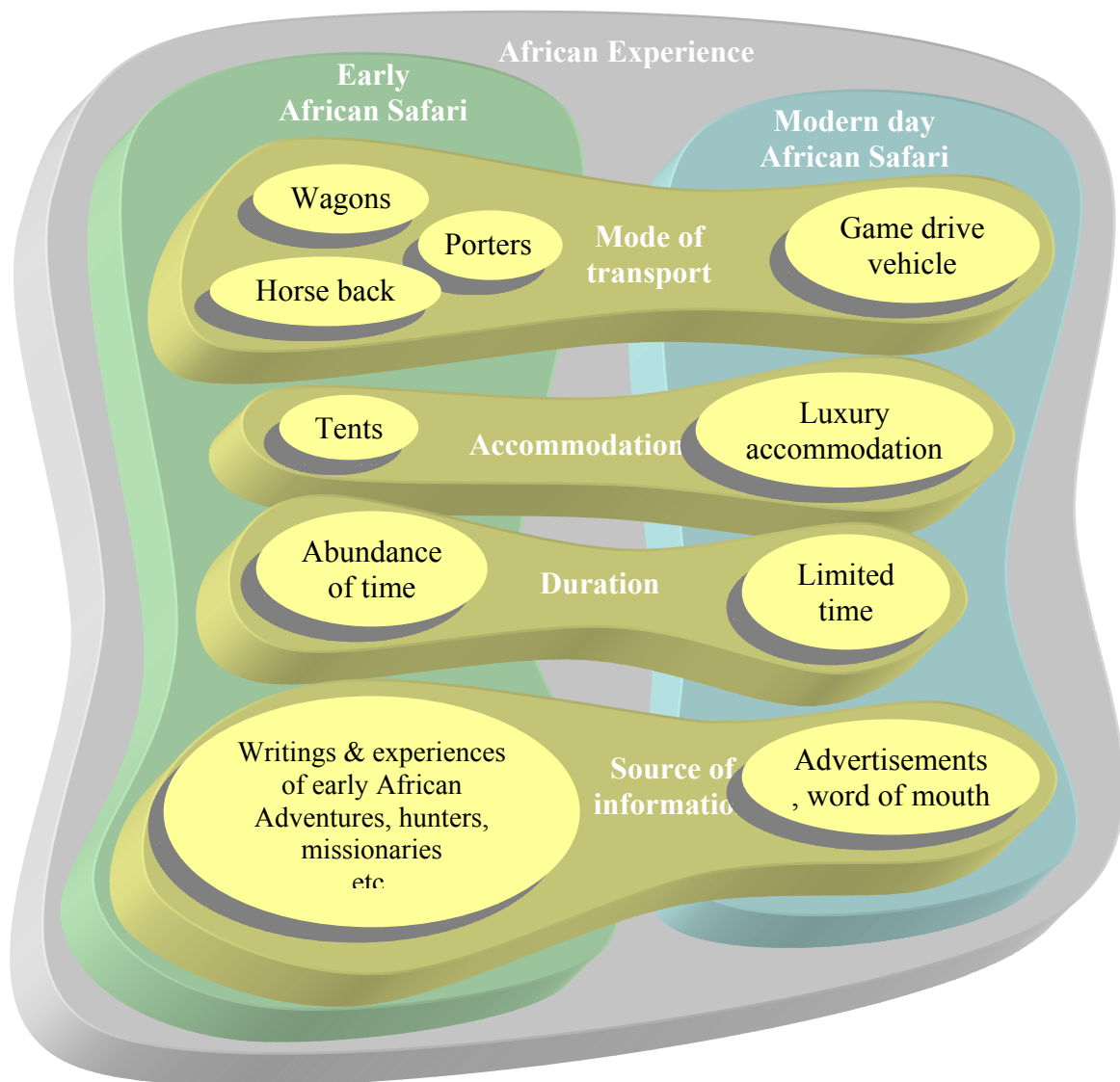
Certain decisions are made somewhere between the optic nerve of our eyes and the brain. Our mental model has a picture of a triangle firmly entrenched in it. This “*mental construct is used to comprehend the situation*” (The Open University. T205: An Introduction to Systems Thinking (2000: 2), but where gaps exist, assumptions are made. Hence, in this case, the mind is extending lines which join up to form triangles.

4.3.3.2 African experience metaphor

The purpose of this section is to investigate and establish the possible contributing factors to the African experience which is a metaphor derived from peoples’ perceptions of an old African excursion. A systems map, Figure 4.3, was developed to obtain a possible perspective of the factors and features that influence an individual’s mental model. The illusion of the African safari may emanate from various sources, such as stories of early African explorations. Four factors were considered and comparisons made between the old and the modern Africa. The systems map indicates characteristics of early African safaris and the equivalent of a modern day safari, which suits the tourists of today for various reasons.

Time is an important factor in a tourist's itinerary because *"firstly they are here for a very short stay, on average three days and they want to see as many different animals as possible in that period, and secondly they are scared of the animals"* (Respondent I). Therefore, there is a searching for the old Africa, but aligned to modern technology. This is where multiple perspectives need to be considered. This old Africa is non-existent today in areas previously developed as stock farms, yet it still exists in the subconscious minds of people and is still expected on an African trip.

Figure 4.3: Systems Map of factors contributing to the African experience metaphor.



Besides the original core of Addo Elephant National Park, all new game ranches/reserves were commercial farms with a first world infrastructure, but are now converted to conservation areas. This is known as the “*new face*” (Respondent H) of conservation, developing new conservation areas within existing structures, roads, power lines, old farms etc. He goes on to say, “*Addo is the central environmental development in the province. It has roads, power lines and it is still being managed as an environmental unit and still has large environmental credence within the system*” (Respondent H).

4.3.3.3 Self Sealing Behaviour

The purpose of this section is to reinforce what has already been discussed in sections 4.3.3.1 and 4.3.3.2 and to focus on unnatural objects other than power lines.

A typical example of self-sealing behaviour is “*a process in which one assumes something about others and then collects evidence to confirm it*” (The Open University, Concept File 3, 2000: 52)

This could sub-consciously be happening within the game ranching system, where game ranchers unsuspectingly continuously search for evidence to back up their theory.

The Open Universities T205: Concept File 2 course material (2000: 5) refers to “*theories of personal motivation and some of the self-sealing and self-fulfilling mechanisms that can profoundly affect people's perceptions*”. Coupled with the mental model, which “*dictates the type of information the person will perceive and that these perceptions will then reinforce the original belief*” (The Open University, T553: Modeling, (2000: 10) (Figure 4.4) justifying game ranchers’ behaviour. The Ladder of Inference (Figure 2.5 & section 2.2.7.1) provides an indication of how our thought processes and mental constructs influence our beliefs. As discussed in section 4.3.2.1, there are numerous motivational theories that appear to be guiding the behaviour of game ranchers.

A sign graph (Figure 4.4) has been included for the purpose of identifying feedback loops which could then inform my theory of the acceptance of unnatural objects other than power lines. The feedback loops are numbered to assist with identification.

4.3.3.4 Positive Feedback Loops

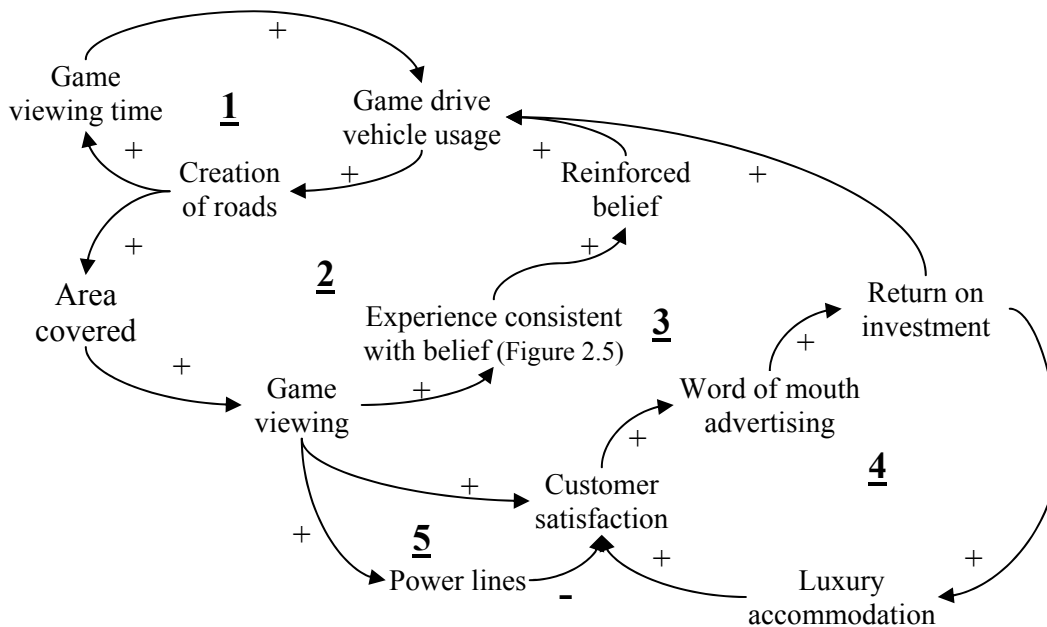
- Tourist

Considering that tourists have limited time available (Figure 4.4), they select the most appropriate method of game viewing to satisfy their need. Positive feedback loops 1 & 2 contain agents; ‘creation of roads’ and ‘game drive vehicle usage’ which contribute to self fulfilling behaviour whose outcomes are consistent with their beliefs, resulting in self sealing behaviour.

- Game rancher

Positive feedback loops 3 & 4 contain agents; ‘customer satisfaction’ and ‘word of mouth advertising’ which contribute to increased tourism resulting in an ‘increased return on investment’.

Figure 4.4: Sign graph diagram reflecting positive and negative loops and possible causes of self-sealing behaviour



4.3.3.5 Negative feedback loop

Negative feedback loop 5 combined with 3 have ‘power lines’, an agent considered by game ranchers to have a negative influence on tourists (endorsed in Table 2.3) African experience. The assumed effect is a dissatisfied customer, negative word of mouth advertising resulting in reduced return on investment.

- Access roads

A scar, caused by a road, can be far more visible over a further distance than a power line. Secondly, a road can have a far greater impact on the local eco-system than a power line. A road changes the flow of run off rain that has existed for centuries. In spite of these factors, the visual intrusion of the road does not appear to be a problem to game ranchers and tourists.

Their views were clear, certain requirements were needed for them to meet their objective. *“The road is essential for our business, because that is where our business is conducted on, because we focus on the experience”* (Respondent H). Here we have an interconnection between tourist, road, experience and one of the objectives of a game rancher, return on investment. I see this as a form of self sealing behaviour. From a tourist point of view, they are prepared to accept some form of visual intrusion if it is a means to an end. A road is acceptable and the drone of a vehicle engine is tolerable because it contributes to easy game viewing or hunting (Figure 4.4).

- Game Drive Vehicles

The continuous drone of the game drive vehicle is a totally foreign sound and yet it is acceptable. These game ranchers/reserves do not occupy vast tracks of land, therefore limiting the number of herbivores, which are based on carrying capacity. This limitation further restricts the number of carnivores, which are a key attraction for tourists. Considering cause and effect, the sighting of a cheetah, leopard or lion kill will attract numerous game drive vehicles. Personal experiences of interesting sightings in the Kruger National Park and images of lion kills in Serengeti often resemble a car park with the number of vehicles present. Respondent E remarked, *“we don’t want 15 vehicles at a cheetah kill”*, this comment is typical of a psychological contract, an individual or group view of how many vehicles are acceptable at a sighting. The following is an example of secondary information. *“Tourists would not accept a car on a game drive; it must be a typical game drive vehicle”* (Responded D). He ended off by saying, *“this is what we were filled in with when we started”*. This statement summed it up – it was hearsay. As in other interviews, if something is a means to an end it is acceptable. What needs to be understood (my perspective) regarding my comment, a means to an end, people are at these game ranches for game viewing and if there is something that contributes directly to game viewing it appears to be acceptable. i.e. access road or a game drive vehicle (Figure 4.4).

- Lodges

As with access roads and game drive vehicles, the lodge contributes to the experience. Thus, is accepted by tourists. The visual intrusion or the large foot print a Safari lodge creates is acceptable because it is a means to an end for a pleasurable bush experience (Figure 4.4).

4.3.3.6 Conclusion to mental models

One perspective of the metaphor, African experience, (section 4.3.3.2) is the perfect recipe for a trap. One is trapped because of a lack of thinking laterally. Perspectives can be extremely powerful in creating traps. A game rancher's perspective that tourists find power lines offensive and having a negative impact on their experience is sufficient to force him into a trap. Typical of a closed way of thinking, a kind of self sealing behaviour, preventing them from considering alternative views.

As illustrated by the Kanizsa triangles and the supporting text, I suspect this is what is happening in the minds of game ranchers and tourists when they think of an African experience (Figure 4.4). Images created from stories of early adventures coupled with current advertisements inviting tourists to come and experience an old Africa with luxury lodges, 4*4 game drive vehicles and access roads etc, these factors are used to construct mental models in the mind of tourists and game ranchers. The perspective of an old Africa that does not exist, and by portraying modern South Africa, or to be more specific, traditional stock farming areas as a safari destination for an old African experience is creating a false impression. It appears that feedback in whatever form it may be (ie development for infra-structure required for progress) reflecting the modern Africa we live in, is being dampened and feedback reinforcing the need for the old Africa is being amplified resulting in the trap form of thinking. I need to stress at the same time that I can understand why the old Africa is such a sought after goal, because part of the attraction to Africa is its mystery and mystique which people would like to experience. However, adopting multiple perspectives in the way we think, not just our own single perspective, could improve the situation.

According to The Open University (2000), T205: Concept File 2. Workplace and Self-development course material implies that, if something is consistent with your belief, you will tend to accept it. Taking this one step further as stated above, the mental model and the belief system appear to be co-dependent which confirms why certain objects, associated with the African experience are accepted (section 4.3.3.6) and others not. As far as the unnatural objects are concerned, luxury lodges, 4*4 game drive vehicles and access roads etc that contribute to an African experience, tourists do not question the use of these first world objects because they are features in the advertisements used to construct their mental models. This is in turn supported by the discussion in section 4.3.2.2, implying that content approaches focus more on the needs and incentives that influence people's behaviour. A term I have created to describe this behaviour is **acceptance by association**. In other words, if the object is contributing positively to your experience, then it is considered acceptable. All the feedback loops discussed above have positive needs and incentives for game ranches and tourists alike. They are essentially a means to an end. Hence, the motivational theories, mental models and the sign graph are all consistent with their predictions.

The fact that Addo Elephant National Park still has large environmental credence within the system indicates that development and eco tourism can co-exist and this needs to be recognised and possibly incorporated in to advertisements. A strategy could possibly be formulated to inform tourists of the previous land utilisation and the successes of combining conservation and first world technology. This was in fact mentioned by one of the respondents.

4.3.4 Property Value

The game ranchers, who catered for commercial hunting, were more tolerant towards power lines. This essentially applied to the existing lines, when questioned about new lines; they implied that the property value would drop, however this could not be substantiated. Collectively, the majority of the respondents felt that power lines would devalue game ranches (endorsed in Table 2.3). But as Respondent D admitted, "*there is no actual proof that values are affected*".

Applying a value to a game ranch using quantitative methods, ie carrying capacity per hectare, probably applies to stock farming or breeding of game. However, when the purpose is to offer tourists an African experience, then qualitative factors cannot be ignored.

4.3.4.1 Summary of property values

Although there is no concrete proof of the impact of power lines, my perspective is that value will depend on the criteria and needs of the buyer (endorsed in Table 2.3). If finance is not a problem and time is on your favour, the buyer will likely be more particular (pass up ranchers with power lines) than one who has limited funds and little time.

4.3.5 Rights of Way

4.3.5.1 Stakeholder Theory

As part of the literature review, I did extensive reading on stakeholder theory with particular focus on financial distribution. *“Rental is a preferred option for consideration”* (Respondent B). He felt this could even enhance the sale of a property because it is an additional income.

However, during the interviews, I soon realised that financial compensation for non consumptive eco-tourism organisations was not an option. Based on non-consumptive eco-tourism organisation respondents, there was no substitute for the negative impact of visual intrusion. Economics is a key factor in this industry. *“Any business is about profits, we can make far better profits if this money was invested in property in Port Elizabeth, so it is also about enjoyment and pleasure”*(Respondent I). The aim is *“high economic return, low density impact, we own it for a return; we do not own the property as a hobby”* (Respondent E).

Having said that there is no substitution for visual intrusion, I need to qualify this statement. Eskom would not be prepared to pay the consideration expected by game ranch owners. Based on the financial model used by Eskom to compensate owners for Rights of Way, qualitative factors take land value into account. To quantify the financial impact of visual intrusion would be virtually impossible. However, I do see a role that stakeholder theory can play in other sectors of the power line system, which is beyond the scope of this research.

4.3.5.2 Security and maintenance

I have combined security and maintenance because they are interconnected. I would classify this problem as a difficulty rather than a mess. To a degree they could be defined, unbundled and controlled. Surprisingly, these issues were a concern, but certainly not the high profile I assumed at the start of the research.

This is endorsed in Table 2.3 where only two stakeholders refer to maintenance and operational issues. They certainly are factors that contribute to power line objections, but in comparison to visual intrusion, are not as important.

The four main concerns were:

- Private contractors

Eskom makes use of private contractors to maintain the RoW. Unidentified employees or unmarked vehicles pose a problem for game ranchers. Stock theft is a major factor on rural properties. Consequently, strangers on farms are treated with suspicion until identified.

- Helicopters

This is not an issue to take lightly when elephants are involved. Helicopters are used extensively during game capture operations (mentioned in Table 2.3) to herd the animals into bomas. It could take “4-5 years” (Respondent B) for animals to become accustomed to helicopters. Helicopter patrols cause game to take fright, often running into fences and injuring or killing themselves. A herd of elephants breaking through a fence due to a helicopter, could result in a major operation to herd them back or sedate them and transport them back, endangering people’s lives in the process. This could end up a very costly exercise.

- Bush clearing

The concern here was for the unnecessary wide clearing required by Eskom. A cleared strip in this sub tropical thicket creates a scar visible for many kilometres.

- Dangerous animals

Most of the non-consumptive eco tourist operations had or were in the process of implementing a system to accommodate both parties. These organisations employ a number of rangers and it appears that allocating one on standby with maintenance teams, was not a problem. However, Respondent G, who owns a game ranch for his own enjoyment, does not have spare staff to stand guard during line patrol or fault repair. It must not be forgotten that faults can happen at any time of day or night.

4.3.5.3 Summary of Rights of Way

Processes and interventions are already in place to deal with these issues. The key to the success of this problem is open communication between parties on a regular basis.

4.4 EVALUATION

4.4.1 Overview

In conclusion, an ‘Impact’ evaluation is conducted to compare planned against actual execution of chapter 3. Typical evaluation approaches are used for this function.

Owen, J.M and Rogers, P.J. (1999: 54) defines five different evaluation forms, see Table 4.6.

Table 4.6: Evaluation Forms

| Evaluation forms | State of Program | Focus | Timing | Objective |
|-------------------------|-------------------------|---------------------------------|---------------------|--------------------------------------|
| • Proactive | None | Content | Before | Needs assessment |
| • Clarification | Development | All elements | During | Accreditation |
| • Interactive | Development | Delivery | During | Action research |
| • Monitoring | Settled | Delivery/outcomes | During | Systems analysis |
| • <i>Impact</i> | <i>Settled</i> | <i>Delivery/outcomes</i> | <i>After</i> | <i>Process & outcomes</i> |

The Impact evaluation form meets all the characteristics specified. Hence this will be utilised for the assessment.

Typical issues stated in the book for evaluation are:

- “*Has the program been implemented as planned in Chapter 3*”?
- “*Have the stated goals of Chapter 3 been achieved*”?
- “*Have the needs of the Researcher for the Dissertation been achieved*”?
- “*What are the unintended outcomes of the Dissertation*”?
- “*Does the implementation strategy lead to the intended outcomes*”?

The major approach will be “*process and outcomes studies*”, which involves “*determining outcomes and also measuring the degree of implementation of the program*”. (Owen & Rogers, 1999: 48)

4.4.2 Evaluation Areas

The following four areas will be evaluated as per Table 3.1, context, technology, coordination and results. The objective is to identify factors/perspectives listed in Table 3.1 appropriate to the research problems and the dissertation. These are listed in red in Table 3.1. Results will determine what quadrant is most applicable and whether the correct methodology or change facilitator was used (Section 3.5).

4.4.2.1 Context

- Micro and Macro level processes. The fact that the dissertation was “*inter-organisational*”, it could be defined as a “*macro processes*”. There are influencing “*external forces beyond the boundaries of the practice*” (Huntington as cited in Rhydderch, et al., 2004: 215). This increased the complexity of the situation.
- Environment - The trigger for change (resistance to power lines and associated behaviour) originated in the game ranching system which is an agent in Eskom’s environment. Typical of environmental changes, they can be beyond the organisation’s control and yet imposed on them. As an example, we can’t control the wind, but we can adjust the sails to compensate for it and receive the benefit, a win win situation.
- Open & closed feedback loops - The system of interest was a closed one consisting of events and patterns. Negative feedback was in the form of resistance to power lines, limiting or controlling access to game ranches, which in turn affected project objectives and outage ‘key performance indicators’, which in turn triggered an intervention (dissertation) to gain understanding of the situation. The outcomes of the dissertation could possibly be used to dampen the feedback and nudging it into a self regulating loop. The event was the behaviour towards power lines, while the pattern increased as new game ranches were developed. This was the trigger for change.
- Culture is a definite factor. game ranchers have their type of organisational culture, as does Eskom
- Communities and groups, and game ranchers are part of communities and groups.
- Economics is a contributing factor influencing game ranchers’ behaviour.

4.4.2.2 Technology

- Negotiation was part of the conception phase in establishing who, what, when, and how. The facilitator played a pivotal role in this phase.
- Facilitation was required by the researcher for the interviews. This entailed coordinating them, listening, reflecting, and asking questions.
- Collaborative inquiry - The interviews were instruments used to scan the environment for more perspectives, thereby creating a richer picture, a tool for sense making of the situation, in turn, obviously influencing my worldview. Having reflected on the discussions before and during the interviews, I unfortunately cannot recall having dampened or amplifying any feedback. This would confirm if I, as the facilitator, was biased in any way.
- Interest groups, this is covered in sections 4.4.2.1 and 4.4.2.3

4.4.2.3 Co-ordination

- Interrelated groups and alliances. The researcher and units of analysis (game ranchers), comprised a team, with co-operative alliances from both parties. The units of analysis, in turn, were members of groups interconnected by networks. Hence, I was using “*teamwork as a structure for change*” (Felkins, et al., 1993: 181)
- Feedback loops, are covered in section 4.4.2.1
- Communication, Interaction, Conversation, were the basis of the dissertation. The build-up and the format of the dissertation were intended to create a ‘safe space’ for all participants to speak openly and freely. Without knowing their minds, it was impossible to determine if participants were speaking frankly. However, at face value, it did appear to be the case. Communication was also used for fact finding to make sense of the situation.
- Roles were defined i.e. Researcher/interviewer and interviewee.
- Interpretation of the interviews/data was completed as required for the dissertation.
- Agreements were required for the interviews to take place.
- Shared understanding of the objective of the interviews was required. The assumption was, if the intension of the interviews was known, the game ranchers would probably share more freely and sincerely.

4.4.2.3.1 Results

- Understanding, Knowledge and improvement - understanding, gaining knowledge and improvement of the current situation are all objectives of the interviews.
- Relationships - although the interviews were very brief, a form of relationship briefly developed. However, I had previously interacted with seven of the nine respondents, therefore a relationship already existed.
- Unity was essential for the interviews; the aim was to create a safe space where respondents would share freely.
- Resource utilisation was a key factor for data assembly. The game ranchers were used as a resource to impart knowledge for analysis.
- Transformation was not required for this dissertation. However, in the long term it is required by game ranchers and Eskom for successful partnerships.
- Consensus, Commitment and Cooperation were all required for the interviews..
- Innovation is required to overcome the current game rancher / power line problems. Current processes and technology are not enough.
- Awareness of the consequences of one's behaviour is a possible starting point for transformation.

4.4.3 Evaluation Summary

- Has the program been implemented as planned and have the stated goals of Chapter 3 been achieved?

One on one unstructured interviews from a sample of five to ten game ranchers were planned. Nine were actually interviewed, meeting the requirement.

- Was the Organisational approach as defined in section 3.6.3 and the suggested elements in Table 3.1 valid?

All of the suggested elements were to a greater or lesser degree applicable, supporting the interpretive approach.

- Have the needs of the Researcher for the Dissertation been achieved?

The data was summarised, analysed and interpreted as planned.

Based on the above summary, it appears that the design and methodology was executed according to plan and has achieved its objectives.

5 CONCLUSION

5.1 OVERVIEW

As stated in Chapter 1, the purpose of this study is to identify possible root causes of the resistance to power lines by game ranchers and where possible recommend solutions, for the purpose of improving Rights of Way acquisition. To achieve this, four focus areas have been considered (Figure 2.2):

Table 5.1: Focus Areas

| Focus Areas | Key Research Questions |
|---------------------------|--|
| Stakeholder Holder Theory | <ul style="list-style-type: none"> • How should Eskom compensate game ranchers? |
| The Natural Environment | <ul style="list-style-type: none"> • Must the natural environment pay its way? |
| Rights of Way | <ul style="list-style-type: none"> • Do power lines increase security risk? • Is maintenance and management of Eskom Distribution power lines and RoW a problem? |
| Visual intrusion | <ul style="list-style-type: none"> • What impacts do power lines have on game ranches? • What impact do other un-natural objects (game drives roads, vehicles, lodges) game ranches? • Do power lines devalue property? |

NB. The above are not listed in order of priority.

The scope of the project was to conduct unstructured interviews with five to ten game ranchers or their appointed representatives within the Eastern Cape. An interview schedule was compiled with specific questions considered appropriate to surfacing underlying assumptions.

Other areas to be covered in this concluding chapter are:

- How this data adds new knowledge to the theoretical work done in Chapter 2.
- How this new knowledge might be useful to myself and to others.
- Reflect on my learning experience in doing the research.

5.1.1 Stakeholder Theory

A large percentage of chapter 2 consists of Stakeholder Theory. The reason for this is firstly, due to the importance of stakeholders and the function they perform (see Figure 2.15) in Eskom's Electrical Distribution System. Secondly, to gain knowledge on this vital component of the system, as this will enable Eskom to respond to them in the appropriate manner. The land owner is the most important stakeholder in the overhead power line environment. As can be seen in Figure 2.15, there are a number of basic requirements that need to be in place to construct a power line. Without the land and the RoW to construct and maintain the asset, there would be no power line. Clearly, this indicates the importance of the land owner as a stakeholder due to the dependency just mentioned. The literature contributed extensively to my understanding of stakeholder theory and the expectations of stakeholders, specifically in the distribution of income generated due to partnerships. This knowledge can certainly be used to influence Eskom's policies and procedures in the structuring of their financial model with regards to the payment of consideration to property owners. However, stakeholder theory is based on expectancy, each one expecting their fair share of the deal and in the case of game ranchers, the expectancy is no visual intrusion caused by power lines. Uninterrupted views of the African bush veld are their goal. To the game rancher, a lack of power lines equates to an increase in income and vice versa. Therefore, in summary, regarding stakeholder theory, my understanding was expanded to a large degree, but unfortunately it is not practical to meet game ranchers expectations. Underground cables are just too costly (as much as twenty times more than power lines) which would make electricity not cost effective.

5.1.2 The Natural Environment

The purpose of this chapter was to obtain an understanding of the natural environment as a stakeholder and how game ranchers and Eskom recognize it as one. Clearly it is, although according to the definition of a stakeholder in stakeholder theory, it does not meet the requirements. Most forms of development will have a negative impact to a larger or lesser degree, including power lines and game ranching. The perception, however, is that game ranching has only positive effects on the natural environment. It does have positive effects, and cannot be disputed.

Reintroducing game to their natural environment in areas where they vanished due to human pressure is essentially restoring it back to its original purpose. However, there is a condition, and that is that it must pay its way. There is nothing wrong with this, as long as the benefits far outweigh the negatives. But game ranchers need to be aware that their own practices, i.e. luxury game lodges and the large foot prints they create due to infrastructure, services, water and waste that are required or bi-products generated all have negative impacts and not only power lines. In fact power lines have very little impact on the natural environment. In places where burning of wood for energy to cook meals is required, the introduction of electricity has reduced the need to cut trees for firewood, thus increasing the chances of survival of the vegetation, which improves the natural environment. The literature in chapter 2 on rain forests and other sensitive areas demonstrates measures that can be implemented to limit impacts to the natural environment. In summary, my perspective is that the natural environment is viewed as a resource to be used for the purpose of personal gain. This is consistent with the literature reviewed. The fact that human needs will generally be placed before environmental needs, it is important that legislation exists to protect the environment. It is also important that legislation is not made by policy makers, but by all stakeholders to avoid its politicisation.

5.1.3 Rights of Way

At the time of doing this dissertation, processes were being implemented to deal with issues regarding maintenance of the lines. The process began with the non-consumptive eco tourist reserves. Hence, during the interviews, non-consumptive eco tourist reserves were satisfied that the issues could be managed, while there were still concerns with the game/stock rancher respondents. However, I assume the same positive response from them as experienced by the non-consumptive eco tourist reserves.

My perspective on this issue is that relationships between stakeholders, in this case, Eskom and Game Farmers, needs to be maintained, nurtured and developed. This relationship, however, that you have may not be adequate tomorrow. Relationships and circumstances are not mutually exclusive, as stakeholders situations change or evolve so that the relationship needs to change and evolve. This clearly did not happen when stock farmers converted to game ranching. Eskom continued with the original relationship, applying the same conditions.

However, in the field the situation had changed. The game rancher expected Eskom to understand and adapt. Consequently, pure lack of communication due to an inadequate relationship was the result.

5.1.4 Visual intrusion

As I began the interviews, I realized that this issue overshadowed all other issues. This was the core issue and amongst some, the only issue (endorsed in Table 2.3). As revealed in the literature review, due to the imposing nature of power lines, the resistance to them is becoming a global trend. It is just more prominent in areas where the aim of the experience is meant to resemble an undeveloped area. The concern here is that there are no immediate solutions. If a proposed power line intersects a game ranch, it generally reflects the preferred route and any other routes would probably increase costs due to extended lengths or possibly difficult terrain.

The reality is that game ranching is on the increase while an increasing demand for electricity is driving the need to construct more power lines. Therefore, there is a need to do further research in this field to identify possible solutions, with special reference to visual intrusion and its impacts on tourism. This could contribute to finding possible solutions. At the moment, it is all speculation with regards to the tourist's perception of power lines and the African experience. Once the true impacts are discovered, only then could strategies be implemented. For example, if the study proves that power lines do not have a negative impact on tourism, then there would be no need to spend large sums of additional money (which ultimately is recovered from the consumers) avoiding them. Added to this, the game rancher would have peace of mind and would not live in fear of having a power line constructed across his property at the risk of destroying his livelihood.

However, in saying this, game ranchers' views of power lines and their associated impact are classic worldviews. These worldviews are so deeply embedded in the subconscious that one wonders if the outcome of a single study would be adequate convincing.

However, the reader needs to be reminded that in some instances, as covered in section 2.4.4.8 & 2.4.4.9, the concern and effort taken to limit damage to the natural environment has been far greater than the concern for visual intrusion. Specifically, where towers were designed to enable the conductors to span above the tree tops, the power line was very visible. The difference in this case is that the land would be state owned.

5.2 REFLECTING ON MY LEARNING EXPERIENCE WHILE DOING THE RESEARCH

As far as the scope of the study is concerned, maybe I should have been more specific and only focused on one area of game ranching, ie non consumptive eco tourism section. The reason for saying this is the interviews revealed definite variations in priorities between game ranchers that offered commercial hunting and the non consumptive eco tourist organisations. The game rancher who offered commercial hunting invariably combined this with traditional stock farming. Stock farming demands a certain infrastructure i.e. fences and kraals, that would remind tourists or hunters that they are not in Darkest Africa. Therefore, although they would prefer not to have power lines, visual intrusion did not carry the same weight as the non-consumptive eco tourist's organisations.

As I approached the final stages of the dissertation, and I began to reflect more and more on the contents, I created links within the dissertation. More insights were revealed and more connections became evident. Although my knowledge of the topic increased rapidly during the early compilation stages, it continues to increase as I re-read and reflect on the contents. Systems theory has taught me to view issues from multiple perspectives. The quote 'cause and effect is not always proportional, hence, non-linear by nature and very often distant in time and space', has resulted in root causes previously thought to be totally unrelated to the symptom, now being investigated. Mental models and motivational theories have improved my understanding of many issues in my environment. In conclusion, the whole project; the Course and the Dissertation have been a wonderful learning experience.

5.3 LIMITATIONS OF THE STUDY

- A limitation of the study, due to time constraints, is that this research involved a small percentage of game ranchers in the Eastern Cape and there are many others out there who could have totally different views.
- The practitioner is part of and has a huge influence on the research, therefore perspectives tend to be rather subjective.

5.4 FURTHER RESEARCH

- Research the visual impact of power lines on tourism.
- Research the possible link between personal motivation and perspectives.

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APPENDICES

INTERVIEW SCHEDULE

Equipment required

- Map of area indicating power lines
- Interview schedule
- Tape recorder, cassettes, batteries, extension lead
- Note book and pen

Introduction (ice breaker)

- Purpose of interview
- Game rancher to ask questions, clarify any issues
- Brief history of yourself and interests

Visual intrusion

General

- How do power lines impact your game ranch?
- What is your objective in game ranching?
- Is your concern with the impact power lines have on the environment or on tourists?
- Is Nature not best left alone, with no human interference?

Non-Power Line Impacts

- What other un-natural objects do you have on the property?
- How do the following affect visual intrusion?
- How do the following affect the natural environment?
 - Access roads
 - Game drive vehicles
 - Windmills
 - Fences
 - Lodges
 - Domestic stock (hunting operations)
- Why do people accept them?

Converted or Purchased

- Why have you converted to game ranching?
- Why have you chosen this area?
- What are the key factors you considered when buying a game ranch?
- When you bought your farm did you consider the power lines?
- If you did, did it influence your price?
- Do established game ranches create a climate for establishment of new ones?

Tourism

- Do tourists / hunters complain about the lines?
 - If yes give example
- Do you have the same tourists each year?
- Have any tourists not returned due to power lines?

Property values

- How do power lines affect property values?
 - If yes, give an example

Rights of Way

Security

- How does third party agreements impact your operation?

Maintenance of lines

- What are the impacts regarding dangerous game and maintenance teams working 24 hours a day?
- What impacts do cleared servitudes have?

Rights of Way

- Succession in title
 - Transferring of rights
 - Raising awareness of RoW
- Consideration
 - Is it acceptable?
 - What are the alternatives?
- Is a power line that runs along a boundary and is visible acceptable?
- Does the visual intrusion factor diminish as the line is placed closer to the boundary of the property?
- Preferred position of line
 - On the ridge?
 - Side of ridge?
 - Valley floor?

Perception of Eskom

- Does Eskom care about the environment?
- Do you trust Eskom to construct power lines in an environmentally and responsible manner?

Solutions and suggestions

- Alternative solutions?