



**Cape Peninsula
University of Technology**

**Relationship-building between communities and astronomical observatories in
South Africa**

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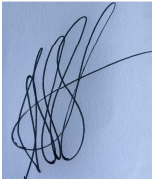
07 December 2021

Supervisor: Prof Nic Theo

DECLARATION

I, Thembela Mantungwa (student number: 197008186) declare that the dissertation submitted for the qualification, Master's Degree in Public Relations is my own work and I have not submitted the same work previously for a qualification at a university.

I further relinquish the copyright of this dissertation to the Cape Peninsula University of Technology.

A handwritten signature in black ink, appearing to be 'Thembela Mantungwa', is shown within a blue rectangular box.

Thembela Mantungwa

DEDICATION

I dedicate this dissertation to my father, who would have been so proud of me. I do not know how many times I thought of calling and sharing what I was going through while working on this dissertation. I wish you had stayed longer for these conversations. You are loved and missed immensely, especially in moments like this one. In E.E. Cummings words "I carry you in my heart."

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The topic of my dissertation has reminded me of the importance of maintaining relationships with family, friends, and extended family members. Central to keeping in touch is the realisation that we each depend on the other for this or that, as such without these ties we cease to realise our full potential. Our being is exactly like a merry-go-round, without the hand-holding the circle doesn't move in a synchronised manner.

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Chapter 1:

1. Introduction and Context of Research

To limit hindrances caused by humans such as light pollution and radio interference, Astronomical Observatories around the world are located in remote and sparsely populated areas. The South African Government through the Department of Science and Innovation (DSI) has enacted an Astronomy Geographic Advantage Act (AGA) for the Northern Cape (Gazette, 2008:16) to guard against such intrusions. Sutherland where the South African Astronomical Observatory research telescopes are located falls within this Astronomical Geographic Advantage in the Northern Cape.

The South African Astronomical Observatory (SAAO) has its headquarters in Observatory, Cape Town where the original scientific institution, the Royal Observatory Cape of Good Hope was founded on 20 October 1820 by an Order in Council of His Majesty King George IV (Warner, 1979: 2). The Royal Observatory Cape of Good Hope was succeeded by what is known today as the South African Astronomical Observatory (SAAO), an amalgamation of two Observatories, the Republic Observatory in Johannesburg and the Royal Observatory Cape of Good Hope (Glass, 2015:4).

Light and air pollution became an affliction to astronomy around the mid-20th century, resulting in a search for clearer, darker skies. Such a location was founded in the semi-desert Karoo town of Sutherland mid-1972, where after official observations began in Sutherland subsequent to the newly formed South African Astronomical Observatory (Glass, 2015:62-63). Today, the SAAO research telescopes are located on the plateau in Sutherland, Northern Cape (Warner, 1979:123). Upon establishment, the main function of the Royal Observatory Cape of Good Hope was to map the southern skies as well as providing crucial time signals required for maritime navigation (Glass, 2015:2).

Nowadays, the administrative headquarters, computing facilities, engineering workshops, the national library for astronomy and space sciences are still located at the historic Royal Observatory Cape of Good Hope site in Cape Town. Historic astronomical instruments, including the noon pistol, are on display in a small museum

in the old laboratory of the 0.6-m McClean telescopes. Even today, the SAAO sends the time signal to Signal Hill at noon.

1.1 Moving Telescopes to Sutherland

When the Observatory was established in Sutherland, Prime Minister B.J. Vorster had a desire for South Africa to develop astronomy and astrophysics interest, his belief was, research in abstract science was healthy and vital to the progress of South African universities. He then affirmed that South Africa had already entered into an “agreement with an overseas agency, the Science Research Council, and we are most anxious to encourage overseas astronomers to come here to work because we believe that the presence of men of the highest scientific eminence, such as our guests today, is of utmost benefit not only to astronomy but to all other sciences and to the universities and to the nation as a whole.” (CSIR, 1973:12).

In 2005, a time considered a turning point in South African astronomy, a large single optical telescope, the Southern African Large Telescope (SALT) was commissioned in Sutherland in the Northern Cape. Astronomy outreach (science communication) was intensified to justify the huge investment in an instrument of this magnitude (SAAO, 2021). The South African Astronomical Observatory created an astronomy outreach department to interface with schools and the general public of South Africa. The function of the outreach department remains mainly streamlined towards school interventions, astronomy public awareness, and promotion of astronomy careers for posterity (SAAO, 2021).

Considering the international nature of the discipline of astronomy, astronomy outreach may have been pre-emptive from the SAAO or a trend picked up from the 2004 European Union report, which had noted diminishing enrolment numbers in science fields necessitating more outreach efforts (Dang & Russo, 2015:1). On the other hand, the Department of Science and Innovation in its Science Engagement Strategy articulates the importance of scientific literacy as the cornerstone for the maintenance and expansion of national systems to enhance the attractiveness of science as a career and as a social knowledge system (Department of Science and Innovation, 2015:6).

To emphasise the country's position on science engagement and outreach, the 10 November 2005 speech delivered by President Thabo Mbeki at the inauguration of the Southern African Large Telescope in Sutherland, also carried a message of science and society engagement, "The observatory is a place dedicated to the pursuit of knowledge. Its sole purpose is the discovery of the unknown, and therefore the further liberation of humanity from blind action informed by superstition that derives from failure to fathom the regularities and imperatives of the infinite natural world" (Polity, 2005:2). Contained in Mbeki's statement is a quest for knowledge to empower humanity to engage meaningfully with scientific knowledge. The question of meaning-making then becomes imperative in relationship building, especially in a country where political prying and censorship ran rampant during the Apartheid era (1948-1993) with science perceived as a political weapon with negligible concern for public accountability (Joubert & Mkansi, 2020:772).

Since the SAAO is a facility of the National Research Foundation (NRF), the addition of astronomy outreach to the SAAO operations supports the NRF mandate of raising public awareness of science as well as community engagement (NRF, 2019). To realise the hopes and aspirations of a nation trying to define its place in science, President Thabo Mbeki's speech further expressed the importance of the Southern African Large Telescope in demystifying science, and that humanity would benefit from the establishment of a complex of astronomical facilities in Southern Africa and Africa (Polity, 2005:2), which has become a reality upon South Africa winning the bid to host the Square Kilometre Array (SKA). The project extends to other African countries like, Botswana, Ghana, Kenya, Madagascar, Mauritius, Mozambique, Namibia and Zambia (SKASouthAfrica, 2021).

Similarly, the Science Engagement Strategy underscores a need for an enabling environment where science and technology serves that society and allows citizens opportunities to engage and debate around issues of public interest that are scientifically intricate (Department of Science and Innovation, 2015:6). As a result of intentional astronomy outreach, a step forward for the SAAO, stakeholder inclusion formed an important aspect of business operations giving the astronomical observatory a social licence to operate as articulated by the King Report III (IOD, 8:2009). Looking back at the dawn of our democracy, the South African Government

from 1994 has been making strides in advocating for science and society. The South African Department of Arts and Culture, Science and Technology in its White Paper asserts the resolve to develop a South African vision of information society that would serve the country's needs instead of ricocheting other countries views (Department of Arts Culture Science and Technology, 1996:15). Thus the South African King Report III views on corporate governance are not in isolation in their advocacy for organisational accountability to stakeholders.

1.1.2 A trajectory of science and society in South Africa

The position of science within society in South Africa is defined by a tumultuous history, first the colonial conquest, then the apartheid regime. The latter period was characterised by secretive research, using science as a political weapon to control society and to muzzle journalists who would dare talk about scientific matters considered out of kilter with the National Party, whereas the former used science to defeat and pacify Africa during their reign, which lasted until the 20th century (Joubert & Mkansi, 2020:772). Since the 1800's till 1994 astronomy has no recorded history of societal benefits except universally, the study of the cosmos has always been an object of fascination with no human purview. Consequently, the 19th and 20th centuries meant that the Royal Observatory Cape of Good Hope was controlled from London by colonial masters for two decades (Dubow, 2018:664). Although research was a hive of activity in South Africa, the colonial period brought with it social disruptions to the early African societies science and technology resulting in the loss of essential elements of culture. These practices are evident in archaeology where ancestral abilities in prospecting and tool-making are remarkably demonstrated (Boshoff et al., 2000 in Joubert & Mkansi, 2020: 771).

Patrick Harries mentions how the 1875 Encyclopedia Britannica wrote about Africa as "until recently one of the least known....great divisions of the globe", which later led to huge amounts of information churned by European missionaries, scientists and traders. From this group, a colourful way of looking at Africa emerged then later replaced and overtaken by a more modern gaze influencing the unfolding discipline of anthropology. The modern anthropologists' style of writing was not centred around the subjects being observed rather they were aimed at popular readership interlacing random sightings and indiscriminate observations of local people coupled with

personalised stories. In comparison, the early anthropologists tried to position indigenous people at the centre of their concerns (Harries, 2000:11). Under apartheid indigenous knowledge systems and practitioners within the system were slighted, subdued and greeted with derision. Yet the role of indigenous knowledge in transformation of the pharmaceutical industry is illustrious (DST, 2004:7-15). One thus could argue indigenous knowledge systems could have developed at the same pace as modern scientific research had it not been for these interruptions and contempt with which this knowledge was treated. African people have for instance used the night sky for rituals and agricultural purposes (Laney, 1998:1-2) and they continue to rely on this calendric system even today. The discovery of gold and diamond from 1865-1875 changed the grounding of science operations in South Africa. The professions necessary for industrialisation had to be brought over from Europe, then scientific employment became a reality (Boshoff, et al., 2000:9).

Since 1994, the democratically elected government has been trying to strategically locate science within society through its policies. The national vision for information society attempts to ensure the creation of a fair information order nationally and regionally, considering the unquestionable potential of communities at different levels to work together to eliminate differences and achieve mutual upliftment as well as address basic needs and equalise disproportionate social development (Department of Arts Culture Science and Technology, 1996:16). Quite a transition from a time when science was the preserve of the few with some science institutions in the country playing a pivotal role in promoting white Afrikaaner identity (Dubow, 2010:274-275). The inclusion of outreach or science awareness is viewed by the current government as a way to help correct past inequities to improve socioeconomic growth, hence the science engagement agenda within all the national science institutions (NRF, 2019:2). Science engagement is designed to ensure that the information revolution benefits society as a whole.

Arguably, a fully-fledged attitude to public communication of science should aim to use science, not as a tool to exert authority over non-scientific communities. Rather, the approach should seek to understand cultural norms and seek social cohesion. An authoritative approach may cause friction ending up in apprehension of science within communities. Science communication can be used as a conduit between science and the everyday challenges of life (Manzini, 2003:193). Understanding the difference in

approaches between science and society, the Science and Technology White Paper provides for collaborative partnerships and interactions to benefit the nation (Department of Arts Culture Science and Technology, 1996:5).

In South Africa, the Department of Science and Technology funds many programs geared towards improving scientific literacy and awareness. Through the agencies that fall within their jurisdiction, they have executed a lot of outreach or science engagement initiative across all science and technology spheres (Department of Science and Innovation, 2015:6). The forerunner of all these events is the 1998 “year of science and technology”, a campaign that was considered a “wake up call for South Africans” (Department of Arts Culture Science and Technology, 1998). This campaign gave birth to the annual national science week that began as schools intervention and has recently become more public-focused.

When the Southern African Large Telescope (SALT) was built, Sutherland was poised to become a centre for science, technology, and development which was signified by how accessible the Observatory was going to be to the public – complete access through tours and stargazing. This type of edu-tourism was to play a pivotal role in public understanding and engagement with science (Ingle, 2010:97), and serve as an economic buttress for the community owing to the considerations of tourism in South Africa and worldwide as a catalyst for development linked to job creation (Kontsiwe & Visser, 2019:1335).

A relationship between science and society is not firmly established in South Africa, given what du Plessis attributes to entrenched social segregation as a result of colonial and apartheid political systems that imported a westernised science culture leading to the disregard of an inclusive approach to science communication (du Plessis, 2017:1). Science communication is defined as the application of suitable skills, media, activities, and dialogue to provide a single or multiple personal responses to science, like, awareness, enjoyment, interest, opinion-forming, and understanding (Burns, et al., 2003:183). The dialogue is usually facilitated by corporate communication as a management function that provides a framework for successful coordination of internal and external communication with the overall intent of creating and sustaining beneficial reputations with stakeholder groups upon which the organisation is reliant (Cornelissen, 2020:5). Also, the role of public relations as a strategic organisational

function is acknowledged for boundary-spanning and its responsibility in communication engagement with various stakeholders in ways that facilitate social relationships, co-creation, and communication. It is this perspective that reinforces the claim that social license and social impact have value for public relations theory, as organisational decisions impact communities whether intended or unintended. This view additionally accentuates the need for organisations to devise better ways to understand and deal with public expectations in an authentic manner (Hurst & Johnston, 2021:1).

Consequently, communication represents a formative foundation that sets up a platform from which relationships can be defined and disassembled. Coming out of communication is relational culture, where a privately managed conversation and clarity synchronises attitudes, actions, and identities of partners in a relationship (Wood, 2009:75). As a relational concept, reputation forms, and reforms through stakeholder relationships as well as interactions. Managing perceptions linked with stakeholders is essential to managing reputations. Both brand and reputation are dependent on strategic communication to fashion people's perception with similar goals of ensuring that target groups view the organisation and its offerings in good light- this link entails that harm to one can weaken the other (Shams, 2015:314-316). Van Riel (1995:142 in Steyn: 2000:2) outlines the purpose of corporate communications as a consolidated approach to all communication generated by an organisation aimed at the desired groups. Likewise, the development of a corporate communications strategy benefits the organisation in dealing with issues affecting its stakeholders. Within the corporate communications strategy is a detailed list of all stakeholders and their functionality within the organisation, and the issues that may arise should the stakeholders not be addressed, accordingly, the benefits for both are also highlighted (Steyn & Puth, 2000b:66).

1.2 Research questions

Introduction

The purpose of the Department of Science and Innovation (DSI) Science Engagement Strategy (2015) is to advance science engagement in South Africa to boost the planning of engagement activities and to encourage science promotion and

communication across all entities inside the DSI and other organisations within the public sector (Department of Science and Innovation, 2015:3). Science journalist, Sarah Wild in her book “Searching African Skies” argues that big telescopes alone cannot solve the complex problems tormenting rural small towns located near big telescopes because rural problems in the country encapsulate greater societal problems specific to South Africa (Wild, 2012:135).

However, the DSI acknowledges that its strategy is “strongly informed by the values of contemporary post-apartheid South Africa” most definitely the essence of empowering its citizens to engage with processes and issues that affect them (Department of Science and Innovation, 2015:3). Furthermore, Manxoyi says, the construction of the Southern African Large Telescope (SALT) and its current operational phase have steadily made efforts to improve industrial, public awareness, education and socioeconomic benefits for the Southern African people, notably the residents of the Karoo Hoogland areas consisting of these small towns, Sutherland, Fraserburg and Calvinia (Manxoyi, 2016:35). Manzini opines that public communication of science constitutes cross-cultural endeavour where a gap has to be closed between the science culture and social culture of the public being engaged. The triumph of communication rests in the successful negotiation of the gap by the public (Manzini, 2003:192). The DSI lists four objectives as the cornerstone of the science engagement strategy, third objective is premised on advancing science communication that will heighten science engagement, acknowledging that effective science communication plays a pivotal role in science engagement (Department of Science and Innovation, 2015:3). With this view it should be expected that there would be curiosity in understanding how an Observatory located so close to the Sutherland community forges and nurtures relations with this community using science engagement as a foundational bridge and public relations management processes to maintain dialogue. With this backdrop this study aims to answer the following questions:

The main research question explores: What kinds of relational-management practices exist between the Observatory and the Sutherland community, to understand the importance of involving surrounding communities in science and community

engagement using the public relations management process to establish relations and mutuality

Sub-questions:

- What is the nature of the relationship between the South African Astronomical Observatory and the community around their research telescopes specifically from the notion of the Observatory's stakeholder management plan?
- What does the Sutherland community know about the Observatory, and how would they like to become involved?
- Why is the relationship between the Observatory and its immediate surrounding community important and critical in the process of strategic public relations in relation to reputation management and branding?

1.2.1 Research Rationale for the study

The Sutherland town hosts the South African Astronomical Observatory research telescopes, as such, the community hosts the major operations of the SAAO. Some of the administrative staff who work at the Observatory come from the Sutherland community. Many tourism businesses are thought to have come into existence as a result of the building of the Southern African Large Telescope (Jacobs, et al., 2020:4-5). The Observatory at the moment features in all tourism publications as the premier tourist attraction for Sutherland, and is on occasion considered the “stargazing capital” owing to the dark skies hence the new niche “Astro-tourism.” According to Jacobs et al., the building of SALT has brought an influx of academics, and tourists which had a positive influence on the livelihoods of the local residents of Sutherland (2020:90).

Through financial support from the Department of Science and Technology, Sutherland was gifted a community development centre, which serves as an internet hub, after-hours library, and reading centre for the community (Manxoyi, 2016:35). Most of the programs that are done at this community centre are school and education-based, led by the Observatory and the community serves as recipients. This is contrary to the rights and interests due to stakeholders for good corporate governance to avoid flare-up of issues (de Beer & Rensburg, 2014:212). The activities are focused on what the Observatory provides to the community.

Suitably managed stakeholder relationships yield positive stakeholder perceptions. The relational nature of reputation is bestowed on organisations based on how

stakeholders perceive their social relevance and differentiation through authenticity (Riad Shams, 2015:316). Organisations are not self-governing entities with limitless freedom to fulfil their goals, rather they rely upon relationships with stakeholders who assist them in defining what affects the favourable outcomes of the organisation's strategic decisions and behaviours (Grunig et.al in (de Beer & Rensburg, 2014:214). While there is a wealth of research and knowledge about the cosmos, what has not been explored in South Africa is how South African Astronomical Observatory has optimised its involvement through stakeholder engagement as well as stakeholder relations with external (enabling) stakeholders, like the community in Sutherland, who give legitimacy to their function for sustainability.

What is considered socially responsible and perhaps sustainable for the SAAO at the moment is the schools outreach program done nationwide and in Sutherland. While this is noble and very important work, it is not apparent how the community and the Observatory engage outside of school interventions and the community development centre. The corporate communication socialisation of stakeholders into the organisational culture allows for creation of meaning. Organisations could facilitate the formation of mutuality as well as legitimacy to shape long-term relationships that fashion the organisation's image and reputation (Mohamad & AbuBakar, 2018:242). In this regard, legitimacy can be obtained from establishing strong lasting relationships that are essential for observatories to achieve stakeholder support (Steyn, 2000:2). Ultimately, stakeholder legitimacy germinates from the need to stay relevant and competitive on the strength of reputation and issues management.

Against this backdrop, the study investigates stakeholder perceptions and expectations of the Sutherland community and what role the observatory plays in developing relations for brand and reputation competitiveness. Given that the function of public relations outwardly is to strengthen public trust in, and to achieve social acceptance for the organisation as well as obtain greater understanding in the public spheres where the organisation needs to be in contact (Steyn & de Beer, 2011:10).

1.3 Research Problem

Astronomy research is a well-known feat in South Africa attributed to almost two hundred years (Warner, 1979:1), what is not known and has not been studied thus far are perceptions as well as expectations of the Sutherland stakeholders who have been

neighbours of the South African Astronomical Observatory since the first observations in 1967 (Warner, 1979:123). The Northern Cape Province is home to two National Research Foundation managed astronomy facilities, namely, the South African Astronomical Observatory in Sutherland and South African Radio Astronomy Observatory. The proliferation of telescopes in this province sparks curiosity about stakeholders and how they are affected by the presence of these research facilities.

It is clear though that astronomy outreach in the form of science communication at schools and universities take centre stage (Observatory S. A., 2019), what is not apparent is what communities who are not school-going or university aspirant students think of the existence of the Observatory in their immediate surroundings and what they expect of it. Moreover, whether there is a relationship or engagement beyond school and university science engagement.

Steyn (2002) argues that the strategic role of public relations is to help organisations adjust to their societal and stakeholder environment by mapping stakeholders according to their importance and priority, in order for the organisation to meet stakeholder expectations. Strategic public relations also persuades organisational leaders to address reputation threats identified, by working to achieve proper alignment of organisational goals and strategies directed at stakeholder values, as well as norms mutually serving the organisation and public interest (in Steyn, 2007:3). Mutual alignment of values means understanding the essential role played by strategic stakeholders for organisations to realise their mission.

It is therefore important for organisations to develop an inclusive stakeholder relationship strategy for them to enjoy amicable relations with stakeholder groups especially those that provide functionality to the organisation's output (Steyn & Puth, 2000b:65). Currently, however, little is known about stakeholder relationship between the South African Astronomical Observatory and the Sutherland, a town whose community is located 15 kilometres away from the Observatory where research telescopes are located. The study seeks to understand the stakeholder perceptions of the Sutherland community.

1.4 Significance and Relevance of the Study

The study reveals the current state of stakeholder engagement and relationships between the South African Astronomical Observatory and the Sutherland community. Similarly, it brings an insight on stakeholder perceptions, which might enrich the work conducted by the Observatory and perhaps other organisations with similar remote operations.

Since good stakeholder relationship results in positive reputation and shared values, the data will advance knowledge that supports the need for good stakeholder engagement and sustainability. Furthermore, the study may help communities to actively take their societal role of keeping organisations accountable, seriously.

The findings will benefit public relations practices and the processes of stakeholder management more broadly by providing information on how remote community relationships and stakeholder engagement should ideally be handled. Currently, there is no literature indicating stakeholder engagement, management and relational communication linked to astronomical observatories, specifically. Given the burgeoning number of telescopes in the Northern Cape, the study will shed light on what role scientific institutions should play in stakeholder management.

1.5 Research Aims

The study is investigating perceptions of the Sutherland community about the Observatory with a view to understanding the extent to which the Observatory engages with its major external stakeholder - the community located 15 kilometres away from the hub of scientific research. Using the lens of the strategic role of public relations as the support for organisations to adjust to their societal and stakeholder environment. The objectives of the study are:

- To investigate community perceptions about the astronomical observatory (SAAO)
- To explore the nature of stakeholder engagement/communication that currently exists between the astronomical observatory and the Sutherland community
- To understand if a collaborative relationship could be established between the astronomical observatory and the community around it.

1.6 Research Design

The study makes use of a qualitative research design that seeks to understand and explore the current stakeholder relationships and perceptions about the South African Astronomical Observatory from the perspective of the Sutherland community. Qualitative investigations foreground meanings that are less detectable while also attempting to uncover the intricacies of our social world. In so doing, they explore 'what' 'why', and 'how' questions contrary to quantitative studies (Tuffour, 2017:1).

The research model adopted for the study is the interpretative phenomenological analysis (IPA) framework, which is a method relating to capturing individual accounts and reflections to explore and interpret the meaning attached while making sense of them (Ritchie, et al., 2013).

1.7 Theoretical Framework

The study uses the dialogic theory, which is a concept borrowed from philosophy and relational communication. Its inclusion in public relations is critical towards understanding how organisations can cultivate relationships that mutually serve organisations and public interests (Kent & Taylor, 2002:21). Steyn and Niemann (2014) assert the importance of societal adaptation by organisations to meet stakeholder expectations, values and norms to maintain good reputation. Therefore, there should be a strategy for each stakeholder group Wheeler & Sillanpää (in Steyn, 2002).

Steyn and de Beer argue that, the public relations function externally is to reinforce public trust and to achieve a socially responsible image for the organisation while also attaining greater understanding and support in the public spheres where the organisation needs to be in contact (2011:10). Equally, the reflective public relations function is evident in the feedback loop between society and the organisation through the two-way symmetrical communication approach (Steyn & Beer, 2011:11).

1.8 Assumptions and Limitations

The limitation is language, most of the people who live in Sutherland are Afrikaans therefore some struggled at time to articulate themselves in English. This difficulty

made some participants' responses less elaborate. Also some wanted to be assured that it was acceptable for them to be honest when responding to the interview questions. Also, the interpretive phenomenological analysis uses small samples for data collection, as such the study cannot be generalised. The literature review makes provision for issues management since stakeholder consideration comes with anticipation of strategic management, the corporate communication strategy also has a section in the situation analysis (SWOT analysis).

1.9 Definition of Terms

1.9.1 Stakeholder

Stakeholders are groups without whom the organisation would not exist. As such, it is crucial for organisations to understand how their operations fit into the environment, how business connects with the environment in its standard operating procedures as well as routine management processes. Also, organisations should consider how they carry out business transactions with groups who have a stake (Freeman, 2015:1)

1.9.2 Stakeholder Theory

Stakeholder theory advances a practical, methodical, effective, and ethical way of managing organisations in a highly difficult and unstable environment. The effectiveness of the theory is evident in the harnessed energy of stakeholders towards the attainment of organisation's objectives (Harrison, et al., 2015:859).

1.9.3 Corporate Communication

Corporate communication is a management function that provides a framework for successful coordination of internal and external communication with the overall intent of creating and sustaining beneficial reputations with stakeholder groups upon which the organisation is reliant (Cornelissen, 2020:5).

1.9.4 Public Relations

The role of public relations is to outwardly strengthen public trust, and achieve social acceptance for the organisation as well as attain greater understanding and support in those public spheres where the organisation needs to be in contact (Steyn & de Beer, 2011:10).

1.9.5 Two-way symmetrical communication

Two-way symmetrical communication embodies a step away from the dominant worldview that public relations exploits stakeholders for the benefit of the organisation,

instead it pushes for excellence of public relations that is practiced from a two-way symmetrical model (Grunig & Grunig, 1992:16).

1.9.6 Corporate Governance

Corporate Governance is anxious with the determination of shared action problems between scattered investors and rectification of dispute of interest among different corporate shareholders. “Corporate governance is the system by which companies are directed and controlled” (Cadbury Committee 1992 in Classens, 2006:94) In essence good corporate governance is about credible, accountable leadership. Responsible leadership is distinguished by the ethical values of trustworthiness, accountability, fairness and transparency (DO1, Chapter 1: 2009).

1.9.7 Corporate Reputation

Reputation is what the organisation's stakeholders consider to be who the organisation is. It is the collective impression of various elements of images of the organisation constructed over time based on the organisation's defining attributes, its behaviour as well as how those have been perceived. On the other hand, public relations practitioners' think of reputation management as the mean effort employed to manage relationships with the key stakeholders through the relevant media (Argenti & Druckemiller, 2004:367).

1.9.8 Community Consultation/ Engagement

Community Consultation is a procedure to call on individuals and interested community members for their views and opinions concerning specific organisations-defined issues. Community consultation also acknowledges that even though community members may wield influence, the organisation ultimately has the right to make the decision (Johnston, 2010:219).

1.9.9 Science Communication

Science communication is defined as the utilisation of suitable skills, media, activities, and dialogue to provide a single or multiple personal responses to science, like, awareness, enjoyment, interest, opinion-forming, and understanding (Burns, et al., 2003:183).

1.10 Summary

The introduction chapter contextualises the rationale and the grounding of the research. It also gives an overview of the science engagement landscape based on

the past and present South Africa using the Department of Science and Innovation (DSI) policies as well as the National Research Foundation Act.

Chapter two presents public relations literature focusing on the trajectory of the concept stakeholder relations, stakeholder engagement theories, corporate communication, strategic issues management, and two-way symmetrical communication as way of practicing public relations and reputation management.

Chapter 2: Review of Literature

2.1 Introduction

The concept of stakeholder relations is not new in business. Scholars and practitioners began investigating concepts and models advancing our understanding of the complexities of today's business challenges in the last 30 years (Parmar, et al., 2017:403-404). When the idea of stakeholder emerged at the Stanford Research Institute, it was simply as a system of organising information that was vital in strategic planning (Freeman, et al., 2018:2). A new way of understanding and remedying emerged with three interlinked business problems – the problem of realising how value is generated and commercialised, the challenge of linking ethics and capitalism, and the difficulty of assisting managers to consider management ways to solve the first two problems (Parmar, et al., 2017:404).

The management method happens across three levels: the determination of stakeholders, the development of processes that acknowledge their different needs and interests, then the establishing and construction of relationships with them with the overall process based on the organisational objectives (Mainardes, et al., 2012:1862).

2.1.1 Stakeholder Theory

Stakeholder theory promotes a pragmatic systematic, functional and ethical way to manage organisations in a decidedly complex and turbulent environment, in return the organisations gain loyalty and accomplish their goals (Harrison, et al., 2015:859). Stakeholders are groups that elevate the existence of organisations. It is vital for

organisations to understand how their operations fit into the operating environment and how their business connects with that environment in its standard management procedures as well as routine management processes. Additionally, organisations should consider how they carry out their business affairs with the groups who have a stake (Freeman, 2015:1). Stakeholder theory is important because of its comprehensive approach in agitating for treatment of stakeholders equitably with integrity and magnanimity (Harrison, et al., 2015:859). Consequently from a rational perspective, the stakeholder framework portrays a realistic picture of the location of the organisation in its entire environment.

Stakeholder management is based on legitimacy. Rawlins argue that legitimacy is ascertained by whether the stakeholder has legal, moral or assumed claim that could sway the organisation's behaviour, direction or outcome (Rawlins, 2006:5). Those who fund the organisation may have a legal legitimacy to the organisation through their financial investment, while other stakeholders are legitimate by means of their stake in the organisation because of how the organisation affects them through their business operations (de Colle, 2005:301).

A historical analysis of the business environment is particularly useful when constructing stakeholder maps in order to correctly identify the groups who are affected by the organisation (Freeman, 2015:2). Stakeholder legitimacy is understood as meaning, it is "legitimate to spend resources" on stakeholders irrespective of the appropriateness of their demands (Phillips, 2010:121). Local communities who host the operations of the organisation provide the environment, thus from that contribution, the community should benefit from the wealth generated by the presence of the organisation. Stakeholder theory acknowledges that stakeholders have legitimacy through their functionality to the organisation.

Developing stakeholder management strategies begins with specifying how and when it is timely to intervene to change the condition of a stakeholder consequence. The determination process is premised on the deep reflection of the stakeholder power to influence the organisation's direction (Ackermann & Eden, 2011:180). Mitchell et.al contend that there are three qualities worth considering when developing a stakeholder priority strategy, one is latent stakeholder who only have one feature, expectant stakeholder who own two traits, while the definitive stakeholder has three

attributes. What this means is, the latent stakeholder possesses low importance which relegates them to dormant status with power but low legitimacy – their power remains unutilised. On the other hand, the discretionary stakeholder have legitimacy yet no power to exert and no urgency in their claim, therefore are dependent on the organisation's benevolence instead of putting pressure. The demanding stakeholder possesses urgency and no legitimacy or power; this group is usually exasperating though not threatening (Mitchell, et al.,1997:875-876).

2.1.2 Public Relations as a management function

The perception of public relations as a management function yields a framework for managing programs and campaigns within a four-step method of analysis, planning, implementation and evaluation, which presents a systematic way for deciding return on investment from outcomes documentation of public relations efforts (Ledingham, 2006:413). Engagement as a theory acknowledges and respects the common humanity and ways in which each party's actions affect the other (Noland & Phillips, 2010:40). Engagement is thought to be transparent and open to public interrogation and scrutiny (Taylor & Kent, 2014:386). Noland and Phillips advocate for ethical engagement of stakeholders not only as a small organisations strategy plan rather as a broad strategy, this is because unethical practices jeopardise the success of the organisation and the value creation for the affected stakeholders (Noland & Phillips, 2010:41). It is a logical imperative for organisations to not simply make contact with stakeholders if they are to achieve proper engagement as premised in the engagement theory, instead they should have a meaningful dialogue.

Dialogue communication is thought to be an ethical way of communication because it serves to soothe power relationships, values individual decency and self-worth while also involving participants in dialogue and decision-making (Taylor & Kent, 2014:388). Noland and Phillips argue that it is necessary for organisations to institute courteous, honest and meaningful multilateral communication with their stakeholders (2010:48). Through management of organisation's stakeholder relationships, public relations view suggests achieving a balance of both party's interests (Ledingham, 2006:412). Cutlip et al. in (Steyn 2000:3) define public relations as a "management function that establishes and maintains mutually beneficial relationships between an organisation and the publics on whom its success or failure depends". At the centre of

the definition is mutuality of relationships with publics in order to achieve success or failure on the bases that communication efforts are directed at the correct stakeholder. Consequently, the importance of effective communication for each stakeholder is key.

The field of relational communication profoundly considers the concept of dialogue as a framework for contemplating ethical and meaningful relationships (Kent & Taylor, 2002). Public Relations according to Steyn and de Beer, serves the interest of society as well as the organisation to achieve a win-win situation when the development of emergent and deliberate communications strategy forms part of organisations reporting (2011:4). Mutuality is a cooperative scheme where all parties contribute with the hope of getting equal rewards while also understanding that losses will be shared (Phillips, 2010:86). In a mutually beneficial relationship not only one party enjoys the benefits.

Historically, organisations used to be very small and existed within communities where they also had personal stake, thus it was simpler to build relationships. Once they became bigger, they started depending on media to form symbolic relationships focusing on their image instead of behavioural/personal relationships (Grunig, 1993:122). In the relational nature of reputation, organisations reputations which are formed largely on perceptions are owed to them by their stakeholders (Riad Shams, 2015). Since stakeholders are active, engaging and equal participants of the unfaltering communication process, implementation of the relationship-building approach needs re-imagination of the ways in which public relations considers stakeholders (Bruning, 2002:40).

Quoting Grunig and Repper (1992:96), Slabbert and Barker emphasise the importance of the involvement of corporate communications professionals in strategic management to provide environmental scanning expertise and inputs to express the organisational mission and objectives, which offer direction from the organisational viewpoint (Slabbert & Barker, 2014:70). This approach would be a move away from press agency which Eric Goldman termed “Public be fooled” to “public be informed” denoting public information (Grunig, 1992:287). Thus the role of corporate communications should be applied from the two-way symmetrical communication

standpoint to attain successful organisational relationships (Slabbert & Barker, 2014:70).

The two-way symmetrical model went through quite a rigorous process, where Grunig and Grunig tested an already existing theory premised on synchronic and diachronic communication which was developed by Thayer (1968). Synchronic communication meant uniform behaviour of a public with the organisation, such that there is no obstruction in the function of the organisation. The diachronic wheeled in a condition that is favourable to both the organisation and the public. This may have been an acceptable position if it were not for the limitations noted by Grunig on the strength that public relations seeks equipoise instead of imbalance (Grunig & Grunig, 1992:287).

The early 20th century public relations was largely characterised by mass media communication to draw society to news, causes as well as new products. These methods of communication were largely one-way communication tools primed for what the organisation wants to share with the public (Sommerfeldt & Yang, 2018:59). The disruption of this model by communication internet (social media) makes it impossible for public relations to continue communicating in one-way dimension. Two-way symmetrical communication epitomises a step away from the dominant worldview that public relations exploits stakeholders for the benefit of the organisation, instead it pushes for excellence of public relations that is practiced from a two-way symmetrical model (Grunig & Grunig, 1992:16). To be ethical organisations should engage in a dialogue with their stakeholders on five dialogic principles: mutuality, propinquity, empathy, risk and commitment (Kent & Taylor, 2002:387). The King Report III of South Africa states the importance of a stakeholder inclusive governance approach which acknowledges that the organisation has multiple stakeholders who can exert influence in the strategy achievements of the organisation and its long-term sustainability growth (IOD, Chapter 8: 2009:2).

Managing communication with stakeholders like they were separate and disjointed groups adds no value to the organisation. Instead there needs to be a consolidated approach backed by well considered strategies, systems and behaviours that help organisations to prioritise between stakeholder needs, to position strategies and activities aimed at stakeholders to build links between them (Steyn & Puth, 2000b,

:66). The indiscriminate nature of stakeholder classification includes even those groups who negatively impact the organisation as well as those who bring value by strengthening the well-being and sustainability of the organisation's reputation. On occasion, it is not only communities who may influence the operations of the organisation rather the way in which the organisation conducts itself may affect its reputation (IOD, Chapter 8: 2009:3). Since there is already an agreement between public relations scholars that public relations has for a long time been practiced from publicity and public information biased towards presenting what the organisation wants the public to know, the two-way symmetrical model allows for an engagement between the organisation and its stakeholders

This view forms part of the central position of the King III report, which argues that the company's reputations are linked to stakeholder perceptions. Furthermore, the shaping of stakeholder perceptions is said to be premised not only on what the company communicates rather on its actions. Reputation is influenced by stakeholder perceptions, thus it is earned through relevance, and also reputation promotes connection and differentiation through authenticity (Riad Shams, 2015). This view does not minimise the importance of communication in closing imagined gaps that may occur (IOD, Chapter 8: 2009:1).

2.1.3 Considering Corporate Communication Strategy for stakeholder legitimacy

It is important to first look at the function of communication strategy as a vehicle by which organisations communicate with their stakeholders. Instead of strategic public relations, organisations use corporate communication as an acceptable and commonly prevalent term. Van Riel (1995:142 in Steyn: 2000:2) outlines the purpose of corporate communications as a consolidated approach to all communication generated by an organisation aimed at the desired groups. Likewise, the development of a corporate communications strategy benefits the organisation in dealing with issues affecting its stakeholders. Within the corporate communications strategy is a detailed list of all stakeholders and their functionality within the organisation, the issues that may arise should the stakeholders not be addressed, accordingly, the benefits for both are also highlighted (Steyn & Puth, 2000b:66).

As a management function public relations should be instrumental in the formulation of management strategies that give direction to how an organisation conducts itself within its operational environment. Appropriately, Slabber and Barker (2014:72) advocate for a two-way symmetrical practice of corporate communications to ensure successful organisation stakeholder relationship. The concept of dialogue in public relations has been topical for a while, as such scholars like Kent and Taylor reference Grunig's 1992 conceptualisation of public relations as a theory that helps in building relationships with publics who either restrict or enhance competence of the organisation to meet its mission. Furthermore, the dialogic theory in public relations is a foundation for building relationships that serve both the organisation and its stakeholders. Thus, a huge emphasis is placed on the role of communication as a tool for negotiating relationships (Kent & Taylor, 2002:21).

2.1.4 Strategic Issues Management

Issues management is a procedure that permits organisations to be aware, understand and interact effectively with their environment. The complexity within which they operate requires a dynamic response (Lauzen & Dozier, 1994:163). Heath sees strategic issues management as "a co-management of organisational and community resources (material and symbolic) through marketplace and public policy processes." The overall aim of strategic issues management is to put forward the organisational concerns and rights in mutual balance with those of stakeholders and other organisations (Heath, 2018:1). When done correctly, issues management has the ability to avert possibly harmful issues and preventing them from reaching public attention, hence some issues sometimes endure invisibility (Gaunt & Ollenburger, 1995:199). Issues management regularly deals with ethical quandaries by way of distinguishing issues, investigation, exploration and developing overall organisation policy decisions about those issues (Bowen, 2005:191). Hence organisations have to understand that communication is a procedure of an ongoing cycle of actions that follow a stream-like process over a period of time (de Beer & Rensburg, 2014:215).

2.1.4.1 Role of Public Relations in Issues Management

The issues management role of the organisation and public relations demonstrates "openness" or "closedness" of the dominant coalition (Lauzen & Dozier, 1994:165). The dominant coalition is a group that holds the power-control view in the organisation, it

constitutes top management and other individuals who set goals for the organisation as well as the values behaviour of the organisation (Berger, 2005:6-7). Stakeholder inclusivity means organisations offer stakeholders an opportunity to be listened while at the same time taking responsibility to consider them (Slabbert, 2015:44).

Issues management is the executive task of strategic public relations that handles problem-solving, organisational policy and long-term planning as well as management strategy then communicate the strategy internally and externally (Bowen, 2005:191). To be useful to the organisation, issues management has to map the environment within which the organisation operates, the mapping should be indicative of the symbolic depiction of the environment to be worthwhile to management in strategic planning. The mapping is contingent on two attributes, the first purpose is for it to be appropriately projective –suggesting that it should foresee surfacing public issues prior to becoming clear and existent threat to organisational goals. Also, a map is properly projective when its symbolic representation is receptive to weak signal issues (Ansoff 1980 in Lauzen & Dozier, 1994: 165).

Identification of issues necessitates naming, framing and claiming each signal found while scanning the environment. Thereafter, there should be a determination of whether a concern or issue prevails that might hinder the organisation from attaining its strategic business objectives. Normally, the framing of each issue controls its potential impact (Heath, 2018:10). Closed organisation systems may arrange internally directed issues management systems that work mostly on symbolic roles legitimising decisions made by the dominant coalition placing organisations as environmentally accessible while the opposite is true. Stakeholders are provided no obvious or existent linkage to the organisational sustainability and growth (Lauzen & Dozier, 1994:168).

Bowen argues that the crucial role of public relations towards organisational effectiveness can be assessed in the relationships established and upheld by the role (2005:199). In organisations where there is no regard for public relations, the organisation positions public relations as an office-holder rather than useful, and only used it as a mouth-piece for word out and always on standby for its technical support. What follows is issues management and public relations mostly carrying out symbolic

functions and administrative roles with no strategic action (Lauzen & Dozier, 1994:169). Berger advises that public relations managers need to be part of the dominant coalition to positively sway organisational choices, ideology and practices. In this way, public relations would assist the organisation in social responsibility obligations management and building meaningful relationships with others. The ideal outcome is public relations managers who move up the ranks function on the fundamental principle of a relational or symmetrical (excellence) worldview doing what is right for the profession, organisation and society (Berger, 2005:8).

2.1.5 Stakeholder Relations to manage organisation's reputation

Reputation is the most important and valued organisational asset. The indispensable nature of reputation allows organisations with good reputation to “charge premium prices, have greater access to new markets and products, have great access to capital, profit from great word-of-mouth endorsement, and possess an unduplicated identity (Anani-Bossman, 2020:1).” Reputation is a magnificent calling card that charms followers, open doors and commands veneration (Fombrun & Van Riel, 2004:4). Ravasi et al. have linked the formation of organisational reputation to six perspectives, all of which demonstrate that reputation impacts the behaviour of stakeholders towards the organisations, also reflects the complete impressions, beliefs and evaluations of attributes stakeholders see as relevant (Fombrun 1996, Rindova et al.2005 in Ravasi et al.2018:574).

The game theoretic perspective is rooted in economic studies; the theory examines the effect of reputation on recurrent competitive interactions. The assumption is, market players deal with information asymmetries about each other's intentions and strategic styles, then reputations provide worthwhile substitutes. It's signalling mainly focuses on the idea that participants are interactional in their participation to cue information about their observable attributes and the effect they have on their counterpart's beliefs (Ravasi, et al., 2018:576).

Image according to Argenti and Druckenmiller is an expression of the organisations identity and corporate brand, meaning what stakeholders consider about the organisation from their perspective (2004:268). The strategic perspective considers any action by competitors that gives a direct or indirect indication of its purpose,

motive, goals or internal situation. Organisations may showcase effective signals by appealing to high levels of market activity using creative and symbolic actions to catch media attention, some organisations use corporate social performance or environmental compliance to achieve their strategic perspective. In for profit organisations, they may even hire a CEO who may appeal to the markets in order to elevate the organisations profile (Love, et al., 2017:1465). However, violations of stakeholder expectations still hold more value on how the organisation could be perceived in future (Ravasi, et al., 2018:578).

The macro-cognitive perspective of reputation expands on economic and strategic perspectives by positing that reputation is an end-product of information exchanges and social influence between multiplicities of actors engaging in an organisational field. It is also argued that reputation is a collection of diverse appreciation and awareness about organisations by a multitude of stakeholder groups instead of generalised individual evaluation. Additionally, reputation is considered a collection of opinions and beliefs as well as reputational ratings that demonstrate a collective process through which reputations form (Ravasi, et al., 2018:578-579).

As a relational concept, reputation forms and reforms through stakeholder relationships as well as interactions (Riad Shams, 2015:314). Hence on occasion organisations promote initiatives like science engagement or outreach to advance their agenda with the hope of positioning themselves within society while also trying to improve their reputation and image. This is certainly common since stakeholder engagement has for some time been equated to corporate social investment used as a tool to gain support among communities affected by the operations of businesses. Sometimes, some organisations consider this form of engagement as stakeholder relations. Managing perceptions linked with stakeholders is crucial to managing reputation. Shams posits that both brand and reputation are dependent on strategic communication to influence people's perception with the objectives of ensuring that target groups view the organisation and its offerings in good light (Riad Shams, 2015:316). Naturally, organisations may influence perception about their reputations through communication tactics, yet complete control is impossible.

Lately according to (Greenwood, 2007:324), there is incomparability from the assumption that stakeholder engagement is corporate social investment. In the

business context, corporate social responsibility occurs when strategic management of stakeholders does not exercise unbiased responsibility. In other words, organisations struggle to resist the temptation to rationalise their actions within communities by establishing unsustainable programmes that are not informed by meaningful stakeholder engagement. Consequently, organisations are encouraged to adopt good corporate governance that demonstrates responsible and ethical behaviour (Steyn & Niemann, 2014). This will bring forth a value system that satisfies business and stakeholders.

The communicative perspective came as a result of the development of corporate communication as a field of practice. When communication practitioners became interested in “corporate identity” and “corporate positioning” as a form of managing reputations (Van Riel, 1997:289). Organisations have over the years learned how quickly reputation can be damaged and how that could impact employees and customer loyalty, while also acknowledging the importance of corporate reputation in achieving organisational goals and competitiveness (Argenti & Druckemiller, 2004:368). Corporate identity was incorporated in corporate communication according to Van Riel, to demonstrate the way in which the organisation introduces itself by virtue of its behaviour and emblems (Van Riel, 1997:290).

Wheeler and Sillanpää (1998: 205) classify stakeholder groups as “any individual or entity who can be affected by an organisation or who may in turn, bring influence to bear.” Perhaps defined by Freeman (1984 in Park & Lee, 2015:4) as an interest-based definition of stakeholder, meaning “persons or groups that have, or claim to have, ownership, rights, or interest in an organization and its activities.” They are the ones who help the organisations to attain corporate brand equity, which is possible when those attended by the organisation think highly, hold intense positive and distinct associations about the corporate identity in their memory (Keller 2002 in Argenti & Druckemiller, 2004:368).

The communication perspective views communication as “the ongoing, dynamic interactive process of manipulating symbols toward the creation, maintenance, destruction, and transformation of meanings” (Ravasi, et al., 2018:581). Reputation is argued to be a communicative construction that is always transitional as participants navigate actions and appraisals. The significance of the communication perspective is

communicative interrelations that structure social constructs expressing the idea that communication is a design of social evaluation process (Christensen & Cornelissen, 2011).

The King Report III (chapter 1, 2009:20) agitates for good corporate governance, this view is supported by ethical leadership which asserts the importance of stakeholder interaction as part of responsible leadership. In addition, the organisations triple bottom line performance encourages the organisation to conduct business in ways that its assets flow to multiple stakeholders (Javed, et al., 2019:503). To be able to effect benefits, each organisation has to understand their stakeholders by mapping them according to their functionality within the organisation. Stakeholder mapping is not a standalone model, rather it is incorporated into a corporate communications strategy, which also includes issues that may arise.

To contextualise this argument, (Coombs & Holladay, 2015:690) describe public relations as “a strategic communication process that builds mutually beneficial relationships between organisations and their publics.” The role of stakeholder engagement is to ascertain if mutuality and shared vision is being achieved where priority is given to relationships with communities that have legitimacy, power and urgency (Rawlins, 2006) that could affect the organisation. Also, Javed et al. suggest that organisations function in an interconnected world thus have to collaborate with internal and external stakeholders. This argument strengthens the notion that continued feasibility and sustainability of an organisation rests on the influence of diverse stakeholders (2019:503).

Engagement proposes a base for creating organisational relationships with the intention of facilitating community-organisation interaction. Stakeholder engagement reveals opportunities for organisations to move towards considering those who have the ability to impact their organisation as not just objects for corporate image expediency but groups with whom an organisation could establish meaningful relationships. Instead of looking out for their businesses, they should rather think collectively and reflectively. Stakeholder engagement ultimately fosters partnerships instead of domination, integration of stakeholders will therefore lead to sustainability (Johnston, 2014:381). Therefore, the sustainability of an organisations depends on the establishment of good relationships with stakeholders.

The principal element of sustainability is an object of communication in all its stature, therefore sustainability for all hinges on the consciousness of communication about issues that affect everyone (de Beer & Rensburg, 2014:208). Robert Phillips frames stakeholder legitimacy as access to legitimate resources irrespective of the appropriateness of the demands. Obviously the status of major stakeholders is equal to moral legitimacy, meaning such stakeholders are those groups to whom a moral obligation is owed (Phillips, 2010:120-122).

The power of public relations in building trust, achieving social acceptance for the organisation as well as accomplishing greater understanding for those public spheres where the organisation needs to be in contact makes it possible to integrate stakeholder needs and expectations (Steyn & de Beer, 2011:10). Therefore, there is value in assuming stakeholder engagement by way of the two-way symmetrical communication between organisations and their stakeholders (Steyn, 2002). This is especially important from the reputation relational relevance perspective of the community as well as the recognition of the vital role an organisation plays where it is located and within its respective operations.

2.1.6 Science Literacy and science communication

Scientific Literacy

Science is essential to our knowledge society because it affects humanity's everyday lives in varying ways. Many vital decisions people make are based upon comprehension and evaluation of scientific evidence, claims, and arguments (Hendriks & Kienhues, 2019:29). One of the functions, powers, and duties of the National Research Foundation is to make scientific knowledge and technology available through any medium (Act 23 of 1998). Laugksch locates scientific literacy in different category groups, like the science education community which is interested in the nature, purpose, performance, and modification of the current education system. Their concern is mostly driven by issues relating to the goals of science education – i.e the link between formal education and scientific literacy.

The second group comprises social scientists and public opinion researchers who care about science and technology policy issues. This group frets about the scope of the general public's support for science and technology, together with the participation of

the public in science and technology policy actions. Another group includes sociologists and science educators who employ a sociological process for scientific literacy. Their concern is around the construction of specialist knowledge of science. The field of investigation relates to how people's everyday life is interpreted and negotiated using scientific knowledge and their social access, trust, and impetus are connected to public understanding of and support for science. Then the informal and nonformal science education community who are involved with overall science communication. The group has professionals who provide educational and interpretive prospects to the general public for a better understanding of science. Some of the professionals include science centres, science journalists, writers, and science exhibition employees (Laugksch, 2009:75).

Our sense-making abilities are developed from birth using observation and experiences to acquire innate theories about the natural world based on objects- physics, plants, and animals – biology, and other people's minds - psychology (Hendriks & Kienhues, 2019:32). At individual and societal levels people have to be scientifically literate to deal with science. People are not passively receiving socialisation influences, instead, they are part of a social world shaping their understanding of the world as they understand it (Howitt, 2010:280). While there is no universal definition for scientific literacy the Program for International Student Assessment (PISA) (OECD 2016) coined it as meaning being a reflective citizen, which entails the ability to engage with science-related matters as well as with ideas of science. The scientific knowledge forms constitute content, procedural and epistemic knowledge (Hendriks & Kienhues, 2019:35).

2.1.6.1 Science communication

Science communication is defined as the utilisation of suitable skills, media, activities, and dialogue to provide a single or multiple personal responses to science, like, awareness, enjoyment, interest, opinion-forming, and understanding (Burns, et al., 2003:183). The dialogue is usually facilitated by corporate communication as a management function that provides a framework for successful coordination of internal and external communication with the overall intent of creating and sustaining beneficial reputations with stakeholder groups upon which the organisation is reliant (Cornelissen, 2020:5).

So far, the 1996 White paper places great importance on the promotion of an information society and knowledge generation to achieve a balance between communities and society. Likewise, the national vision for information society attempts to ensure the creation of a fair information order nationally and regionally, considering the undeniable potential of communities at different levels to work together to eliminate differences and achieve mutual upliftment as well as address basic needs and to equalise disproportionate social development (DACST, 1996:16). Coming from the history of poor standing of science within society as articulated by du Plessis (2017), communication signifies an influential foundation that sets up a stage from which relationships can be defined and disassembled.

As well, the Science and Innovation Strategic Plan outlines the importance of revamping the general public's knowledge about science (DSI, 2020-2025:34). To heighten the importance of science for society, upon launching the Southern African Large Telescope (SALT), President Thabo Mbeki in his speech, talked about the second liberation of "humanity from blind action informed by superstition that derives from a failure to fathom the regularities and imperatives of the infinite natural world" (Polity, 2005: 2).

Science is supposedly the best achievement of our culture, so people ought to know about it. Conceptually, some scholars argue that comprehension of science communication in a cultural context could help the public to be both analysts and practitioners. This idea of studying and doing public communication might be useful in focusing on meaning formed through stories about science. This process may inspire people to query not whether truths are shared successfully, but what is being strengthened through occasions of public storytelling about science (Davies, et al., 2019:4). The prosperity of science communication is driven by the need to democratise science which denotes engagement with the public and that scientists have to interact with laypeople (Weingart & Guenther, 2016:2).

The DSI Science Engagement Strategy has four major strategic aims to popularise science, engineering, technology and innovation as appealing, relevant, and accessible to improve scientific literacy as well as to stimulate interest in relevant careers. The wide-ranging category initiative are science for the public, science for education support and the promotion of careers in science. The second strategic goal

is to cultivate a critical public that keenly engages and participates in the national dialogue of science and technology to benefit society. These dialogues would be supported by DSI through engagement with major stakeholders around issues relating to development disputes. The third aim is the promotion of science communication that improves science engagement in the country.

Effective science communication will yield science engagement, although it is also acknowledged that professionally the field is underdeveloped as a discipline and medium in South Africa. The fourth strategic aim is the profiling of South African science and science achievements locally and internationally to showcase the contribution to national development and global science with the hope of increasing their public standing. All these goals would be possible with the coordination of science engagement initiatives across many stakeholders including recently a revision of the National Research Foundation (NRF) Act to legally include science promotion and engagement as mandate. The role of human science research is considered crucial and enriching in understanding the social, economic and cultural well-being, similarly, the provision of the context in which the policy, innovation and technology can progress. Among the field considered to be useful in helping with the effort of engagement with the public is corporate communication, its function would be to assist with the messaging by organisations internally and externally (DSI, 2015:3-13)

2.3 Summary

Reputation is relational, organisations therefore do not completely own it, instead it is derived from stakeholder perceptions (Riad Shams, 2015:316). It is through public relations strategies that organisations can influence stakeholder perceptions. The role of public relations therefore is to provide a bridge between the interest of the organisation and those of society to accomplish a win-win situation through the development of emergent and intentional communication strategy which should form part of organisational reporting (Steyn & de Beer, 2011 :4). Depending on the influence of the organisation, stakeholders may want to associate with them or not (Riad Shams, 2015:314) hence reputation is assumed to be a continuous negotiation between the parties involved.

The next chapter deals with the theoretical framework of the study as well as the methodology used to understand the relational nature of communication.

Chapter 3: Conceptual/Theoretical Framework and Research Methodology

3.1 Introduction

The study is using qualitative research design to understand and explore the stakeholder relationships as well as perceptions about the South African Astronomical Observatory from the view of its most important stakeholder group, the Sutherland community. Qualitative investigations highlight meanings that are less detectable while also attempting to unearth the intricacies of our social world. In so doing, they explore 'what' 'why' and 'how' questions contrary to quantitative studies (Tuffour, 2017:1).

3.2 Research Methodology

The study draws on interpretative phenomenological analysis (IPA) framework, a method relating to capturing individual accounts and reflections to explore and interpret meaning attached while making sense of them (Ritchie, et al., 2013). IPA assumes that the individual who experiences something is the authority on the experience (Howitt, 2010:272). Corporate communication as a practice is concerned with reputation management and positioning organisational messages to engage stakeholders as well as to familiarise them with the organisations business practices. Since the attributes of reputation about an organisation exist in the mind of the observer (Wergelt & Camerer in Ravasi et al. 2018:576), it is thus fitting to use a research methodology that seeks to interpret the impressions and feelings of those affected by a phenomenon using IPA.

The interpretive phenomenological analysis was first developed within health psychology in the 1990's to understand the experience of health issues such as pain. Subsequently, IPA has extended to social and clinical psychology. The supposition of interpretive phenomenological analysis is that people are sense-making and provide meaning to their experiences (Howitt, 2010:271). The modern-day theorists of IPA, Smith, Flowers and Larkin, argue that IPA reveals that human beings are sense-

making beings as a result, the explanations which participants share will reflect their efforts to make sense of their experience (2009:4). People are therefore not passively accepting socialisation influences, rather they are part of the social world crafting their understanding of the world as they perceive it. It is an inherent human trait to interpret actions of others against their own and adjust actions accordingly (Howitt, 2010:280).

Within IPA there is symbolic interactionism which suggests that mind and conceptions of self-develop in social interactions between people, denoting that communication occurs before one develops the language to articulate feelings. This means communication is an act involving others, hence communication is a fundamental medium through which meaning is learned and established (Howitt, 2010:281). As a result, IPA is considered suitable for analysing lived experiences that are especially complex and emotionally charged. Many researchers see the IPA approach as participant adapted qualitative research method that demonstrates respect and sensitivity towards the lived experiences of the research participants (Alase, 2017:9-10). IPA appeals to researchers because of its attention to intersectional and meandering of experiences, as well as its detailed scrutiny and nuanced analysis of lived experiences of small number participants (Tuffour, 2017:1).

In 2005, a period considered a turning point in astronomy, outreach was intensified and considered an imperative to justify the huge investment on the Southern African Large Telescope (SAAO, 2021). The South African Astronomical Observatory created a SALT Collateral Benefits Programme to interface with schools and the general public of South Africa. This was during the building of the Southern African Large Telescope (SALT) which was later launched in Sutherland to the great elation of the Sutherland community in 2005. For the first time, the Sutherland town would be visible. True to visibility, there was also a boom of tourism development in the town with guest houses, bed and breakfast establishments built in anticipation of the influx of tourists who would visit SALT.

At the same time, Sutherland was on track to benefit from a role as the centre of science and technology that the development of Southern African Large Telescope (SALT) promised, and that seemed portended by how accessible the Observatory was to be to the public – full access through tours and stargazing. This type of edu-tourism

was to play a significant role in public understanding and engagement with science (Ingle, 2010:97). As an economic fortification, tourism in South Africa and worldwide is considered a catalyst for development linked to job creation (Kontsiwe & Visser, 2019:1335). Based on the numbers collected by SAAO, each year about 13000 tourists visit Sutherland and SALT. The Observatory also hails itself for training and retaining five young unemployed youth as tourist guides (Manxoyi, 2016:35).

Although the Observatory had already been doing rotational observations at the Sutherland site since 1967 (Warner, 1979: 123), the significant moment for the community was the building of the Southern African Large Telescope (SALT). During the launch, the Observatory made an effort to include the community by hosting a community centred event at the rugby stadium in town. This closeness and consideration created huge expectations. The Observatory as a facility of the National Research Foundation is also expected to raise public awareness of science along with community engagement (NRF, 2019).

Until the 1990's, the public engagement programs around the observatories in South Africa were largely focused on the benefit of science for science sake, thus intentionally excluded the broader majority of South Africans (Dubow, 2018:664,). Since the early 2000's the optics have arguably been centred around visibility and international competitiveness in the field of astronomy research hence the investment in SALT. To realise the hopes and aspirations of a nation trying to define its place in science, President Thabo Mbeki's speech further expressed the importance of the Southern African Large Telescope in demystifying science, and that humanity would benefit from the establishment of a complex of astronomical facilities in Southern Africa and Africa (Polity, 2005:2).

Given the tenets of meaning-making of IPA, it is worth acknowledging that the study is seeking to understand relational means of communication between the Sutherland community and the Observatory. In this way, this research is on a quest to understand stakeholder perceptions about the South African Astronomical Observatory regarding its public relations activities. Central to perceptions is reputation management and risk, organisations have over time realised how quickly reputation can be damaged and how that could impact employees and customer loyalty. Apart from that there is an

acknowledgement of the importance of corporate reputation to achieve organisational goals and remain competitive (Argenti & Druckenmiller, 2004:368).

From a viewpoint of relational communication stakeholder relationships are perceived as part of a socially constructed reality, thus stakeholder relationships are not impartial instead they are in a mutable state (Onkila, 2011:380). Similarly, corporate communication provides for creation of meaning and socialisation of stakeholders to the organisational culture, thus organisations can facilitate the establishment of mutuality as well as legitimacy to form long-term relationships that shape the organisation's image and reputation (Mohamad & AbuBakar, 2018:242). In this regard, legitimacy can be derived from establishing robust lasting relationships that are a necessity for the Observatory to gain stakeholder support (Steyn, 2000).

Turpin et al. (in Pietkiewicz & Smith, 2014), argue that the clinical psychology doctoral programmes in Britain suggest six to eight participants are suitable for interpretative phenomenological analysis (IPA). This sample size offers an opportunity to look at similarities as well as differences between individuals, for this reason, seven participants from Sutherland were interviewed. IPA differs from other qualitative methods by not regarding participants as simply providers of text to be interpreted, instead it integrates more elements of the individual into the analysis (Howitt, 2010, 274). Conforming to the phenomenological underpinnings, IPA is occupied with trying to comprehend what it is like from the perspective of the participant, while also concerned with asking critical questions of the participants' accounts. Therefore, interpretation can take the form of descriptive and emphatic, with the aim of producing "rich experiential descriptions" (Shinebourne, 2011:21).

3.2.1 Purposive sampling

The study participants were purposively recruited for interviews based on their availability and willingness to participate in the study. This sample technique is based on the convenience of the researcher, with this method, there is no need for a list of all population elements. The limitation of the purposive method is data cannot be generalised past the sample (Acharya, et al., 2013:332).

The purposive sampling allows for homogenous sampling (Sharma, 2017:751), thus the Sutherland community fits the definition as a community that is being studied. Also,

purposive sampling technique is a form of non-probability sampling that is valid when one has to study a certain cultural area with proficient experts within. The validity of the sample relies on representation of the area it represents (Tongco, 2007:147-154). The recruitment of participants was achieved by engaging the community leader who used his knowledge of the community to recruit participants. This was after the researcher went to a municipal public meeting on 28 November 2019 to recruit participants but the effort yielded no results.

Certainly, the selected participants have in-depth knowledge (Etikan, et al., 2015:2) of the Observatory. Using the purposive maximum variation sampling (Etikan, et al., 2015:3), the participants ranged from those who have lived in Sutherland before SALT was built, to those who remember the official opening in 2005 and have witnessed the building as well as the commissioning of the Southern African Large Telescope (SALT).

3.2.2 Table of Purposive sample of participants involved in the study

Participants by numbers to protect their names	Method of data collection	Date of interview	Location or place
Participant 1	Semi-structured interview	30 March 2021 07h30	Participant's workplace, Sutherland
Participant 2	Semi-structured interview	30 March 2021 11h30	Community Dev. Centre, Sutherland
Participant 3	Semi-structured interview	30 March 2021 14h00	Participant's workplace, Sutherland
Participant 4	Semi-structured interview	30 March 2021 15h30	Community Dev. Centre, Sutherland

Participant 5	Semi-structured interview	31 March 2021 09h00	Participant's workplace, Sutherland
Participant 6	Semi-structured interview	31 March 2021 17h00	Community Dev. Centre, Sutherland
Participant 7	Semi-structured interview	31 March 2021 18h00	Community Dev. Centre, Sutherland

3.2.3 Interview Schedule

To understand the nature of the relationship that exists between the South African Astronomical Observatory and the Sutherland community, it is vital to look at the significant stages of change at the Observatory. Meaning, the relocation of the research telescopes to Sutherland on 15 March 1973 alongside the Southern African Large Telescope (SALT) inaugural ceremony on 10 November 2005.

Two Heads of State representing South Africa at different political periods, had varying aspirations for what astronomy should contribute to society and what should be its focus. Prime Minister B.J. Voster emphasised the concern “to develop South African interest in astronomy and astrophysics, because we believe that research into an abstract science is healthy and indeed vital to the progress of our universities. Thus we have already entered into an agreement with an overseas agency, the Science Research Council, and we are most anxious to encourage overseas astronomers to come here to work because we believe that the presence of men of the highest scientific eminence, such as our guests today, is of utmost benefit not only to astronomy, but to all other sciences and to the universities and to the nation as a whole” (CSIR, 1973, p. 12).

During the inauguration of SALT in 2005, President Thabo Mvuyelwa Mbeki, said, “The observatory is a place dedicated to the pursuit of knowledge. Its sole purpose is the discovery of the unknown, and therefore the further liberation of humanity from blind action informed by superstition that derives from failure to fathom the regularities and imperatives of the infinite natural world” (Polity, 2005, p. 2).

Contained in Mbeki's statement above is a quest for knowledge to empower humanity and to engage meaningfully with scientific knowledge. The question of meaning making then becomes imperative in relationship building. The semi-structured interview protocol followed the exact sequence depending on the responses from participants, which was then followed by a follow-up question and a request for clarity or explanation.

The participants were all from Sutherland, so naturally the interviews were conducted in their town in March 2021 at times they requested or convenient to them. Some preferred to be interviewed at their work places while those who were not working on the day of the interview preferred or chose to be interviewed at the Sutherland Community Development Centre. Each interview began with the same introduction of the student, the purpose of the study with emphasis on confidentiality of the information shared between interviewer and the interviewee as well as protection of each participant's identity throughout.

1. How long have you lived in Sutherland? What was it like before the Observatory moved to Sutherland or when SALT was launched?
2. What are your most memorable thoughts/experiences of Observatory when SALT was built or when the first two telescopes were brought here? (Positive or negative)
2. What is the feeling you associate with that moment or the Observatory?
3. Tell me about your understanding of the role of the Observatory either in your community or the town?
4. What about Sutherland makes it special, say if a visitor were to ask you?
5. If asked about "astronomy", what image comes to mind?
6. In January 2009 there was a big astronomy event here in Sutherland, what was your involvement? Did you know about it?
7. There used to be bus trips from town to the Observatory some time ago, did you ever go? (If yes) How was your experience? / (If no), why did you not go?
8. A while ago, there was a light pollution consultation with the community. Do you remember?
 - How was the consultation, did you feel like community views were considered?
If not, how were they not considered?

- If yes, what made you feel like they were?

9. What would you say astronomy approach is: “astronomy for itself”? Or

- “Astronomy despite/regardless of people”
- “Astronomy for people”
- “Astronomy and people” (Engen, et al., 2019)

3.2.4 Data collection and analysis

The data was collected using the semi-structured interviews. Interviewing is considered a powerful way of trying to understand human beings (Fontana & Frey, 2005) and it helps with gathering large amounts of data swiftly (Marshall & Rossman, 1995). Moreover, semi-structured interviews allow for more explorations of a range of topics, flexible questioning and gathering of opinions as well as behaviours of those being interviewed. Irving Seidman (1937:8) says, the purpose of interviewing is not to test the hypothesis or evaluate, rather interviewing is a means to gain understanding of lived experiences of other people and the meaning they make of that experience. Interviewing provides a necessary avenue of inquiry, which gains us insight into important social issues (Seidman, 1937:11-14).

To test the reliability of data provided there has to be consistency in the information across the community which may be considered as a ratio of the number of accurate and misleading pieces of information (Tongco, 2007:154). The qualitative open ended semi-structured interviews permit the researcher and the participant to partake in a dialogue in real time, wherein there will be enough room and agility for original and unforeseen issues to arise, thereby allowing the researcher to probe more with further questions.

The data have been analysed for themes allowing the researcher to make sense of perceptions, in a detailed, plausible and transparent account of meaning which is consistent with the interpretative phenomenological analysis (IPA) research method (Larking & Thompson, 2012: 99-116). Also, note-making during the interviews has helped the data analyst to confirm changes or point out any contradictions between what was shared during the interview and what is transcribed. The aim was searching for themes as well as interconnections, normally the themes or superordinate themes are ordered appropriately. Superordinate themes are a cluster of similar yet relatively different unique themes (Howitt, 2010:287-288). An identification of pattern of data

eventually enables the drawing up of a hierarchical diagram demonstrating themes presenting an overview of the analysis.

The hierarchical diagram brings to bear what matters to the participants and what those things mean to the participants. While there is no absolute rule for IPA data analysis, scholars who pioneered the method suggest a seven-step data analysis guide (Smith et al., in Charlick, et al., 2016) where data can be analysed through immersion, bracketing of previous themes and keeping an open mind for every case, pattern-making as well as taking interpretations to deeper levels.

3.2.3.1 Data Analysis

The interpretive phenomenological analysis is guided by the methodologies from phenomenology, hermeneutics and idiography. All three shape the development of IPA. The objective of phenomenology is to understand lived experiences thus the inquiry uses the descriptive and interpretive approaches as foundational pillars. Smith with other scholars, say interpretive phenomenology reveals and interprets immersed meaning in one's lived experience. The idiography on the other hand is concerned with sense of detail focusing on meticulous and coherent depth of analysis. In addition, it seeks to understand how a specific experiential phenomenon (event, process or relationship) has been perceived from the viewpoint of certain people in their context. Hermeneutics entail grammatical and psychological interpretation, grammatical revolves around the exact and textual meaning, while psychological interpretation leans towards the individuality of the speaker (in Charlick, et al., 2016:206-208). Moreover, experience and meaning are inextricably linked, therefore, language is both a descriptive and demonstrative tool to articulate one's experience. Tuffour encourages researchers using IPA to pay particular attention to idiography during the analysis process for an accurately detailed examination of the convergence and divergence between the participant's experiences (Tuffour, 2017:3-4).

The data collected in semi-structured interviews were recorded with permission requested and granted beforehand by each participant. During the interview stage, all participants were of consenting age and sound mind, they all were willing to participate in the study. Participants were given consent forms to read and understand before. Importantly, all the questions asked were only seeking to understand their lived experience in Sutherland, Northern Cape. The analysis was first transcribed from the

recorded interviews. To be able to see themes and meanings participants make of their interactions with the Observatory, a second reading of the transcription was required so as to see the description of experiences then interpret the meaning in order to get themes that link or not to the research questions of the study.

3.2.3.2 The analysis sequence was done this way:

All the interviews were recorded with permission from participants and data were transcribed verbatim, thereafter read and reread against the recording to check if the transcription corresponded with the recording. Then the analysis of what was said in response to the questions revealed themes that were common across participants, along with the descriptions of their experiences with the Observatory. The next analysis step led to developing the experiential/emergent themes searching for connections across experiential themes, thereafter the themes were clustered and interpreted to see patterns across all interviews.

3.3 Conceptual/Theoretical Framework

The study uses the dialogic theory, which is a concept borrowed from philosophy and relational communication. Its inclusion in public relations is critical towards perceiving how organisations can cultivate relationships that mutually serve organisations and public interests (Kent & Taylor, 2002:21). Steyn and Niemann (2010:107) emphasise the importance of societal adaptation by organisations to meet stakeholder expectations, values and norms to maintain a good reputation.

Sincerity is key in advancing dialogue-based relationships with key stakeholders, where there are regular conversations aimed at listening to input and opinions from stakeholders, (Wheeler & Sillanpää, 1998:203). Consequently, organisations that are open to dialogic conversations with their stakeholders develop a competitive edge over those reluctant or who have not adapted. The enterprise strategy which is a drive towards economic, social, and environmentally sustainable business methods (Steyn & Niemann, 2014), and the King III report locate stakeholders in the role of business and relationship management as well as strategic communication. Likewise, the King III report argues that organisations should appreciate stakeholder interest and expectations, even when not deemed unwarranted or illegitimate (IOD, 8: 2009).

A two-way symmetrical approach suggests a move away from old ways of doing public relations that were predominantly through press agency and mass media communication advocating interests of the organisation only. Instead, there should be a strategy for each stakeholder group Wheeler & Sillanpää (in Steyn, 2002). Grunig and Grunig (1992) propose the two-way symmetrical model as an ethical approach to public relations which is effective in meeting organisational goals. As such, creating communication channels and keeping them open before issues arise may possibly build a trust relationship. In support of this argument Heath in (Grunig & Grunig, 1992), say dialogue and collaboration promote guardianship. Heath also adds, "Symmetry is best defined by the ability of ideas to sustain themselves under public discourse" (Cooper, 2008).

The public relations function externally according to Steyn and de Beer, is to reinforce public trust and to achieve a socially responsible image for the organisation while also attaining greater understanding and support in the public spheres where the organisation needs to be in contact (2011:10). Equally, the reflective public relations function is evident in the feedback loop between society and organisation through the two-way symmetrical communication approach (Steyn & Beer, 2011:11). Kent and Taylor locate the notion of dialogue or two-way communication in many fields like philosophy, rhetoric, psychology as well as relational communication (2002:22).

It is considered an ethical way of communication critical to differentiating truth from falsehood. Implicit in the tenet of the dialogic approach is the belief that interactions influence the quality of communication and eventually effect the development of a relationship. Kent and Taylor (2002) further elaborate, the field of relational communication profoundly considers the concept of dialogue as a framework for contemplating ethical and meaningful relationships. The idea of public relations as building relationships with publics to advance the organisation's capacity to realise its mission as argued by (Grunig, 1992) is key to altering the role of public relations from managing public opinion to shaping, nurturing and maintaining relationships (Kent & Taylor, 2002).

3.4 Ethical considerations

Ethics are critical to research design process and methods; therefore, participants were given an opportunity to sanction their participation through written consent forms

which were provided by the Cape Peninsula University of Technology. Participants were apprised of their freedom to pull out of the study should they so wish and some pulled out. Confidentiality of participants and their responses are protected as indicated on the consent forms and the researcher will only refer to them as participant numbers throughout the document according to the order of interviews. The interview recordings will only be shared with the Cape Peninsula University of Technology since it is mandatory for students to give the institution raw data.

Permission was sought and granted by the South African Astronomy Observatory (SAAO) since the study is about this Observatory. Additionally, the community members who were approached to participate in the study voluntarily agreed to participate, signed the consent forms then agreed to be recorded during the interview process. They also have no issue with data usage in any form of publications, research papers or thesis publication. A declaration and disclosure of biases by the student was obtained for ethical integrity of the study. Thus a non-bias disclosure towards any party should be signed to protect the ethical integrity of the research. All the ethics clearance documents are attached as appendices.

3.5 Summary

Qualitative research is not extractive rather it is instructional to the researcher, and the choice of methodology also allows the participants to reflect on the phenomenon that has affected them. The description and interpretation allowed for themes to form and to be analysed in the ways that bring to the foreground what matters to the participants. Similarly, an understanding that socialisation does not happen in isolation elevates the importance of dialogue and engagement between those who are involved or impacted by the phenomenon. Also without the consent and willingness of those whose lives are the subject of the study, the study would not be valid.

Chapter 4: Analysis and Theorisation of Results

4.1 Introduction

This chapter presents data analysis and results collected from semi-structured interviews in Sutherland. The participants live in Sutherland, a town located 15 km away from the South African Astronomical Observatory (SAAO) research facility with

telescopes visible from the distance on the plateau. The study's main aim was to understand and investigate the perceptions and stakeholder expectations about the role the SA Astronomical Observatory plays in establishing and nurturing relations with science communication for brand and reputation management. To understand perceptions, the study used the lens of the strategic role of public relations as a management function that helps organisations to adjust to their societal and stakeholder environment.

The objectives of the study were:

- To investigate community perceptions about the South African Astronomical Observatory (SAAO)
- To explore the nature of stakeholder engagement/communication that currently exists between the astronomical observatory and the Sutherland community
- To understand if a collaborative relationship could be established between the astronomical observatory and the community around it.

4.2 Analysis

4.2.1 Formulation of Themes

The themes are formulated based on the interview responses from participants, using the pillars of the interpretive phenomenological analysis which are phenomenology, hermeneutics and idiography.

- **Phenomenology and idiography**

The phenomenon being studied is the South African Astronomical Observatory (SAAO) and the perception the local community have of it since its telescopes were relocated from Cape Town to Sutherland in the 1970s as well as the commissioning and launching of a new big telescope, the Southern African Large Telescope (SALT) in 2005. Some of the participants were in school when the first two telescopes were moved to Sutherland, they bore witness to the inauguration of the Sutherland Observatory in 1973 (CSIR, 1973:12). Other participants were not yet born then but were old enough during the building and commissioning of SALT. All the interview questions revolved around the events and daily engagements between the SAAO and the Sutherland community. The description and interpretation of the events, processes and relationship demonstrate the perceptions of the community about the SAAO. The

table below reveals the method utilised to interrogate the transcriptions in order to provide the analysis based on the sense-making and interpretation of the participants' views and feelings towards the SAAO.

4.2.2 Looking for connection of themes or patterns that converge

Using the research questions to foreground the themes that emerge from the interview responses, the preliminary list of themes that emerged (Smith, et al., 1999:221-223) from the interview participant 1 transcript are noted this way:

Base of the questions asked	Experiential Themes
Making sense of the launch of SALT	- waste of money
Curiosity about astronomy	- relies on a friend to get information
Building of SALT	- delivered goods to the Observatory no official tour/community visit
Community awareness	- you must look at your community
Expectation	- revenue injection into the town
Socio-economic issues	- Hope for employment/business opportunities
Engagement	- No clear line of communication
Contribution	- put Sutherland on the map
Community involvement/yearning	- introduce the place to the community - No community activities
Community bus to the Observatory	- did not care about it
Astronomy position within society/community	- for people but it is closed
Science awareness	- get people more involved not only children -Share discoveries with community
Opportunities	- there is not a job opportunity
Community care	- lack of initiatives to engage
Career pathing	- no bursaries for further studies
Astronomy Geographic Advantage	- Top-up approach may lead to retaliation
Programs after school	- No holiday programs for school children

According to the participants, Sutherland relied on Calvinia for weather forecast because it was too small until the Southern African Large Telescope (SALT) was built

and commissioned with the promise of being accessible to the general public through tours and stargazing. Now that there is SALT and a huge potential for tourism, their small town has edu-tourism/ astro-tourism which attracts many tourists into the town. Now that it is known that Sutherland snows in winter and has the most beautiful night skies, things have changed for the town a little bit, especially for those people who had the financial means to buy guest houses or B&Bs.

During clustering similar themes emerged from all the six participants with only one varying factor, the difference in the language used to articulate the feelings, experiences and the perceptions. The slight difference with the six participants were linked to either memory about their schools visits to the Observatory, attending an event organised by the Observatory or having school-going family members. Their view of the role of the SAAO in the community was consistent on science communication with learners while none existent efforts in the community after the big launch of the Southern African Large Telescope (SALT) in 2005. Also, the socio-economic issues linking to job creation had divergence, some saw the South African Astronomical Observatory (SAAO) as an employer during the building of SALT which gave them hope for future employment, but the SAAO could only retain a few employees and only a handful were hired later as general workers for the site maintenance, cleaners, kitchen staff and tourist guides.

Since Sutherland falls within what the South African Government has classified as Astronomy Geographic Advantage (AGA) (Gazette, 2007), one participant expressed a concern about an occasion when Sutherland Municipality would decide to expand the town. Such an expansion would result in a stiff negotiation with the Observatory and this may not go well since the AGA Act has limitations on what communities around astronomy facilities can do, the gazette is in favour of astronomy with no community needs consideration. Additionally, there is a yearning for astronomers and engineers to not only come from outside Sutherland rather they should be groomed through science engagement programs in schools where learners get science engagement intervention by the SAAO. At the moment according to one participant, astronomy continues to be esoteric and abstract to learners because most of them only hear about “observation of stars” in reality they do not have an idea of what it

entails. Even the pictures of the cosmos that are shared with them do not render enough imagination for them to consider astronomy as a worthwhile field.

In summary, the perception is the same across all participants, the difference is in the closeness and link to the issues currently pervading the community. As mentioned by some, the SAAO is seen as detached to the community when compared to the community involvement of the Windfarm project. Three participants talked about the engagement with the Windfarms, citing that the communication lines are easy to navigate through a steering committee, something that does not exist with the SAAO. One specifically acknowledged, although the Observatory while not visible in the community, at school-level they would do anything. The relevance of the statement was, a mathematics teacher for both Roggeveld primary and Sutherland high school had been employed during the data collection period in March 2020.

- **Hermeneutics**

Using hermeneutics as a guide to understanding the meaning each individual makes about the events around the SAAO from the launch of SALT in 2005 till now. This period was a turning point for science communication and engagement at the SAAO because their first outreach department, the SALT Collateral Benefits Programme was established around this period (SAAO, 2021) for the purpose of interfacing with the general public and tourists who would visit the Observatory. This type of edu-tourism was to play a significant role in public understanding and engagement with science (Ingle, 2010:97).

The language used to divulge the experiences expresses missed opportunities as well as the desire and curiosity to comprehend what is done at the Observatory. A science knowledge expectation was not met and continues to be unrealised. Some participants talked about relying on friends to get an idea of what really happens at the Observatory or what different telescopes do at night. The science communication scholarship says science is driven by a need for democratisation and that can be attained through engagement with the public (Weingart & Guenther, 2016:2). Additionally, Science is essential to our knowledge society because it affects people's everyday lives in differing ways. Many vital decisions humanity makes are rooted upon

comprehension and evaluation of scientific evidence, claims and arguments (Hendriks & Kienhues, 2019:29).

Getting close to the SALT is a privilege reserved for tourists even as a main attraction of the town. While the Observatory heralds itself on contributing to astro-tourism by the mere presence of the Southern African Large Telescope, the community has mixed feelings about it since their benefit is simply providing labour to guesthouses or B&B they could not afford to buy. There is no tourism value chain established for communities that do not have the means to own big establishments. A tourism value chain means involvement from the beginning at four levels constituting the design of the tourism product and services, tourism agents and tourists (Song, et al., 2013:16), which simply illustrates the participation and identification of entities that contribute to the creation value of the end-product for the destination. As an economic fortification, tourism in South Africa and worldwide is considered a catalyst for development linked to job creation (Kontsiwe & Visser, 2019:1335). Based on the numbers collected by SAAO, each year about 13000 tourists visit Sutherland and SALT. The Observatory also hails itself for training and retaining five young unemployed youth as tourist guides (Manxoyi, 2016:35).

So many years later the connection is still not there, since none of the participants mentioned a turning point of communication or reflection, their view still remains that the launch was to some “a circus” and “a lot of talk”, engagement has still not improved. It is worth indicating that the views expressed by participants are at odds with the position taken by the Department of Science and Technology on science engagement, where they expressly see science communication as crucial in promoting science engagement with communities and developing a culture of talking about science with communities (Department of Science and Innovation, 2015:3). Also the NRF Act 23 of 1998 makes this assertion of, “Supporting and promoting public awareness of, and engagement with, science” (NRF, 2019). This evolution assigns two prominent roles to citizens, “as assessors of technology and co-producers of knowledge” which redefines science communication practice from doing it for science to doing it for democracy (Bensaude-Vincent, 2009:363). Grunig and Grunig (1992:308, in Cooper, 2008) make a case for two-way symmetrical model as an ethical method, while also adding that the “model is most effective in meeting organisational goals”. The goal of

a scientifically literate society is the position taken by the current government when they drafted the 1996 White paper.

4.3 Theorisation of Results

Once the relationship between all the general themes was selected for vigorous analysis the next process entailed going back to the transcriptions to ensure that data correlated. The ultimate step involved interpreting themes into a narrative account with a focus on expressing shared knowledge and background between and across all the participants (Smith, et al., 1999:231-235). The narrative account of themes is demonstrated below.

4.3.1 Themes from the data analysis

Role of corporate communication	Stakeholder/Community Engagement	Relational communication
Main Theme : • Poor perception of the Observatory • The Observatory doesn't use all the communication avenues available to them.	Sub-theme: • The community doesn't feel connected to the Observatory. • Misalignment of expectations and values	• Poor understanding of the community. • Job creation or opportunities • No direct contact to facilitate communication • A desire for broad science communication/engagement beyond the school level. • Outreach or science engagement then what

4.3.2 Role of Corporate Communication

Corporate communication as a management function that lays its claim on having a wide range of communication activities in an orderly system, (Jackson 1987 in Christensen & Cornelissen, 2011:356) does not seem to be successful or practiced at SAAO. Most of the participants have lived in Sutherland long enough to remember the arrival of the first two telescopes in the 1970s thereafter the building and launching of the Southern African Large Telescope (SALT) in 2005. The first participant was in school when the observing site in Sutherland was founded in 1970, the school even

took them to the Observatory to see the first two telescopes that were the foundation for the many more that came years later. All of the participants attest to being invited to the launch of SALT except for one who was still a baby.

The launch of SALT was a big event for the Observatory and the Sutherland community at large with the end result of “putting the town on the map.” To communicate the event, the Observatory formed an alliance with the municipality, through the municipality they were offered community development workers who were deployed into the community to deliver invitations door to door, to encourage community members to attend the event activities which were mostly contained in the Sutherland rugby field save for the official SOD turning and the launch which were held at the Observatory site with only official dignitaries. Impressions from participants are captured using their exact words.

Participant 1: *Yeah, there was a big circus in town, it was ministers. I don't know who else was here, helicopters, and police choppers were here. So to me it was a circus.*

Participants 2: *I grew up here you can say that, I started here at the school, I think grade 1 or 2. I was here when WBHO built SALT, I can still remember that. To be honest that time when you are so young, you don't actually think about it, because you are just growing up you are in Sutherland*

Participant 3: *Oh, it was a big thing in our community except that our community know about the Observatory but when SALT come, it was a big thing. Everybody was talking about the SALT and how big it is and how great it can be for our town and everybody wants to talk about, you want to know, it can create jobs and it did create jobs because when they start to build SALT they used or take people from the town as general workers to help build SALT at the Observatory. So it did give us, from the start it helped out people economically – they helped our people where they used general workers. So, it was a big event 2010....2011 (could not remember that it was 2005) I was my year, I matriculated then. It was a big event, everybody was happy. Firstly, it was the opening of SALT, the president is here in Sutherland and I know that big programme was at the high school ground and it was full of people.*

Participant 4: *Yes, I can, I remember we were in the rugby field that day and the people came and they talked a lot, and they went up to the Observatory to go and give – what is a graaf in Engels, when they go and give the first spade.*

Participant 5: *I was too small. Only the big guys were there to see the big telescope, yes.*

The first participant argues that the event was a “circus” and more could have been done with the money, because the Observatory according to participant 1 does not understand the community. They chose to have a huge event that had no meaningful impact on the community. Other remember the event but cite age as a consequence for not paying much attention, while participant 3 made a point of referencing what was the benefit to the community.

The literature argues that public relations as a management function plays a pivotal role in drawing up management strategies that offer direction to organisations on how to behave within their operational environment. Slabber and Barker (2014:72) vouch for a two-way symmetrical practice of corporate communications to ensure successful organisation stakeholder relationship. Given the views of the participants, perhaps the experience would have been richer had there been a consideration of community interests during the time leading up to the event.

The concept of dialogue in public relations is not new, Kent and Taylor refer to Grunig's 1992 conceptualisation of public relations as a theory that supports building of relationships with publics who either impede or strengthen the worth of the organisation to meet its mission. Moreover, the dialogic theory in public relations is a foundation for building relationships that serve both the organisation and its stakeholders. As such, immense emphasis is placed on the role of communication as a tool for negotiating relationships (Kent & Taylor, 2002:21).

4.3.3 Stakeholder/Community engagement

The Sutherland participants all agree that the SAAO needs to not only care about learners, instead they should include the community too. Adding to that is a need to bring the community closer and more knowledgeable about the work done at the Observatory, at the moment some talked about getting information second hand from

their friends who work at the Observatory. To amplify the importance of science for society, during the launch of the Southern African Large Telescope (SALT), former President Thabo Mbeki in his speech, talked about the second liberation of “humanity from blind action informed by superstition that derives from a failure to fathom the regularities and imperatives of the infinite natural world” (Polity, 2005: 2). Science is supposed to be the best achievement of our culture, thus people ought to know about it. Conceptually, some scholars argue that comprehension of science communication in a cultural context could help the public to be both analysts and practitioners. This idea of studying and doing public communication might be useful in focusing on meaning formed through stories about science. This process may inspire people to query not whether truths are shared successfully, but what is being strengthened through occasions of public storytelling about science (Davies, et al., 2019:4). The prosperity of science communication is driven by the need to democratise science which denotes engagement with the public and that scientists have to interact with laypeople (Weingart & Guenther, 2016:2). Also, one of the functions, powers, and duties of the National Research Foundation of which the South African Astronomical Observatory is facility of, is to make scientific knowledge and technology available through any medium (Act 23 of 1998). The King Report III (chapter 1, 2009:20) advocates for good corporate governance, this outlook is supported by ethical leadership which supports the importance of stakeholder interaction as part of responsible leadership. In addition, the organisations triple bottom line (economic, social and environmental) performance encourages organisations to conduct business in ways that its assets flow to multiple stakeholders (Javed, et al., 2019:503).

Participant 1: *Well ok, I have got more knowledge now about it than the normal people in town because my friend was working there, he showed me more: this planet is here, that planet is there and that star is there and that cluster of stars is there and all that.*

The bus tour initiative from Sutherland to the Observatory was not the original idea of the Observatory to bring the community close-up exposure to astronomy, it was a response to a television programme FOKUS/FOCUS that came to Sutherland and asked community members about the Observatory, many of them could not point to the right direction where the Observatory is located, thereafter the Observatory had a

bus tour for the elderly to Observatory. Here are some of the responses from the participants regarding the matter of community engagement:

Participant 2: *Yeah, I remember that that was mostly for the elderly people but only for a short period of time. I also know that so I can remember that yes. The reason they did that was because, I think a year before that on Fokus (SABC 2 show) they were here and they interviewed people and people say, no SAAO (Sterrewag is this side, no Sterrewag is this side) is this side, I only heard about Sterrewag, some people said, I don't know where it is, I don't know how it looks like.*

Participant 3: *Yes, I know about what the Observatory is doing that they are looking at the stars, they collect data but at that moment it wasn't like you/we had that bigger information, you have a little because you learned at school about astronomy if you have science but at that moment I have a little bit of an idea of what is SALT is...what they are doing at the Observatory.*

Participant 6: *No, no there was no change that they recognise us. They just recognise us when there's dignitaries coming because the last time, last week, when the premiere come to visit Sutherland, the same Observatory did have a program to meet the premiere but because I was the ward councillor. The day before the premier came I was talked the e-mail from the mayor, saying no I am going to the Observatory because I need to meet the premiere because I am actually the ward councillor – they (the Observatory) was trying to not involve us in the same process but as a councillor, I just went to meet the premiere and he was glad.*

Stakeholder engagement according to the two-way communication model could dissuade issues evolving into a crisis or stakeholders feeling inadequately considered causing reputation risk (Grunig & Grunig 1992:308). A recent noteworthy incident in astronomy is currently unfolding in Hawaii regarding a new telescope, where the indigenous people are opposed to the construction of the Thirty Metre Telescope (TMT) on Mauna Kea. The community has taken the Hawaii Department of Land and Natural Resources to the Hawaii Supreme Court. Some community members argue that the standoff is seen by some as a clash between cultures of different values. The issue has caused a rift between science and the general public (Cabiglio, 2016). Jessica Dempsey who is the deputy director of the East Asian Observatory operating on Mauna Kea, was quoted saying, "Gone are the days of the scientific conceit of being separate from the community. Astronomers really have to do more

contemplation about where they are in the world, and about the social context and impact of their work” (Witze, 2020:457-548).

With continuous communication relationships are negotiated and renegotiated and constantly explicated. Over time certain patterns emerge giving insights to the observer or participant into the relationship. In relational control, the notion of describing or explicating relationships has many purposes, following scholars like Watzlawick, Beavin and Jackson (1967) interpersonal communication behaviours can be categorised in three ways: one up – a behaviour that declares the authority to determine a relationship, to be the one in control. One down- the behaviour that agrees to the relational interpretation of one’s partner, a compliant behaviour. One across – a behaviour that stretches the dialogue with no attempt to be commanding or authoritative or passive (Courtright, 2015:5).

In the classification of stakeholders, the Sutherland community falls within what Mitchell et al (1997:875-876) call the discretionary stakeholder, a stakeholder who has legitimacy nonetheless no power to exert and no urgency in their claim, for this reason, they are completely dependent on the SAAO’s benevolence instead of putting pressure. Hence many of their well-articulated expectations may never be dealt with, perhaps when they come to the fore, they will have evolved into issues. This benevolence is also not a positive look to the Observatory, since relationships should be cultivated as well as nurtured so that they benefit both, therefore as one participant said, there needs to be a steering committee where the community could have a dialogue with the SAAO management. Steyn and de Beer argue that the success of reflective public relations is evident in the feedback loop between society and the organisation through the two-way symmetrical approach (Steyn & de Beer, 2011:11).

4.3.4 Stakeholder Expectations Sutherland

The South African Astronomical Observatory prides itself on contributing to astro-tourism development in Sutherland from a few bed capacity to 300 currently. This is a spinoff from what the participants kept reiterating “*SALT put Sutherland on the map from a town that was never shown on the weather map*” to one that no longer relies on Calvinia for its weather forecast. This is followed by expectations of jobs and business opportunities. The business opportunities only translated to a proliferation of guesthouses and a hotel as well as tourism popularity of the town with no other value-

chain benefits for those with limited financial muscle to buy big establishments, like B&Bs or guesthouses. Astro-tourism according to (Jacobs, et al., 2019:5) is an inherent cornerstone to socio-economic plans that intend to drive tourism-led economic growth in a destination. Tourism is positioned as a catalyst for development and it is linked to job creation and economic fortification in South African and worldwide (Kontsiwe & Visser, 2019:1335). The SAAO on the other hand talk about 13 000 tourists who visit Sutherland and SALT, they also hail themselves for training and retaining five young unemployed youth as tourist guides at the Observatory (Manxoyi, 2016:35).

The community is adamant in their view that what could be attributed to the Observatory is its outreach efforts in schools which is supported by all participants since some of them at some point during their schooling had visited the Observatory and now as community members recognise the continued support the schools receive from the SAAO. One participant even said *"I know is that the Observatory when, especially when the schools ask for something they didn't say no, they assist our schools. It's up till the schools but the community outside is suffering because they didn't any assistance from them, but generally they about schools whatever they ask even computers...."*

Even some local businesses do not see the Observatory as a major contributor to the economy of the town, some had hoped that the Observatory shopping would be done in town, yet the Observatory has shopping days for their staff whereupon their staff shop elsewhere and even the regular transport to and from Cape Town only stops in town for a few things, like snacks as articulated here by one participant,

Participant 1:*"Ok, I thought it was, it should have been an injection into the town for more people to come. And...ok there are people coming here but through 23 years or the last 23 years the visitors come direct to the Observatory, they visit the stuff, they climb in that bus they come- they go away. There are not very much people that go through the town, and... ok maybe a packet of chips and a cool drink here and there but not all of them, and they have got stuff there also they sell to people. So they don't really care about buying in town and I don't think it is really....that's what I thought it would be and I don't think it is like that".*

Scholars like (Jacobs, et al., 2020:5) argue that tourism in Sutherland is intensified on account of better individual stakeholder relations, tourist guiding, and revamping of the quality of the roads going to Sutherland. They also mention the arts and crafts that are made by locals for sale to tourists, selling of fresh produces as well as tourist transfer services (Jacobs, et al., 2019:6) all of which constitute the tourism value chain. It seems while there was foresight to create a tourism product that would engage the general public through the SALT Collateral Benefits Programme (Ingle, 2010:97), the Observatory did not consider the importance of working together with the town to create a destination-focused end-product founded on all the elements of the value chain (Song, et al., 2013:16). Regarding tourism transfer of support of Small, Medium, Micro Enterprise (SMME), participant 2 had this to say: *“but from an SMME side if they can tender out jobs for a year, let’s say for maintenance, cleaning or whatever, then from an SMME you can create jobs for people, you see and that is the main thing at the moment.”* The absence or need for jobs/job creation could take away the will and desire to collaborate with the Observatory should there be an occasion when the SAAO needs the community not just to look like they work together when government officials visit, but in a more meaningful way, like issues of light pollution or dust that could render astronomy research impossible. While they are protected by the Astronomy Geographic Advantage Act, adherence and upholding of the Act are highly dependent on the will of the people which hinges on good relations.

4.3.5 Relational communication using Science communication

The meaning of alignment is expressed comprehensively by Fumburn and Rindova (in Christensen & Cornelissen, 2011:391) when they say, transparency is the “state in which the internal identity of the firm reflects positively the expectations of key stakeholders and beliefs of these stakeholders about the firm reflects accurately the internally held identity.”

The DSI Science Engagement Strategy relies on four major strategic aims which are geared towards popularising science, engineering, technology and innovation as appealing, relevant, and accessible to improve scientific literacy as well as to stimulate interest in relevant careers. Their wide-ranging category initiative are science for the public, science for education support and the promotion of careers in science. The second strategic goal is to cultivate a critical public that keenly engages and

participates in the national dialogue of science and technology to benefit society. These dialogues would be supported by DSI through engagement with major stakeholders around issues relating to development disputes. The third aim is the promotion of science communication that improves science engagement in the country.

The Sutherland participants had this to say about science communication after the SALT launch,

Participant 3: *With the community about the Observatory or SALT? Ehh...not much communication with the community, maybe if like, they have programmes at school – they have contact with the children, like children have science, they have engagement with the science children – they want to give them a broader perspective about what is the skies, but not communication-wise there but not that it must be with the community and they take them to the Observatory at some point in the year.*

On the question about what the Observatory/what is its function:

Participant 4: *Silence.... (Then) Astronomical stuff. Laughter.....Ok, like usually most of the people, they get a lot confused with the Sutherland planetarium and the Observatory, so when they call I have to explain its two different places. Then they ask what's the difference, for me it is: at the Observatory, they tell me you get to the visitor's centre where there is a tour guide they tell you which one is warm to where the cold, they explain to you about the infra-radio and stuff and stuff.*

The DSI White Paper 1996 makes provision for stakeholder inclusion to establish collaborative relationships and interactions for the benefit of the people and the nation. The same document talks about the research and development as a vehicle for meeting basic community needs at their level (Department of Arts Culture Science and Technology, 1996:-3-5). Through public campaigns people should be conscientised about the huge role science plays in their lives which then should translate to an appreciation of their role in science (Manzini, 2003:194). Science in society plays a pivotal role of being the final source of trustworthy information at least in theory. Engagement with the public has led to democratisation of science implying that scientists have to get out of their comfort zone and engage with the public; in South Africa this has created a huge opportunity for growth in science public relations (Weingart & Guenther, 2016:2). Stakeholder legitimacy is understood as meaning

it is “legitimate to spend resources” on stakeholders irrespective of the appropriateness of their demand (Phillips, 2010:120).

The Department of Science and Innovation (DSI) believes that effective science communication would lead to science engagement, although the profession is acknowledged as underdeveloped as a discipline and medium in South Africa. Since there is already a confusion about the fields of astronomy and domain belonging based on the participant 4 comment, strategic aim four of DSI which talks about the profiling of South African science and science achievements locally and internationally to showcase the contribution to national development and global science with the hope of increasing their public standing, should be a place to begin for South African Astronomical Observatory. All these goals would be possible with the coordination of science engagement initiatives across many stakeholders including recent revision of the National Research Foundation (NRF) Act to legally include science promotion and engagement as mandate. The role of human science research is considered essential and enriching in understanding the social, economic and cultural well-being. Among the fields considered to be useful in helping with the effort of engagement with the public is corporate communication, its function would be to assist with the messaging by organisations internally and externally (DSI, 2015:3-13)

4.4 Summary

The themes from the transcriptions allude to a need for communication efforts to either be intensified or established in certain respects, like the community engagement where there seems to be a deficit as well as a curiosity about science/ astronomy that is not met. Also, the issue with value chain in both tourism or in general business engagement, there is an expectation that was created by the presence of the Observatory which made the community assume there will be an “injection” into the community and town that is more than what has been attained through employment and being a major tourist attraction. Similarly, there is hope that all the science engagement done with schools will lead to career pathing for learners from Sutherland schools, especially now that there is a mathematics teacher to complement the education offering in the town. The DSI’s consideration of corporate communication as an important in message formulation to the general public is quite and imperative step in assisting astronomy institution to engage meaningfully with the public and

making them understand how science influences their everyday lives. Also that science culture can co-exist with the social culture.

Chapter 5: Conclusions and Recommendations

5.1 Introduction

This chapter concludes the study that investigated perceptions of the Sutherland community about the South African Astronomical Observatory using public relations strategies and the dialogic framework to understand relational communication efforts that exist between the two parties.

5.2 Methods and Procedures

It is acknowledged by du Plessis that the previous systems, colonisation and apartheid managed to erode the African ethics, values and knowledge systems – African ethics and values which are founded on the principle of *Ubuntu*. *Ubuntu* is premised on the collective good of everyone with proper consultation (du Plessis, 2017:2). This principle is no different to the dialogic theoretical framework used in this study which also emphasises the importance of the two-way symmetrical communication (Grunig & Grunig, 1992: 308). Given the curiosity in science from the responses of the Sutherland participants, scientific research being the preserve of the few elites within academic walls (Mouton 2006 in du Plessis, 2017:3) has not departed from this purview even though there are policies like the Department of Science Innovation (DSI) science engagement strategy encouraging science engagement to improve science communication with the public (Department of Science and Innovation, 2015:3). Local knowledge systems were not recognised and the notion of colonial knowledge superiority remained, hence the exclusive science communication deficit model was ushered in (du Plessis, 2017:6).

The moral of communication necessitates that public entities engage in two-way symmetrical communication with citizens. The participation assumption suggests that public officials shall accept counsel from affected parties and include them in defining policies and service. Expert-public connection in science and technology engagement is premised on three models: "the dissemination model (frequently called the deficit model), the dialogue model and the participation model" (Bucchi 2009, Trench, 2008) as policy models they are synchronised policy tools (Hetland, 2014:6).

For sustainability organisations have to realise that a one-mind focus on economic view alone can only prosper for a short while, the ideal is to have a three feature focal point where environment, economic and social are fulfilled synchronously (Steyn & Niemann, 2010:117). Robert Phillips explains mutually as a cooperative scheme where all parties contribute with the hope of getting equal rewards while also understanding that losses will be shared. Likewise, in a scheme like this anyone who has accepted the benefit is entitled by moral imperative to do their part as well as obtain something (Phillips, 2010:86). Mutuality means a collective benefit.

5.3 Discussion

To understand the relational communication that exists between the Observatory and the Sutherland community, the study is premised on these research questions:

Main research question explores: What kinds of relational-management practices exist between the Observatory and the Sutherland community, to understand the importance of involving surrounding communities in science and community engagement using public relations management process to establish relations and mutuality

Sub-questions:

- What is the nature of the relationship between the South African Astronomical Observatory and the community around their research telescopes specifically from the notion of the Observatory's stakeholder management plan?
- What does the Sutherland community know about the Observatory, and how would they like to become involved?
- Why is the relationship between the Observatory and its immediate surrounding community important and critical in the process of strategic public relations in relation to reputation management and branding?

Using the lens of the strategic role of public relations to bolster organisations to conform to their societal and stakeholder environment. The study is investigating perceptions of the Sutherland community about the Observatory with a view of understanding the extent to which the Observatory engages with its major external stakeholder - the community located 15 kilometres away from the hub of scientific research. The aim is to:

- To investigate community perceptions about the South African Astronomical Observatory (SAAO)
- To explore the nature of stakeholder engagement/communication that currently exists between the astronomical observatory and the Sutherland community
- To understand if a collaborative relationship could be established between the astronomical observatory and the community around it

As a management function public relations is supposed to be instrumental in the formulation of management strategies that give direction to how an organisation conducts itself within its operational environment. Van Riel (1995:142 in Steyn: 2000:2) frames the purpose of corporate communications as a consolidated approach to all communication generated by an organisation aimed at the desired groups. Likewise, the development of a corporate communications strategy benefits the organisation in dealing with issues affecting their stakeholders. Within the corporate communications strategy is a detailed list of all stakeholders and their functionality within the organisation, the issues that may arise should the stakeholders not be addressed, accordingly, the benefits for both are also highlighted (Steyn & Puth, 2000b:66).

5.3.1 Summary of key findings

At the start of the Sutherland Observatory research site in 1973 B.J Voster talked about an anticipation to enter into a collaborative relationship with the overseas astronomers and wished that many of them could come and work on the South African shores to advance astronomy at our universities. The results from Sutherland suggest while there is astronomy outreach in schools it lacks career pathing for learners who seem curious about the field of astronomy and engineering. Their parents have a desire for astronomers and engineers to come from their own community, for them that would be a significant contribution by the Observatory into the community. As yet, even the community development centre that is heralded to provide community centred services (Manxoyi, 2016:35) to Sutherland does not seem to provide learners with the afterschool program that ensures better outcomes for learners. Even the community members complain about the poor services they get from it, like paying more for items that are cheaper at the public library.

The data indicates the perception the community has of the Observatory is of an institution that is distant from them, it does not help that there is no one whom the community could share their interests and expectations with. All they get from the Observatory are requests to participate during the government official visits to SALT. At no point are these visits arranged inclusively where community inputs are taken into consideration so that when the MECs or any official who visits could make time to discuss challenges within the community. The Observatory only calls on the community to appear to have a good relationship with the Sutherland community. The tour bus that was a reaction to a TV programme Fokus also stopped after three months, but that does not mean the community stopped being curious about astronomy research and discoveries. As mentioned by some participants, what they know about the Observatory is information shared with them by their friends, otherwise they would not know anything about the work done at the Observatory. Since the Observatory is protected by the Astronomy Geographic Advantage Act 2007 there might be a serious issue with Sutherland community in the event that the municipality wants to expand the town. The Act has a list of limitations for anyone who lives close to an Observatory, like, 3 kilometres within the inner radius and 75 kilometres of the outer radius of the Observatory is reserved for optical astronomy – development comes with light pollution as was the issue in Cape Town leading to the founding of the Sutherland site.

5.3.2 Interpretation of Results

5.3.2.1 Community Engagement

At the launch of the Southern African Large Telescope, the former president of South Africa, Thabo Mbeki talked about the second liberation of humanity and saving humanity from “blind action informed by superstition that derives from failure to fathom the regularities and imperative of infinite natural world.” The Sutherland community wishes to be part of the information revolution and to be scientifically literate in order to participate in the knowledge economy of the country yet their expectations and interests are not met. They wish to benefit from the social knowledge system which is so well accommodated in the Department of Science Engagement Strategy (2015:6).

Science is supposedly the best achievement of our culture, thus people must know about it. Some scholars argue that theoretically the comprehension of science

communication in a cultural context could help the public to be both analysts and practitioners. The notion of studying and doing public communication might be useful in focusing on meaning formed through stories about science. This process of knowledge acquisition may inspire people to query not whether truths are shared successfully, but what is being strengthened on occasions of public storytelling about science (Davies, et al., 2019:4). The prosperity of science communication is driven by the necessity to democratise science which symbolise engagement with the public and that scientists have to interact with laypeople (Weingart & Guenther, 2016:2).

The theoretical framework for the study asserts that dialogue communication is considered an ethical way of communication on account of its service at alleviating power relationships, values individual decency and self-worth while also involving participants in dialogue and decision-making (Taylor & Kent, 2014:388). The lack of communication between the Observatory and the community could be needing a dialogue and as Noland and Phillips argue this is requisite for organisations to commence courteous, honest and meaningful multilateral communication with their stakeholders (2010:48). Achieving a balance for both party's interests is well within the management ability of organisation's stakeholder relationships by public relations (Ledingham, 2006:412). The role of public relations is seen as a "management function that establishes and maintains mutually beneficial relationships between an organisation and the publics on whom its success or failure depends" (Cutlip et al. in Steyn 2000:3).

Central to the public relations function is mutuality of relationships with publics in order to achieve success or failure on the bases that communication efforts are directed at the correct stakeholder. Consequently, the importance of effective communication for each stakeholder is key. These participants in their own way articulate the need for communication specifically directed at them. **Participant 4:** *If SALT found something and they come and explain it maybe more of the children will be interested in astronomy. You see if they can see what actually they can achieve and what they can see and what they can find maybe like that there will be more for the children to see and to do.*

Participant 5: *"astronomy for itself", because they doesn't help the people to do astronomy and stuff that's why. They only think of themselves.*

Participants 3: *I would say, it must be astronomy for astronomy and for the people because my reason for that is, we approach our children to say you must go and study science that kind of stuff, so we want to have our children, we want to have our children, we want to see our children from this town even if it IT or electrical or scientist but our children from this town must go and study and they must be the people or the next generation to go and work at the Observatory.*

The field of relational communication immensely recognises the concept of dialogue as a framework for proposing ethical and meaningful relationships (Kent & Taylor, 2002:22). Public Relations according to Steyn and de Beer, serves the interest of society as well as the organisation to achieve a win-win situation when the development of emergent and deliberate communications strategy forms part of organisations reporting (2011:4). Mutuality is a cooperative scheme where all parties contribute with the hope of getting equal rewards while also understanding that losses will be shared (Phillips, 2010:86). In a mutually beneficial relationship not only one party enjoys the benefits.

Historically, organisations used to be very small and existed within communities where they also had a personal stake, thus it was simpler to build relationships. Once they became bigger, they started depending on media to form symbolic relationships focusing on their image instead of behavioural/personal relationships (Grunig, 1993:122). In the relational nature of reputation, organisations reputations which are formed largely on perceptions are owed to them by their stakeholders (Riad Shams, 2015). Since stakeholders are active, engaging and equal participants of the unfaltering communication process, implementation of the relationship-building approach needs re-imagination of the ways in which public relations considers stakeholders (Bruning, 2002:40). The Observatory in this case as data indicates has to reimagine the way to engage with the Sutherland community and be open to listening to the community on how to meet their needs. The relationship has to be established on the grounds of science communication since this is the commodity of trade. Additionally, one of the functions, powers, and duties of the National Research Foundation is to make scientific knowledge and technology available through any medium (Act 23 of 1998).

Citing Grunig and Repper (1992:96), Slabbert and Barker emphasise the momentousness of the involvement of corporate communications professionals in strategic management to provide environmental scanning expertise and inputs to express the organisational mission and objectives, which offer direction from the organisational viewpoint (Slabbert & Barker, 2014:70). This approach would be a move away from press agency which Eric Goldman termed “Public be fooled” to “public be informed” denoting public information (Grunig, 1992:287). Thus the role of corporate communications should be applied from the two-way symmetrical communication standpoint to attain successful organisational relationships (Slabbert & Barker, 2014:70). Otherwise a one-way communication is transparent even to participants as only serving the organisation as noted by **participant 6** : *They just recognise us when there's dignitaries coming because the last time, last week, when the premiere come to visit Sutherland.*

Participants 7: *Over the years SALT has become distance from the community.*

The Department of Science and Innovation strategic aims takes a strong stance on science engagement with citizens, for instance they see promotion of science communication as a way to improve science engagement in the country.

Naturally, effective science communication could yield much-needed science engagement, even though there is also acknowledged that professionally the field is underdeveloped as a discipline and medium in South Africa. To understand the work done by the Observatory, as DSI aims state, is imperative to profile the South African science and scientific achievements locally and internationally to showcase the contribution to national development and global science with the hope of increasing their public standing. All these goals should be possible with the coordination of science engagement initiatives across many stakeholders including the recently revised National Research Foundation (NRF) Act to legally include science promotion and engagement as mandate. The role of human science research is considered crucial and enriching in understanding the social, economic and cultural well-being, similarly, the provision of the context in which the policy, innovation and technology can progress. Among the field considered to be useful in helping with the effort of engagement with the public is corporate communication, its function would be to assist with the messaging by organisations internally and externally (DSI, 2015:3-13)

5.3.2.2 The perception is that the Observatory and strategic issues management

The issues management role of the organisation and public relations demonstrates “openness” or “closedness” of the dominant coalition (Lauzen & Dozier, 1994:165). The dominant coalition is a group that holds the power-control view in the organisation, it constitutes top management and other individuals who set goals for the organisation as well as the values behaviour of the organisation (Berger, 2005:6-7). Given the data results, the Observator would have to craft stakeholder inclusive strategies that would offer stakeholders the opportunity to be listened while at the same time taking responsibility to consider them (Slabbert, 2015:44). The test of the openness of dominant coalition of SAAO would be evident in the way they consider the data results from the community.

Similarly, the way issues management would be dealt with at as an executive task of strategic public relations that handles problem solving, organisational policy and long-term planning as well as management strategy would then communicate the strategy internally and externally (Bowen, 2005:191). To be useful to the organisation, issues management has to map the environment within which the organisation operates, the mapping should be indicative of the symbolic depiction of the environment to be worthwhile to management in strategic planning. Mapping of issues like this : *I mean you can say SAAO is in our community – is in Sutherland, we are neighbour but I don't think they have done anything, NRF especially in this community which they can say, we have done that for these people or we helped young people with certain things, you see. Huh no man, huh, huh no, what they are doing there it's only for them to be honest. It's no impact to the community, that I am being honest, I don't badmouth them but no...*

The mapping is conditional on two attributes, the first purpose is for it to be appropriately projective –suggesting that it should foresee surfacing public issues prior to becoming clear and existent threat to organisational goals. Also, a map is properly projective when its symbolic representation is receptive to weak signal issues (Ansoff 1980 in Lauzen & Dozier, 1994: 165). The corporate communication socialisation of stakeholders into the organisational culture allows for creation of meaning. Organisations could facilitate the formation of mutuality as well as legitimacy to shape long-term relationships that fashion the organisation's image and reputation

(Mohamad & AbuBakar, 2018:242). In this regard, legitimacy can be obtained from establishing strong lasting relationships that are essential for observatories to achieve stakeholder support (Steyn, 2000:2). Ultimately, stakeholder legitimacy sprouts from the need to stay relevant and competitive on the strength of reputation and issues management. As a start issues management would have to deal with views like this from **participant 1**: *I think it is for people but it is closed, I mean the guys that are working there is paying for the time on the telescope. So it is more involved for the paying customer, obviously, but they do reach out to the community in some cases for stuff.*

Identification of issues warrants naming, framing and claiming each signal found while scanning the environment. Thereafter, there should be a determination of whether a concern or issue prevails that might hinder the organisation from attaining its strategic business objectives. Normally, the framing of each issue controls its potential impact (Heath, 2018:10). Closed organisation systems may arrange internally directed issues management systems that work mostly on symbolic roles legitimising decisions made by the dominant coalition placing organisations as environmentally accessible while the opposite is true. The Stakeholders are provided no obvious or existent linkage to the organisational sustainability and growth (Lauzen & Dozier, 1994:168). The view from **participant 6**: *They just recognise us when there's dignitaries coming because the last time, last week, when the premiere come to visit Sutherland.* This might be an indication of a symbolic role played by the Observatory to seem like that are linked to the community while they are not.

Bowen argues that the crucial role of public relations towards organisational effectiveness can be assessed in the relationships established and upheld by the role (2005:199). In organisations where there is no regard for public relations, the organisation positions public relations as an office-holder rather than useful, and only used it as a mouth-piece for word out and always on standby for its technical support. What follows is issues management and public relations mostly carrying out symbolic functions and administrative roles with no strategic action (Lauzen & Dozier, 1994:169). Berger advises that public relations managers need to be part of the dominant coalition to positively sway organisational choices, ideology and practices. In this way, public relations would assist the organisation in social responsibility

obligations management and building meaningful relationships with others. The ideal outcome is public relations managers who move up the ranks function on the fundamental principle of a relational or symmetrical (excellence) worldview doing what is right for the profession, organisation and society (Berger, 2005:8).

In summary the data indicates these concerns which affect both perception, lack of collaboration and relation communication from the Observatory.

- Lack of communication between the Observatory and Sutherland community
- Astronomy curiosity that is not met by science communication
- Poor use of the community centre to foster relations with the community
- A signal of issues that could erupt as a result of lack of enabling links between Sutherland and Observatory
- A one-way communication that serves only Observatory when the government officials visit Sutherland
- An expectation of town development created by some agreement that was signed between the Karoo Hoogland municipality and SALT

5.4 Major Findings

Contextualising Findings with Literature

Perception foregrounds everything about the place the South African Astronomical Observatory holds within Sutherland town and the community. Judging from the interview responses, the community of Sutherland were completely elated to have the Observatory build the big Southern African Large Telescope, for many reasons – injection in the town – simply put, job creation and opportunities, putting the town on the map for tourism. Suddenly Sutherland appeared on the weather map and positioned among mass media enthusiasts as the “coldest” snowy town in the Northern Cape, and a place for astronomy because of its weather and dark skies. Then as expressed by participant 6, the usefulness of community presence when government officials visit the Observatory to signal good relations and care for the community.

5.4.1 Perception as a reputation construct

Reputation management as a means for concretion of meaning between an organisation and its stakeholders is relational. Managing perceptions linked with stakeholders is crucial to managing reputation, both brand and reputation are

dependent on strategic communication to modelling stakeholder perceptions and ensuring that target groups view the organisation and its offerings in good light. The link means harm to one can weaken the other (Riad Shams, 2015:314-316).

The participants in their responses talk about the absence of community engagement between them and the South African Astronomical Observatory. It is their wish that a form of link could be established since at the moment there is no way to contact the Observatory and talk about their expectations or interests. The public relations view suggests achieving a balance of both organisation and stakeholder relationships through management expertise (Ledingham, 2006:412). The definition of public relations as a “management function that establishes and maintains mutually beneficial relationships between an organisation and the publics on whom its success or failure depends” (Cutlip et al. in Steyn 2000:3). Places it at the centre of concern expressed by participants especially since they have seen their interests considered by the Windfarm project that is currently working in Sutherland. Where there is a steering committee that meets regularly with the community and community needs according participants are addressed. One participant particularly mentioned that the Observatory refuses to help them even with the basic need of transport, when some old community members have business to do in the nearby towns, like Calvinia.

Another one mentioned the community centre which is the pride of the Observatory and a donation to the community by the Department of Science and Innovation as not really fulfilling its function of serving the community. For instance, at the community development centre one pays R5 to print a page no matter the colour, while at the public library one pays R1 for the same copy and they offer to e-mail you scanned colour copies. The purpose of the community development centre according to the SAAO website is to afford Sutherland community with meaningful intellectual property as well as provision of programs addressing socio-economic challenges afflicting the town. In the spirit of merit of relationships founded on from the organisations conduct instead of the messages churned by the communications practitioners (de Beer & Rensburg, 2011:214), somehow in its current form the community development centre within the community does not align with its purpose. The participants also poked holes at the afterschool initiative hosted at the community centre saying, the Observatory knows the community challenges with unstable home environments for

some learners yet the centre closes around 16h30 instead of allowing learners to study there till late.

Then the question is posed about the point of the school astronomy outreach interventions if they are not willing to see it through. The South African Radio Astronomy Observatory which is also located in Northern Cape with telescope covering a bigger area than SAAO had a different approach during the construction of the MeerKAT telescope which is a precursor to the big Square Kilometre Array (SKA) telescope. According their website, a composite of 25 students were given in-service training at the SKA from 2018 -2019 thereafter were guaranteed employment once they had finished their studies (SARAO, 2018). Elsewhere in the world, the Thirty Metre Telescope while having some issues with the community they initiated a \$1million fund, through a foundation called THINK ((The Hawaii Island New Knowledge) anticipation of the workforce that will be needed for high paying science and technology jobs in Hawaii and this was forethought during the construction phase of the next generation telescope (TMT, 2021).

5.4.2 Collaborative relationship and Strategic Issues Management

It seems the community is keen to collaborate or work with the Observatory to get exposure to research and discoveries. Some of the participants have an idea because of their proximity to friends who work at the SAAO, this could be extended to the community in way that is designed with their interests and expectations. At the moment they are not getting even what is considered translated scientific language where the public is assumed to be a passive audience consisting of consumers of science and technology (diffusion model). Since currently popularity of science uses one-way procedure of communication which entails “in the name of science” devoid of public interest (Bensaude-Vincent, 2009:362). Scholarship makes provision for three management methods that take place is the form of determination of stakeholders, the development of processes that acknowledge their different needs and interests, then the establishment and construction of relationships with them with the overall process based on the organisational objectives (Mainardes, et al., 2012:1862). The organisation objectives in the case places science communication as a compelling catalyst of science engagement (Department of Science and Innovation, 2015:3).

Also the community bus intervention which was a reaction to a TV show Fokus that visited Sutherland, while this was an excellent idea, the community was not comfortable asking questions and engaging fully with the content. A more engaged Observatory would have to a specific program for the community designed participatory with the community centred. Scholarship places relational communication deeply within the concept of dialogue as a framework for examining ethical and meaningful relationships (Kent & Taylor, 2002). Public Relations according to Steyn and de Beer, serves the interest of society as well as the organisation to achieve a win-win situation when the development of emergent and deliberate communications strategy forms part of organisations reporting (2011:4). Mutuality is a communal scheme where everyone contributes with the hope of getting equal rewards while also understanding that losses will be collectively shared (Phillips, 2010:86). In a mutually beneficial relationships benefits are shared.

The King Report III of South Africa states the importance of a stakeholder inclusive governance approach which acknowledges that the organisation has multiple stakeholders who can exert influence in the strategy achievements of the organisation and its long-term sustainability growth (IOD, Chapter 8: 2009:2). On occasion, it is not only communities who may influence the operations of the organisation rather the way in which the organisation conducts itself may affect its reputation (IOD, Chapter 8: 2009:3).

This view forms part of the central position of the King III report, which argues that the company's reputation is linked to stakeholder perceptions. Furthermore, the shaping of stakeholder perceptions is said to be premised not only on what the company communicates rather on its actions. Reputation is influenced by stakeholder perceptions, thus it is earned through relevance, and also reputation promotes connection and differentiation through authenticity (Riad Shams, 2015). By no means does this notion minimise the importance of communication in closing imagined gaps that may occur (IOD, Chapter 8: 2009:1).

5.5 Recommendations for further study

So far, there is limited research done on the role of Observatories in South Africa, in communities where their telescopes are located; or a well-defined role or benefit of

astronomy in society – what is their value proposition is to society. Research that is informed by the understanding of the role of astronomy in society would empower both Observatories and communities to understand their expectations of and from each other. What is evident and perhaps in abundance is research on science communication with comparisons to other countries since they have advanced this practice over years.

Recommendation for practice: There is a desire within the science policy and science engagement strategy of the Department of Science and Innovation to find ways to have an engaged society in science, future studies would have to look at the dialogic public relations and participatory co-creation of engagement. Already, corporate communication makes an accommodation of mapping who impacts or is impacted by the role of their organisation, this information would assist in designing solutions that serve communities. So far, science communication is done for anyone and everyone without really understanding exactly the society's curiosity or interest in astronomy. Again strategic public relations communication plans already consider direct efforts towards those who are affected by their organisation. A marriage between science communication and public relations strategies in order to realise the ideal of a scientific literate society, would be a study beneficial to astronomical observatories and other science institutions. The outcomes would give them a proper licence to practice as Steyn and Niemann postulate in the enterprise strategy (2014).

Recommendation for policy development – since the science strategy implementation plan from DSI makes provision for learner focused intervention, there should also be a policy framework specifically addressing skills development in science and technology in the communities where astronomical observatories are located. At the moment the policy is very generic. The DSI clearly mentions in the implementation plan a partnership between willing universities and high schools, Sutherland only has two schools that have recently employed a mathematics teacher via SALT, the opportunity for such a partnership is ripe now in order to realise the aspirations of the community of having “locally groomed astronomers and engineers.” This would also create an opportunity for Sutherland learners to easily join National Astrophysics Space Science Programme (NASSP) whose origins were to improve astrophysics skills in the country (NASSP, 2016-2021). The Thirty Metre Telescope

has done it in Hawaii (TMT, 2021) and on some scale, the SARAO seems to have done it with the artisan skills development (SARAO, 2018). This may create a place for the Observatory in society and specifically within communities like Sutherland.

Within the science communication strategy, there is a place for diffusion theory as a conversation opener which is coined “dialogue”, however if science is meant to empower and enhance critical thinking as well as create economic opportunities for communities, a participatory communication action that advances dialogue should be the cornerstone of every engagement. Science as Manzini posits should not wield power, instead it should be open to the cross-cultural (Manzini, 2003:192) co-creation of meaning where both parties participate in the design, development and implementation of interventions that affect communities. This way, industry innovation and development will be a reality. The European Union has in their Science, Research and Innovation Performance recognised the importance of designing a research and innovation policy that caters to sustainability, social, environmental and economic adaptation, in their view these efforts will ensure EU competitiveness. Their guiding foundational elements are co-creation - society centred work, diffusion - creating awareness across all societies, uptake - converting research into workable solutions with social and economic benefit, transformation – modifying the consumption and production and providing direction with research and innovation (EuropeanUnion, 2020:11).

5.6 Limitations

5.6.1 Limits of the Data Gathered

Initially, there were going to be 8 participants but one participant could not make the interview due to personal commitments. Still the data was rich enough even with 7 participants. The data was huge and on occasion some participants had a lot to say about concerns that were unrelated to the study as such another analysis for tourism or economic development might give good grounding for research questions. Some participants were a bit shy at first, assuming the study was instituted by the SAAO and eventually warmed up. Overall everyone was keen to share their thoughts about related and unrelated topics.

5.6.2 Limits of the Methods Used

The method used to collect data was useful as attested by scholars like Seidman who say interviewing is a powerful way that allows researchers to gain insight into important social issues to understand the experiences of the individuals whose lives reflect such issues (Seidman, 1937:14). As a research method interpretive phenomenology analysis was particularly useful in extraction of valuable, intricate and enigmatic information (Smith & Osborn, 2015:41) about aspects of the Observatory. While all the data collected answered the question of perception of the relationship, the limitations are that phenomenological research does not respond to why a certain phenomenon happens. Noting the limitations of the method, IPA scholars accept that the approach relies on meaning-making based on context, circumstance of accounts, dialogue and metaphors to obtain perception into the lived experiences of others and through language this is possible (Tuffour, 2017:4)

5.6.3 Limits of the Theoretical Frameworks Adopted

The literature suggests that no study has been done so far about the relational communication between local communities and South African Observatories. While there are emerging issues in Mauna Kea in Hawaii, as yet there are only a few articles out there with only one containing recommendations directing the American Astronomical Society partners to consider developing courses and workshops on Hawaiian and indigenous history as well as knowledge systems for both Hawai'i-based astronomers, Hawaiian kūpuna and educators (Kahanamoku, et al., 2020:9) to close the gap between science and society.

The South African context is guided by the Department of Science and Innovation science engagement strategy implementation plans which are to:

- persuade learners and youth to partake in science;
- capacitate citizens to have independent, literate opinions on science matters;
- placing science communication as an compelling catalyst of science engagement;
- Finding opportunities for citizens to recognise the merit of science (Department of Science and Innovation, 2015:3).

As seen in the results and findings what is apparent in Sutherland is the outreach and science engagement role played by the Observatory at school level. While the effort

addresses implementation plan one of the science engagement strategy. It fails at addressing the last three. During the launch of the Southern African Large Telescope, President Thabo Mbeki talked about “the further liberation of humanity from blind action informed by superstition” (Polity, 2005:2). This excerpt is supported by Manzini, who postulates that communication plays a pivotal role in information circulation from scientists to the ordinary people (Manzini, 2003:192). If science according to Bensaude-Vincent is not merely a presentation of facts rather it is an ontological activity that reproduces shared normative values that model society (2009:361). One only has to look at how South Africa stitched together science and politics from colonial times till the end of apartheid (Dubow 2006 in du Plessis 2017:7).

To advance the participatory method in dialogue, Manzini persuades science communicators to realise that the triumph of communication lies in successfully negotiating and closing the gap between the science culture and social culture thus acknowledging that science wields no power over culture, instead, it navigates the difference with care and consideration of community knowledge. (Manzini, 2003:192). This will allow citizens to become evaluators of technology and coproducers of knowledge, therefore redefining the science communication practice from doing it for science to doing it for democracy (Bensaude-Vincent, 2009:363). This way the diffusion model of dumping knowledge would be discarded and replaced with the participatory approach that no longer views the public as mere passive audiences rather as inspirational individuals participating as responsible members of civil society (Bensaude-Vincent, 2009:362-363).

Communications practitioners and Observatories would benefit from studying their specific environments through boundary spanning to navigate the relational strategies needed to build good participatory community engagement. Considering Manzini's opinion that persuasive communication of science has become a socio-economic essence for developing countries, as such studies show that scientifically literate societies could be extremely innovative and critical users of science and technology services (Manzini, 2003:192). It is crucial for scientific organisations to do away with the diffusion model and to identify that the procedure of presenting scientific results and the method of sharing them are incomprehensible, thus thinking of sharing scientific facts as a communicative action does not imply science is completely understood.

While there is much needed talk around dialogue and engagement with stakeholders as well as two-way symmetrical communication by Grunig and Grunig (1992), in practice there is no evidence of co-creation of meaning that benefits stakeholders or even a dialogue communication practice that does not assume power. Even the corporate communication strategy that assumes a supreme role of mapping stakeholders thereafter crafts communication plans around emergent issues, shows no evidence of actually having an active feedback loop which Steyn and de Beer (2011:11) talk about. On occasion, organisations give in to their stakeholders during tumultuous relations or afterwards as a reaction to being strong-armed as a tool to manage issues for reputation management. The assumption or position that organisations used to exist within small communities where even the executives of the organisations lived thus their strategies considered both the organisation and the community needs makes for a good foundational building block i.e. communication should not be a tool to wield against stakeholders rather it should be a tool used for the benefit of both parties.

Co-creation of relationships should be in the interest of both parties with integrity and ethical behaviour as a core strength. Essentially the approach could take this format of communication: One across meaning the dialogue should extend without an attempt to command or be authoritative or even passive (Courtright, 2015:5). Mutuality as an ideal can only be achieved when everyone contributes towards a goal with the hope attaining equal rewards through cooperation (Phillips, 2010:86). Mutuality means collective gain on the basis of equal participation. It is not the messages that are sent out by the organisation that cultivate relationships with stakeholders, it is the conduct of the organisation (de Beer & Rensburg, 2011:214)

Highlighting gaps in public relations on the nature of relationships, if according to Ledingham, (2006:413) public relations is a management function that provides a framework for managing programs and campaigns within the four-step method of analysis, planning, implementation and evaluation, then what is apparent in the literature is some corporate communication strategies have all these campaign principles yet they are measured from one perspective which is what the organisation sets out to achieve. This then diminishes what is supposed to be the perception of PR as a management function. Furthermore, if the role of PR is to help organisations to

be socially and ethically conscious as well as sustainable, then communication campaigns should be measured both ways – internally and externally, thus realising mutuality. Assuming the two-way communication is a theory in practice, co-creation of what should be done has to reflect that. Otherwise, communication will only be two-way at the level of boundary spanning and collection of concerns from stakeholders in order to customise communication without making corresponding behavioural changes (Roper, 2005:69).

Meaning stakeholders should not only be acknowledged or considered during the mapping, identification and determination of expectations, rather communications should be open from conception right till the end if indeed organisations are to be ethically and socially acceptable. Thus far there is no evidence of the feedback loop between society and organisations or Observatories for that matter, through the two-way symmetrical communication approach (Steyn & Beer, 2011:11). Such conversations become relevant when there have been issues or a threat to the organisation. As is stipulated by participants in Sutherland there is a need for a steering committee or a similar way of engaging with the Observatory. To advance this position, sometimes organisations may arrange internally directed issues management as a symbolic gesture in a closed system that only works to legitimise decisions by the dominant coalition placing the organisation as accessible while stakeholders are given no obvious linkage (Lauzen & Dozier, 1994:168-169).

5.7 Conclusion

The public relations field makes a point of positioning itself as a management function that helps organisations to find a place within society and the location within their operations. This assertion is made with the assumption that everyone within an organisation will recognise the need for the function of public relations and the role played by public relations in nurturing harmonious relationships with the organisations stakeholders.

The idea is also supported by the belief that a corporate communication strategy as a management function that lays out a framework for successful synchrony of combined internal and external communication with an overarching principle of instituting and maintaining favourable reputation with all stakeholder groups with whom the organisation is reliant (Cornelissen, 2020:5) is all there is to it. Yet in practice this might

not be as easy, as evident in the previous chapter outlining results from Sutherland interviews.

Appendices

Consent Forms from the South African Astronomical Observatory



SAAO

South African
Astronomical Observatory

PO Box 9
Observatory 7935
South Africa
Tel: 021 447 0025
Fax: 021 447 3639
Int. Code: +27
enquiries@sao.ac.za

www.sao.ac.za

To Whom It May Concern:

21 March 2019

I, Petri Vaisanen, in my capacity as Managing Director at the South African Astronomical Observatory give consent in principle to allow **Thembele Mantungwa**, a student at the Cape Peninsula University of Technology, to collect data in this company as part of her M Tech Public Relations Management research.

The student has explained to me the nature of his/her research and the nature of the data to be collected.

This consent in no way commits any individual staff member to participate in the research, and it is expected that the student will get explicit consent from any participants. I reserve the right to withdraw this permission at some future time.

In addition, the company's name may or may not be used as indicated below.

(Tick as appropriate.)

	Thesis	Conference paper	Journal article	Research poster
Yes	X	X	X	X
No				

Sincerely

Prof. Petri Vaisanen
Director, South African Astronomical Observatory

9.4.2019

Date

Consent Forms from Participants



FACULTY OF INFORMATICS AND DESIGN

Individual Consent for Research Participation

Title of the study: Relationship-building between communities and astronomical observatories in South Africa

Name of researcher: Thembela Mantungwa
Contact details: email: tmantung@gmail.com phone: 071 1050 109

Name of supervisor: Prof. LJ (Nic) Theo
Contact details: email: theo@cput.ac.za phone: 021 460 3196

Purpose of the Study: The aim of this study is to explore perceptions of the Sutherland community about the Observatory with a view of understanding the extent to which the Observatory engages with its major external stakeholder - the community located 15 kilometres away from the hub of scientific research. Using the lens of strategic role public relations as the aid for organisations to adjust to their societal and stakeholder environment. The objectives of the study are:

- To investigate community perceptions about the astronomical observatory (SAAO)
- To explore the nature of stakeholder engagement/communication that currently exists between the astronomical observatory and the Sutherland community
- To understand if a collaborative relationship could be established between the astronomical observatory and the community around it.

Participation: My participation will consist essentially of

Confidentiality: I have received assurance from the researcher that the information I will share will remain strictly confidential unless noted below. I understand that the contents will be used

only for MTech thesis, journal article and academic purposes and that my confidentiality will be protected by Thembela Mantungwa by using pseudonyms.

Anonymity will be protected in the following manner (unless noted below) pseudonyms will be used for all participants and recorded interviews will only be shared with Cape Peninsula University of Technology. *(Describe how anonymity will be guaranteed, e.g. if photos are being used, the blanking out of faces and/or places names. If anonymity cannot be protected, state this expressly, explain the reason why and explain the risks involved for the participant, the organization, etc).*

Conservation of data: The data collected will be kept in a secure manner digitally recorded interviews will be encrypted and kept in a password controlled environment. Though original data or a copy of the data should be kept for audit purposes by Cape Peninsula University of Technology.

Voluntary Participation: I am under no obligation to participate and if I choose to participate, I can withdraw from the study at any time and/or refuse to answer any questions, without suffering any negative consequences. If I choose to withdraw, all data gathered until the time of withdrawal will be destroyed. <<Change 'destroyed' to something else if negotiated with the participant. Get the participant to initial the change if done by hand.>>

Additional consent: I make the following stipulations (please tick as appropriate):

	In thesis	In research publications	Both	Neither
My image may be used:				
My name may be used:			✓	
My exact words may be used:	✓	✓	✓	
Any other (stipulate):				

Acceptance: I, (print name) CHRISTIAAN MOTHA

agree to participate in the above research study conducted by Thembela Mantungwa of the Faculty of Informatics and Design, Public Relations Department at the Cape Peninsula University of Technology, which research is under the supervision of Prof. LJ(Nic) Theo.



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University of Technology

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Name of supervisor: Prof. LJ (Nic) Theo
Contact details: email: theolj@cput.ac.za phone: 021 460 3196

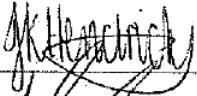
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Confidentiality: I have received assurance from the researcher that the information I will share will remain strictly confidential unless noted below. I understand that the contents will be used

If I have any questions about the study, I may contact the researcher or the supervisor. If I have any questions regarding the ethical conduct of this study, I may contact the secretary of the Faculty Research Ethics Committee at 021 469 1012, or email naidoo@cput.ac.za.

Participant's signature:  _____

Date: 31/03/21

Researcher's signature:  _____

Date: 31 March 20



only for MTech thesis, journal article and academic purposes and that my confidentiality will be protected by Thembele Mantungwa by using pseudonyms.

Anonymity will be protected in the following manner (unless noted below) pseudonyms will be used for all participants and recorded interviews will only be shared with Cape Peninsula University of Technology. *(Describe how anonymity will be guaranteed, e.g. if photos are being used, the blanking out of faces and/or places names. If anonymity cannot be protected, state this expressly, explain the reason why and explain the risks involved for the participant, the organization, etc).*

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Additional consent: I make the following stipulations (please tick as appropriate):

	In thesis	In research publications	Both	Neither
My image may be used:				
My name may be used:				
My exact words may be used:			✓	
Any other (stipulate):			✓	

Acceptance: I, (print name) JOHANNRI - KAYE

agree to participate in the above research study conducted by Thembele Mantungwa of the Faculty of Informatics and Design, Public Relations Department at the Cape Peninsula University of Technology, which research is under the supervision of Prof. LJ(Nic) Theo.

(Handwritten signature)

FACULTY OF INFORMATICS AND DESIGN

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Contact details: email: tmantung@gmail.com phone: 071 1050 109

Name of supervisor: Prof. LJ (Nic) Theo
Contact details: email: theolj@cput.ac.za phone: 021 460 3196

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Participant's signature: 

Date: 10/03/2021

Researcher's signature: 

Date: 10 March 2021



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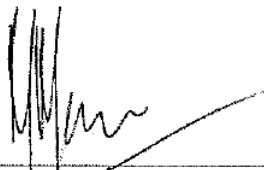
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Confidentiality: I have received assurance from the researcher that the information I will share will remain strictly confidential unless noted below. I understand that the contents will be used

Participant's signature:



Date:

14.3.2020

Researcher's signature:



Date:

14 March 2020



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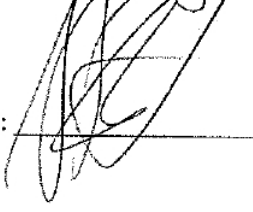
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Participant's signature: 

Date: 31. 03. 2021

Researcher's signature: 

Date: 31 March 2021

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My name may be used:			✓	
My exact words may be used:		✓	✓	
Any other (stipulate):			✓	

Acceptance: I, (print name) Venischero Charlene Wentzel

agree to participate in the above research study conducted by Thembela Mantungwa of the Faculty of Informatics and Design, Public Relations Department at the Cape Peninsula University of Technology, which research is under the supervision of Prof. LJ(Nic) Theo.



Cape Peninsula
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FACULTY OF INFORMATICS AND DESIGN

Individual Consent for Research Participation

Title of the study: Relationship-building between communities and astronomical observatories in South Africa

Name of researcher: Thembela Mantungwa
Contact details: email: tmantung@gmail.com phone: 071 1050 109

Name of supervisor: Prof. LJ (Nic) Theo
Contact details: email: theolj@cput.ac.za phone: 021 460 3196

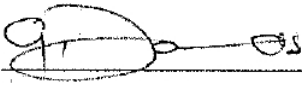
Purpose of the Study: The aim of this study is to explore perceptions of the Sutherland community about the Observatory with a view of understanding the extent to which the Observatory engages with its major external stakeholder - the community located 15 kilometres away from the hub of scientific research. Using the lens of strategic role public relations as the aid for organisations to adjust to their societal and stakeholder environment. The objectives of the study are:

- To investigate community perceptions about the astronomical observatory (SAAO)
- To explore the nature of stakeholder engagement/communication that currently exists between the astronomical observatory and the Sutherland community
- To understand if a collaborative relationship could be established between the astronomical observatory and the community around it.

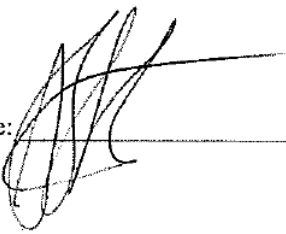
Participation: My participation will consist essentially of

Confidentiality: I have received assurance from the researcher that the information I will share will remain strictly confidential unless noted below. I understand that the contents will be used

If I have any questions about the study, I may contact the researcher or the supervisor. If I have any questions regarding the ethical conduct of this study, I may contact the secretary of the Faculty Research Ethics Committee at 021 469 1012, or email naidoove@cput.ac.za.

Participant's signature: 

Date: 31/03/2021

Researcher's signature: 

Date: 31 March 20



Cape Peninsula
University of Technology

FID/REC/ICv0.1

FACULTY OF INFORMATICS AND DESIGN

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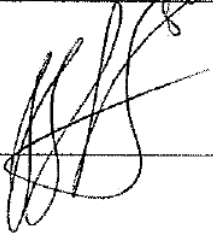
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Participant's signature: 

Date: 30 MARCH 2021

Researcher's signature: 

Date: 30 March 2021

only for MTech thesis, journal article and academic purposes and that my confidentiality will be protected by Thembela Mantungwa by using pseudonyms.

Anonymity will be protected in the following manner (unless noted below) pseudonyms will be used for all participants and recorded interviews will only be shared with Cape Peninsula University of Technology. *(Describe how anonymity will be guaranteed, e.g. if photos are being used, the blanking out of faces and/or places names. If anonymity cannot be protected, state this expressly, explain the reason why and explain the risks involved for the participant, the organization, etc).*

Conservation of data: The data collected will be kept in a secure manner digitally recorded interviews will be encrypted and kept in a password controlled environment. Though original data or a copy of the data should be kept for audit purposes by Cape Peninsula University of Technology.

Voluntary Participation: I am under no obligation to participate and if I choose to participate, I can withdraw from the study at any time and/or refuse to answer any questions, without suffering any negative consequences. If I choose to withdraw, all data gathered until the time of withdrawal will destroyed. <<Change 'destroyed' to something else if negotiated with the participant. Get the participant to initial the change if done by hand.>>

Additional consent: I make the following stipulations (please tick as appropriate):

	In thesis	In research publications	Both	Neither
My image may be used:				
My name may be used:			✓	
My exact words may be used:			✓	
Any other (stipulate):			✓	

Acceptance: I, (print name) ALUCIAANE C. M WENTZEL

agree to participate in the above research study conducted by Thembela Mantungwa of the Faculty of Informatics and Design, Public Relations Department at the Cape Peninsula University of Technology, which research is under the supervision of Prof. LJ(Nic) Theo.

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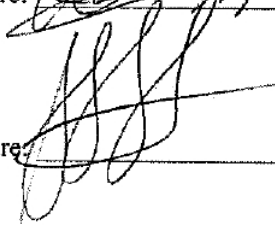
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Date:

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