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ABSTRACT

The purpose of this study was to understand the importance of niche market-based tourism routes in a sustainable rural development context. This study proposes a framework for tourism route development with Astro Tourism as the focal niche. Sustainable tourism routes occur when strong linkages are established between attractions, products and services in rural areas. Having an integrated approach between local, provincial and national stakeholders, from both the private and public sector will create job opportunities and by so doing, alleviate poverty. Towns in the Karoo rural node of the Northern Cape Province in the Republic of South Africa were selected as a case study for the research, where Astro Tourism, as an emerging niche market, is gaining momentum due to the establishment of two world-class astronomy projects, namely the South African Large Telescope (SALT) in Sutherland and the Square Kilometre Array (SKA) in Carnarvon.

Mixed methods were employed to investigate the sustainability of tourism product development through exploring the experience and perceptions of the various role-players. These included the tourists, local communities, tourism businesses and private stakeholders in the astronomy and tourism disciplines, as well as government representatives. The researcher obtained a holistic view of the different role-players by including a variety of research instruments. Focus group sessions were held with local community members in the towns selected; in-depth interviews were conducted with government representatives; semi-structured questionnaires were distributed to relevant stakeholders and structured questionnaires were distributed to tourism businesses and tourists. This amalgamation of research instruments ensured a dataset of high quality. The analysis of the consolidated data from the different role-players provided unique information for sustainable destination development from both the demand-side and supply-side perspectives. Unique access allowed the researcher to engage directly with stakeholders through various platforms, all adding invaluable data to the research. This study contributes to the existing literature on sustainable rural development and niche market-based tourism routes. The literature review also deliberates on Astro Tourism and

space tourism as distinctive contributors to tourism product development. As an outcome, the study presents a framework depicting Astro Tourism framed within a tourism route as mechanism to develop rural areas in developing countries.

KEYWORDS: sustainability, rural development, tourism routes, Astro Tourism, Karoo, SKA, SALT

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GLOSSARY

- **Astronomy:** the science that studies the “... position, movement, structure, origin and development of the celestial bodies and the system of which it formed” (Belij & Tadic, 2015:60).
- **Astro Tourism:** a niche that is a form of eco-tourism (Najafabadi, 2012:130). Astro Tourism offers an in-depth view into the cosmos, such as rainbows, sunsets and sunrises, solar and lunar eclipses (Ingle 2010a:98).
- **Communities:** defined as “... people from a certain geographical location, nature of their interactions and community characteristics (Muganda, Sirima & Ezra, 2013:54) and “... a small spatial unit, homogenous social structure with shared norms and common interests”, as well as “... groups of people with a common identity and who may be involved in an array of related aspects of livelihoods. Local communities often have customary rights related to the area and its natural resources and a strong relationship with the area culturally, socially, economically and spiritually.” (Scherl & Edwards, 2007 cited in Muganda *et al.*, 2013:54).
- **Development:** is a concept of “... expanding the richness of human life, rather than simply the richness of the economy in which human beings live. It is an approach that is focused on people and their opportunities and choices” (United Nations Development Programme, 2015 cited in United Nations World Tourism Organisation, 2015).
- **Good Governance:** defined as “... the interactions among structures, process and traditions that determine how power and responsibilities are exercised, how decisions are taken, and how other stakeholders have their say” (Haukeland, 2011:139).

- **Local Economic Development:** defined as “... a process whereby sector partners work together to increase economic growth and the level of employment in a specific geographic region” (Snowball & Courtney, 2010:566).
- **Partnerships:** “Regular, cross-sectoral interactions over an extended period of time between parties, based on at least some agreed rules or norms, intended to address common issues or to achieve a specific policy goal or goals, which cannot be solved by the partners individually and involving pooling and sharing of appreciations or resources, mutual influence, accountability, commitment, participation, trust and respect and transparency” (Liang, Wegner, Moore, Weiler & Pfueller, 2008:5; Wilson, Nielsen & Buultjens, 2009:271).
- **Pro-poor Tourism:** is defined by the Overseas Development Institute (ODI) as the tourism that “... generates increased net benefits for poor people” (Ashley & Roe, 2002:62; Mitchell & Faal, 2007:446; Mograbi & Rogerson, 2007:86; Rogerson, 2006:43; Torres & Momsen, 2006:296). It is a relatively new concept and “... enhances the linkages between tourism businesses and poor people” (Viljoen, Viljoen & Struwig, 2010:66).
- **Rural Areas:** defined as “... sparsely populated areas in which people farm or depend on natural resources, including villages and small towns that are dispersed throughout these areas. In addition, they include large settlements in the former homelands, created by apartheid removals, which depend for their survival on migratory labour and remittances. An estimate of “... 10-15 million South Africans live in rural areas that are characterised by extreme poverty and severe underdevelopment” (Comprehensive Rural Development Programme, 2009:8).
- **Rural Development:** involves community beneficiation through activities and attractions based on collaboration and partnerships between communities and the private and public sectors. The Pro-poor element is usually included in rural tourism development and is often developed to generate employment, growth community infrastructure and invigorate economies in the rural areas (Meyer, 2004:3).

- **Rural Tourism:** the definition given to travel to rural spaces. Rural tourism is defined as a specific tourism product, requiring the presence of agriculture as a core element (Eusébio, Kastenholz & Breda, 2014). Rural tourism expands beyond farm-based tourism and includes niche activities, such as nature holidays and eco-tourism, walking, climbing and riding holidays, adventure, sport and health tourism, hunting and angling, educational travel, arts and heritage tourism, and in some areas, ethnic tourism (Eusébio, *et al.*, 2014; Okech, Haghiri & George, 2012; Viljoen & Tlabela, 2006).
- **Stakeholders:** “Any group of people, organised or unorganised, who share a common interest or stake in a particular issue or system: they can be at any level or position in society, from global, national and regional concerns down to the level of household or intra household, and be groups of any size or aggregation” (Lyon, Hunter-Jones & Warnaby, 2017:235).
- **Sustainable Development:** defined according to the Brundtland Report in 1987, as “... development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Laitamaki, Hechavarría, Tada, Liu, Setyady, Vatcharasontorn & Feizhou, 2016:8).
- **Sustainable Tourism Development:** defined as “... a sub-set of sustainable development. It considers the needs of the visitors and manages all resources such as the tourism industry, the environment and local communities in such a way that economic, social and aesthetic needs can be filled while maintaining cultural integrity, essential ecological processes, biological diversity and life supporting systems” (Muganda *et al.*, 2013:54; Sharpley, 2010; Tourism Route Development Framework, 2016; United Nations World Tourism Organisation, 2015; UNWTO, 2017).
- **Tourism Destination:** “... a travel destination that attracts a lot of visitors, like a historical site or natural wonder” (Tourism Route Development Framework, 2016).

- **Tourism Route:** defined as “the inventiveness to bring together a diversity of activities and attractions under combined branding and joint marketing efforts that result in stimulating entrepreneurial opportunity through the development of auxiliary products and services” (Lourens, 2007).

LIST OF ABBREVIATIONS

ABBREVIATION	MEANING
AGAA	Astronomy Geographic Advantage Act
B&B	Bed and Breakfast
CAQDAS	Computer aided qualitative data analysis software
CBT	Community-based tourism
CIPC	Companies and Intellectual Property Commission
CMP	Corridor Management Plans
CRDP	Comprehensive Rural Development Programme
CSIR	Council for Scientific and Industrial Research
DEAT	Department of Environmental Affairs and Tourism
DEDAT	Department of Economic Development and Tourism
DMOs	Destination Marketing Organisations
DMR	Department of Main Roads
DST	Department of Science and Technology
DTI	Department of Trade and Industry
DTP	Drive Tourism Project
EPWP	Expanded Public Works Programme
FDI	Foreign Direct Investment
HartRAO	Hartebeeshoek Radio Observatory
HDIs	Historically Disadvantaged Individuals
HESS	High Energy Stereoscopic System
HET	Hobby-Eberly Telescope
HTI	Hospitality Technology International
IAU	International Astronomical Union
ICOMOS	International Council on Monuments and Sites
IDSA	International Dark Sky Association
IDC	Industrial Development Corporation
IDP	Integrated Development Plan
IPA	Importance-Performance Analysis
ISS	International Space Station
LED	Local Economic Development
MDG	Millennium Development Goals

MMA	Midlands Meander Association
MoU	Memorandum of Understanding
NASA	National Aeronautics and Space Administration
NCT	National Centre for Tourism
NDP	National Development Plan
NDT	National Department of Tourism
NEF	National Empowerment Fund
NC DEDAT	Northern Cape Department of Economic Development and Tourism
NCTA	Northern Cape Tourism Authority
NGP	National Growth Path
NRDS	National Research and Development Strategy
NRF	National Research Foundation
NSI	National System of Innovation
NTSS	National Tourism Sector Strategy
MeerKAT	Karoo Array Telescope
MoU	Memorandum of Understanding
OECD	Organization for Economic Cooperation and Development
ODI	Overseas Development Institute
OHSRC	Office of the Human Science Research Council
OUV	Outstanding Universal Value
PESTEL	Political, Economic, Socio-cultural, Technological, Environmental and Legal scenarios
PFMA	Public Finance Management Act
PGDP	Provincial Growth and Development Strategies
PICC	Presidential Infrastructure Coordinating Commission
PPT	Pro-Poor Tourism
PPTP	Pro-Poor Tourism Partnership
PPP	Private Public Partnership
QHTN	Queensland Heritage Trails Network
QR	Quadratic Residue
RDP	Reconstruction and Development Programme
RFSA	Russian Federal Space Agency
RFI	Radio Frequency Interference
SAAO	South African Astronomical Observatory
SAASTA	Science and Technology Advancement

SANRAL	South African National Roads Agency
SALT	South African Large Telescope
SAT	South African Tourism
SATSA	South African Tourism Services Association
SDF	Spatial Development Framework
SDG	Sustainable Development Goals
SDPs	Spatial Development Plans
SEDA	Small Enterprise Development Agency
SEF	Science Engagement Framework
SEFA	Small Enterprise Finance Agency
SERNATUR	<i>Servicio Nacional de Turism</i> (Chile's National Tourism Service)
SIPDM	Standard for Infrastructure Procurement and Delivery Management
SIPs	Strategic Integrated Projects
SKA	Square Kilometre Array
SMMEs	Small, Medium and Micro Enterprises
SOAR	Strengths, Opportunities, Aspirations and Results
SPSS	Statistical Package for Social Science
ST- EP	Sustainable Tourism – Eliminating Poverty
SWOT	Strengths, Weaknesses, Opportunities and Threats
TQ	Tourism Queensland
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNWTO	United Nations World Tourism Organisations
WHC	World Heritage Centre
VICs	Visitor Information Centres

CHAPTER 1: INTRODUCTION

1.1 BACKGROUND TO THE STUDY

Approximately 70% of the world's poorest populations live in rural areas, particularly in developing countries (Okech *et al.*, 2012; Ursache, 2015). Geographically, these rural areas are economically disadvantaged areas, which are located on the distant periphery of urban and more developed metropolises. These peripheral areas have sparsely scattered populations, characterised by communities that are challenged with inadequate bulk infrastructure, marginal economic activities, low education levels and very high unemployment rates. For rural areas to be established in a sustainable manner, the main attractions together with other tourism activities as well as agricultural activities need to co-exist with one another. The co-existence of these component parts depends on the effective collaboration and an established relationship between the respective management authorities so that their combined growth guarantees the economic growth of rural areas (Ashley & Roe, 2002). The co-existence and collaboration of a variety of tourism products and offerings in distant rural areas are best demonstrated through the development of a tourism route.

The objective of a tourism route is to bring together a number of activities and attractions to enhance tourist satisfaction and consumption under a combined brand and joint marketing (Lourens, 2007). Tourism routes are, moreover, a partnership of the "... historical, economic and cultural elements between cities, smaller towns and tourist historic cities and regions" (Meyer, 2004:7). The development of tourism routes is realised by both the private and public sectors to improve the attractiveness of the area (Meyer, 2004). The tourism destination is, therefore, characterised by an interaction between the supply of unique tourism products as well as the demands of tourists (Marques & Santos, 2014). A tourism route is an effective, unique and flexible tourism product offering for rural towns that enables tourists to plan and design their own vacation itinerary. Planned travel routes can be developed through a self-drive tour mode, where tourists use their own vehicles. As a result of the flexible nature of tourism routes, tourists are free to choose

their own itinerary based on their specific interests, requirements and time and cost factors (Hashim, Ismail & Ahmad, 2013:1420). Infrastructural development at identified areas along the route and the increased demand for modern technology by tourist and commercial enterprises as well as business relationships are all improved by the establishment of new tourist routes (Kovács & Nagy, 2013). In this regard, Ray Deftereos, CEO of Hospitality Technology International (HTI), stated that science projects, like the SKA, have a great potential to influence technology in the tourism and hospitality industry in respect of the advancement of reservation systems and strengthening customer engagements with the industry (Hatchuel, 2013). The success of rural tourism development depends on the commercial, economic and logistical strengths of local municipalities in respect of the quality and availability of products and goods, accessibility, infrastructure, the skills available in local communities and the interest of investors (Okech *et al.*, 2012).

Rural areas are most conducive towards the hosting of science and astronomy project initiatives as these areas have atmospheric transparency, low levels of light pollution, low population density and minimal radio frequency interference (Astronomy Geographic Advantage Act No, 21 of 2007:14). Such initiatives include the development of the country's knowledge base by establishing scientific and astronomy facilities in these areas. Tourism routes provide an enabling environment for such facilities to be easily accessible and equipped for tourism consumption. Along with the rationale to develop rural areas, the South African government has been investing in the development of socio-economic aspects that would be beneficial for the local communities in these areas. The public's general interest in astronomy is slowly but steadily rising, and through this study, the tangible socio-economic benefits that could be provided by the tourist industry are investigated in collaboration with tourism routes and scientific facilities (SKA South Africa, online).

1.2 PROBLEM STATEMENT

The tourism sector in South Africa has suffered from the consequences of Apartheid policies during which the pre-1994 regime only catered for the white elite's leisure time

interests and activities (Visser & Rogerson, 2004:204). This was a situation in which the majority ownership of tourism products remained in the hands of white individuals, companies and associations. Tourism, under the past regime, restricted the majority of the black population from enjoying certain tourism facilities, thereby creating an uneven and anti-development appeal towards the tourism industry (Hill *et al.*, 2006; Rogerson, 2014; Visser & Rogerson, 2004). As result, the South African government was faced with unequal destination development, especially in rural areas (Briedenhann & Wickens, 2004; Viljoen & Tlabela, 2006). Disputes over legal tenure of land, economic survival and a disregard for local cultural identity tended to be stumbling blocks for development in rural areas. Rural development was prioritised by the new post-1994 democratic government as tourism began to address the aftermath of the Apartheid era (Viljoen & Tlabela, 2006). As a means of attracting local investment and increased local economic development (LED), the tourism sector is redressing its negative reputation and aspiring to reverse an imbalanced society by creating a favourable environment for inclusive growth (Butler & Rogerson, 2016; Kovács & Nagy, 2013). According to the Organization for Economic Cooperation and Development (OECD), inclusive growth is “... a new approach to economic growth that aims to improve living standards and share the benefits of increased prosperity more evenly” (OECD, 2015:16).

Through rural development, tourism and the associated industries support societal transformation through the diversification of ownership of tourism products and services in the country. Tourism provides the opportunity for rural areas to become increasingly productive in relation to viable agriculture and development programmes. Productivity in these areas becomes evident through the utilisation of natural resources, thereby contributing to local farm income and the enhancement of visitors’ experiences (Nowers, De Villiers & Myburgh, 2002). Furthermore, tourism in peripheral areas assists in addressing the economic and social problems of local communities through job creation and an improved standard of living, especially in developing areas such as Southern Africa (Kovács & Nagy, 2013; Saarinen, 2010). Rural tourism redesigns rural economic space, by growing both agricultural and non-agricultural opportunities (Marques & Santos, 2014).

A lack of knowledge of the related markets and minimal information exchange between the stakeholders and local communities result in low investment and unsatisfactory involvement of the local communities in destination and route planning. Trejos and Chiang (2009) indicate that some scholars exaggerate about what tourism might achieve and that such claims are unrealistic, while Saarinen (2007) cautions against harnessing the unrealistic expectations that tourism might bring to rural communities. Unrealistic claims are, at times, related to over-achieving economic projections for tourism earnings. This, therefore, calls for an accurate investigation about the true impact of tourism development on rural communities. Rural tourism development faces a number of ongoing challenges. Lourens (2007) and Stevens (2007) agree that the impacts of rural tourism development and marketing experiences are commonly not well recorded and documented. Tourism development initiatives are, at times, unsustainable due to a lack of collaboration and combining the correct resources to bring multi-level benefits. Thus, it is important that the correct resources are properly allocated, channelled, managed and closely monitored. Sustainable tourism development requires a multi-stakeholder management approach, which includes the local communities, in order to strengthen the planning and implementation processes (Chin *et al.*, 2016; Eusébio *et al.*, 2014).

In the past, very little attention has been given to the economic growth of rural communities and tourism development has occurred at the expense of small, family-run businesses (Akyeampong, 2011). As tourism is perceived as a costly industry, a large amount of public funds is spent on tourism attractions and facilities. The public feels that these costs could rather have been spent on basic public services such as health, education and sanitation for rural communities (Akyeampong, 2011). Tourism initiatives have also caused displacement, inequality and social disruptions amongst rural communities (Ashley & Roe, 2002). Threats to tourism investors are mainly found in unacceptable levels of safety and security and the fear of political instability (Visser & Rogerson, 2004). Rural areas are challenged by a lack of coordination and integration due to uneven spatial structures and a lack of resources or where resources are frequently under-utilised (Visser & Rogerson, 2004). Local communities find that their concerns are overlooked and that they are placed in an inferior position in relation to other stakeholders. Their participation in tourism products is strongly influenced by negative

emotions related to their inferior status and associated low level of confidence and hope. This situation is mainly due to a lack of information, formal education and business operation experience as well as the fact that they are in dire need of financial support and an in-depth knowledge about the tourism industry (Jigang & Jiuxia, 2007; Sampaio *et al.*, 2012). This coincides with a statement by Saarinen (2006:1133), that "... local communities do not have automatic privileges over the ethical or sustainable aspects of tourism, nor do they necessarily have any intrinsic knowledge of the impacts and the scale of these impacts on the environment."

It is thus important that local municipalities capitalise and communicate about the socio-economic advantages associated with rural tourism. By so doing, they will reduce the negative impacts that development may have on the local community, their culture and the environment. Tourism development should concentrate on the enhancement of the tourism product while improving the livelihoods of rural communities with agriculture as a key driver (Bitsani & Kavoura, 2014; Chin, Lo & Ramayah, 2016). In order to reconcile the estrangement between the tourism industry and local communities, attention needs to be given to detailed and sensitive destination planning and development. Moscardo (2014) recommends that the local community should nominate representatives as tourism leaders and that the growth of entrepreneurs be encouraged. By so doing, this would be advantageous to the growth of human capital at the destination. The challenge, however, is that government, both local and provincial, is unable to communicate effective policies and guidance to the communities concerned. Tourism development relies on strategic planning and public policy. Such policies should not be disregarded, as they ensure that tourism entrepreneurship grows within clear and constructive cooperative governing structures (Picard, 2015). Policy implementation is characterised by inadequacies due to lack of capacity, and many a time, governing officials have been found guilty of misconduct in relation to funding operations (Visser & Rogerson, 2004).

1.3 PURPOSE STATEMENT

The aim of this study is to investigate tourism route development in a sustainable rural context. This investigation highlights the role of Astro Tourism as a potential catalyst by proposing a development framework that can be implemented globally. Due to the attributes of rural areas, being situated on the periphery of urban and metropole cities, tourism routes to rural areas have grown significantly throughout the world. This is occurring because tourism routes link urban to rural areas and visitors are becoming more curious about the natural environment and want new experiences with greater flexibility and real-life meaning (Meyer, 2004). Tourists are also seeking areas to get away from urban life, rejuvenate and embark on unique activities, such as those provided by Astro Tourism (Eusébio *et al.*, 2014). The end-goal of Astro Tourism in rural areas is to be developed sustainably and as a competitive advantage for the destination. Many astronomical sites have a specific feature which relates to agriculture and traditional practices (Collison, 2011). Sustainable tourism is known to contribute significantly to job creation and reduce the poverty level amongst the local communities (Chin *et al.*, 2016: 180; Gössling, Ring, Dwyer, Andersson & Hall, 2016; Marschall, 2012; Zolfani, Sedagha, Maknoon & Zavadskas, 2015).

In line with sustainable rural development, alternative tourism or niche market-based tourism is characterised by “... small-scale, community-driven, local owned tourism products with low levels of negative impacts and low leakage” (Marschall, 2012:726). Over the past decade, the public sector has expanded tourism infrastructure, invested in marketing tourism products and assisted the private sector to develop new products and services. Astro Tourism can be used as a vital niche market in developing countries with the potential to stimulate other tourism offerings and entrepreneurial opportunities.

Other tourism offerings in rural areas, especially in developing countries, are geo-tourism, transport and railway tourism, research tourism, volunteer tourism, paleo-tourism, botanical tourism, eco-tourism, birding, literary tourism, small town festivals and heritage tourism, to mention but a few (Ingle, 2010b). Astro Tourism is potentially a unique tourism product offering as 50% of the world’s population can no longer see the stars. This is because much of the dark night sky is overcast by light pollution (Ingle, 2012). The African

sky remains one of the most accessible and biggest astronomy laboratories, because the continent has the advantage of being situated under the clearest and darkest night sky (Govender, 2011). The niche market-based tourism sector permits transformation in the sector as well as inclusive empowerment. Astro Tourism includes a strong pro-poor approach by attracting professional, amateur and indigenous astronomers (Marschall, 2012).

Pro-Poor Tourism (PPT) is not an initiative to eliminate absolute poverty, but rather to contribute to the local economy of the area and reduce the vulnerability of local communities (Muresan *et al.*, 2016). Critics of PPT argue that such initiatives do not truly have an impact on conditions experienced by the poor as intended, but Rogerson (2003) emphasises that PPT initiatives link small informal businesses to the formal mainstream tourism industry and impact positively on the daily existence of communities (Viljoen *et al.*, 2010). The leading stimulus for tourism development is the positive interaction between tourism product development and local communities. Moscardo (2014) refers to Flora's (2004) community well-being framework and indicates that the following indicators should result in positive growth in any community. This includes:

- **Cultural Growth:** referring to local arts, crafts and rituals;
- **Social Growth:** emphasising the loyalty built on social networks and cooperative organisations;
- **Human development:** referring to the skills, knowledge and capacity of local communities;
- **Political Growth:** accessibility to government representatives and those who make decisions about the community and town development;
- **Natural Growth:** the natural resources and environment systems; and
- **Physical Growth:** infrastructure that supports community activities.

1.4 RESEARCH OBJECTIVES

The main aim of this research study is to propose a development framework for sustainable tourism route development with Astro Tourism as the focal niche in the context of a developing country. This initiative is supported by the following objectives:

Objective 1: To investigate the factors that contribute to sustainable development in the rural context;

Objective 2: To describe successful tourism routes that are based on niche markets;

Objective 3: To describe astronomy in the context of tourism with specific reference to Space Tourism and Astro Tourism; including a description of the contribution that Astro Tourism makes toward the Karoo as tourism destination in respect of the Square Kilometre Array and the South African Large Telescope;

Objective 4: To determine the demographics and travel characteristics of visitors to rural towns selected in the Karoo, in the Northern Cape Province;

Objective 5: To investigate tourists' overall perceptions and experience of the destination using an Importance-Performance Analysis (IPA); and

Objective 6: To determine stakeholder perceptions of tourism development in respect of Astro Tourism activities in the region of the case study in relation to tourism product development and infrastructure; local economic development and the Pro-Poor Tourism approach; community participation and ownership; stakeholder collaboration and integrated roles and responsibilities.

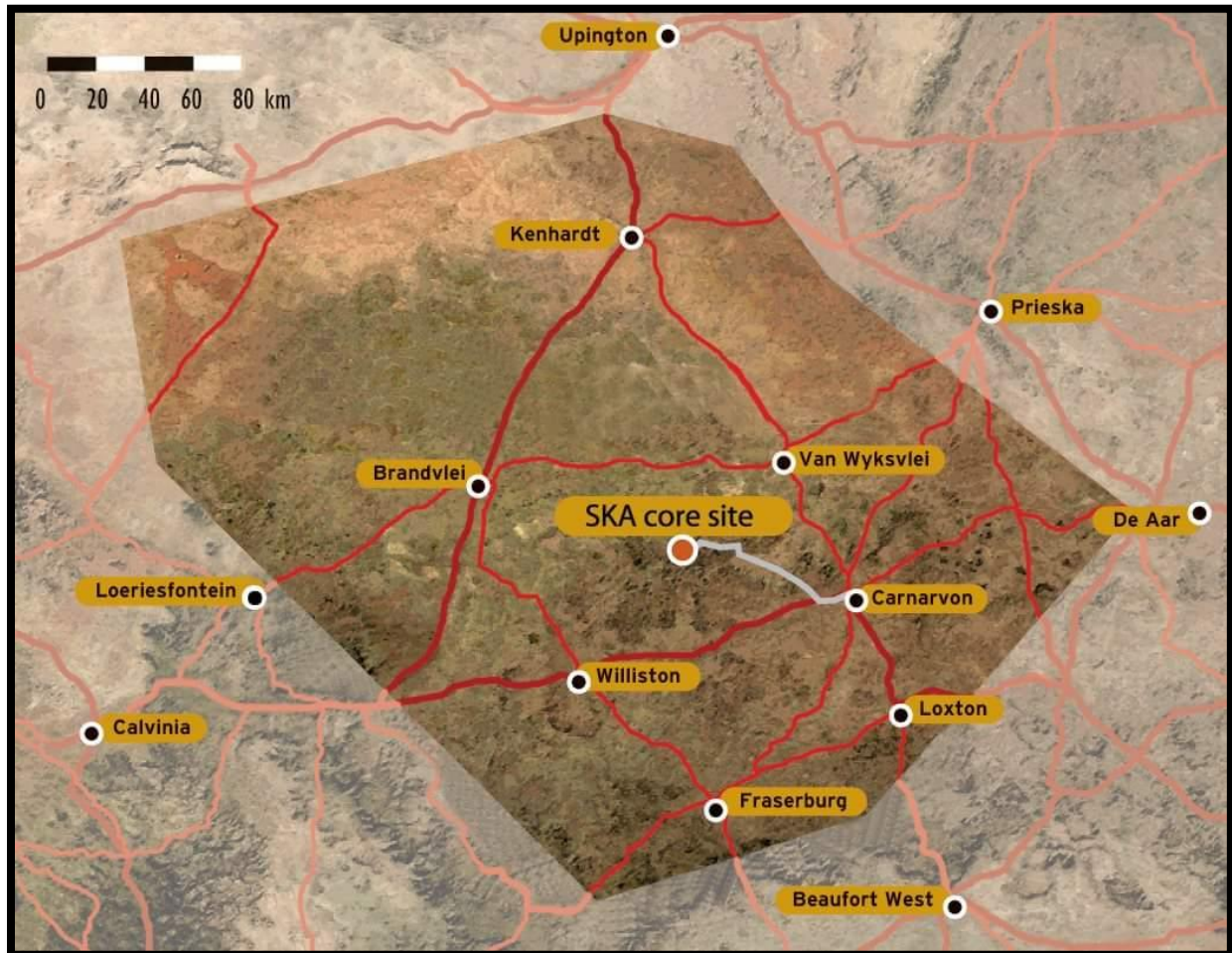
1.5 RESEARCH METHODOLOGY

Research design and methodology is a process that is consistent in nature and creates the linkages between theoretical analysis, empirical data, recommendations and conclusions. For this reason, the research design that was chosen had to effectively address the research problems identified and adhere to the research objectives (Saunders, Lewis & Thornhill, 2012). An interpretive research philosophy was deemed to be the most appropriate method for this study, as it provided the researcher with an in-depth view of the real world situation. The analysis enabled the researcher to draw

information from the various participating role-players in order to create a collective sense of the phenomenon. In this case, destination development related to Astro Tourism in a developing country, focussing on the Karoo rural area in the Northern Cape Province (Maree, 2007). The researcher also adopted a deductive reasoning approach in which conclusions are based on the observations and results of the empirical research analysis. Deductive reasoning is based on the research process transitioning from general to specifics in order to identify themes and patterns. This process allowed the researcher to develop a conceptual framework (Saunders *et al.*, 2012).

A case study research design was applied in the study. This enabled the researcher to capture the project for a specific period of time and steer the research scope. In this situation, the case study was the tourism destination that surrounds the Square Kilometre Array (SKA) and the South African Large Telescope (SALT). The towns that form part of the tourism destination are the Astronomy Geographic Advantage Area within the Karoo rural region of the Northern Cape Province. Sutherland, Fraserburg, Williston, Loxton and Carnarvon were identified and selected as the towns with the potential to form part of the proposed Astro Tourism route.

Figure 1: Selected towns within the Astronomy Geographic Advantaged Area, Northern Cape Province



Source: SKA South Africa (2014)

This study made use of mixed methods, which included both quantitative and qualitative research analyses, to draw together the most comprehensive approach for destination development through a niche market. The quantitative component explored the travel trends and patterns of visitors to the identified rural towns. Data was collected from visitors by means of a survey using self-completion questionnaires. This analysis brought about an understanding of tourist demands by observing the travel patterns, requirements, perceptions and satisfaction levels of visitors to the area. It also provided an indication of the improvements required from a visitor's point of view. The qualitative component provided information concerning various stakeholder perceptions regarding sustainable development, with regards to the region being a potential Astro Tourism destination. This was done through focus groups, semi-structured questionnaires and in-depth interviews

with the respective stakeholder groups. The combination of quantitative and qualitative research findings enabled the researcher to develop a comprehensive framework for Astro Tourism route development within a rural development context.

1.5.1 Sampling

For the purpose of the quantitative research, visiting tourists participated and by doing so addressed **Objective 4**: “To determine the demographics and travel characteristics of visitors to the towns selected in the Karoo in the Northern Cape Province” and **Objective 5**: “To investigate the tourists’ overall perceptions and experience of the destination using an Importance-Performance Analysis (IPA)”. On the other hand, the qualitative research answered to **Objective 6**: “To determine stakeholder perceptions of tourism development in respect of Astro Tourism activities in the region of the case study in relation to tourism product development and infrastructure; local economic development and the Pro-Poor Tourism approach; community participation and ownership; stakeholder collaboration and integrated roles and responsibilities.”

Lyon, Hunter-Jones and Warnaby (2017) mentioned that the predominant stakeholders in tourism are the tourists, the local communities, entrepreneurs and local government or management officials. Further research shows that an inclusive stakeholder analysis should be considered to understand stakeholder behaviour, interests, agendas and influences on decision-making. For this reason, this research study sought to determine stakeholder perceptions of tourism development initiatives in respect of Astro Tourism activities, namely, the perceptions of local communities, tourism businesses and government representatives.

The sample for the quantitative research was gathered from 130 visiting tourists to the respective towns, while the qualitative research involved the participation of 44 local community members and 23 tourism businesses. Of the non-residents in the region, 11 government sector representatives and nine (9) astronomy and tourism stakeholders participated. The researcher also participated in 11 pertinent stakeholder engagements such as workshops, meetings and various forums.

1.5.2 Data Analysis and Results

The researcher used the Statistical Package for Social Sciences (SPSS) to analyse the quantitative data. The printed questionnaires were distributed to various tourism businesses and to the SALT at the South Africa Astronomical Observatory (SAAO) in Sutherland. Web-based questionnaires were placed on relevant social media platforms, namely, Twitter, LinkedIn and Facebook. Qualitative data were gathered through the following research instruments: in-depth interviews, semi-structured questionnaires and focus groups in order to establish the relationships between the social actors, and having a collaborative approach to develop the proposed framework. The qualitative data were analysed through the ATLAS.ti programme to establish themes and draw linkages with the relevant literature.

Descriptive statistics were used to describe the demographics and travel characteristics of visitors. Thereafter, an Importance-Performance Analysis (IPA) was conducted to determine differences between the importance of tourism products and current state of the infrastructure in the respective destinations versus the levels of tourist satisfaction of such tourism offerings and infrastructure. The IPA uses mean ratings for importance and performance scores and creates a two-dimensional grid that identifies the strengths and weaknesses of the area as a tourism destination (Gonçalves *et al.*, 2014). Inferential statistics, namely *t*-tests were also used to determine the differences between the expectations and satisfaction levels of visiting tourists (Saunders *et al.*, 2012).

In terms of the qualitative research, analyses were conducted using the “Strengths, Opportunities, Aspirations and Results (SOAR) approach” (Stavros & Cole, 2013) and the “Political, Economic, Socio-cultural, Technological, Environmental and Legal (PESTEL) scenarios” (Fayos-Solé *et al.*, 2014). These were used to measure the *status quo* of the destination’s development. These analyses aimed to provide an indication of the current state of the region and its readiness for tourism consumption (Chaoprayoon & Panyadee, 2013).

1.6 ACADEMIC CONTRIBUTION OF THE STUDY

The aim of this study was to contribute towards the sustainable tourism research agenda in developing countries. Sustainable tourism in relation to rural areas and tourism routes was explored through a literature review and empirical data analyses. The study confirmed that tourism routes provide opportunities for tourism products and services to come together, to simplify marketing initiatives and to package a diverse number of experiences. Furthermore, this study's emphasis on tourism routes indicates how such routes help overcome the spatial imbalance between urban and rural tourism offerings.

Tourism authors state that niche market tourism promotes the local economy at grass roots level in respect of the informal business sector. The study encourages entrepreneurs to pay closer attention to smaller scale niche markets as it provides opportunities for entry into the tourism and hospitality industry. However, niche market-based tourism is usually community focussed, demonstrating strong interactions with communities (Chan & Bhatta, 2013). This study contributes to tourism literature about tourism routes that are based on tourism niche markets, such as the proposed Astro Tourism route. Astronomy is regarded as a science, but as tourists are becoming more curious and are seeking to become more enlightened and educated, astronomy has huge tourism potential. The study enables future researchers and decision-makers in developing countries to replicate the development framework for similar products and rural destination development. It provides an understanding of how Astro Tourism can be used for rural destination development and plays an important role in terms of increasing community participation and ownership (Ingle, 2010).

1.7 TOURISM INDUSTRY RELEVANCE

This study aims to bring about an understanding that Astro Tourism has the potential to be a vehicle for rural development and the improvement of the livelihood of rural communities (Ingle, 2010a). The study provides recommendations that demonstrate how significant astronomical findings and the facilities of astronomy can be packaged and developed into unique products and offerings for tourism consumption.

The establishment of an Astro Tourism route was predicted by tour operators in the identified astronomical advantaged towns (Ingle, 2010a). The literature review provides a foundation through which the empirical research process attempts to validate and present a framework for an Astro Tourism route in a developing context and in conjunction with the consolidated expertise and inputs from the relevant stakeholders. The proposed framework adds to the sustainable development of rural areas and presents guidelines to improve the governance of destination development in rural areas.

1.8 DELIMITATIONS

The study investigated tourism route development with a special focus on Astro Tourism. Therefore, the literature review and the empirical research process aimed to address the relationship between the respective role-players and the theoretical aspects underpinning these factors. This research study was conducted with the following delimitations in mind:

- a) The theory of sustainability was observed only in the context of rural development;
- b) Rural tourism was only observed to substantiate the notion of tourism routes;
- c) The case study was limited to the SALT and SKA projects and excluded other astronomical attractions in urban areas in South Africa, such as other scientific sites in the country and the planetariums in Johannesburg and Cape Town;
- d) The perimeter of the empirical data collection was limited to the towns that fall within the Astronomy Geographic Advantage Act. This study only focused on those towns, (Loxton, Sutherland, Williston, Fraserburg and Carnarvon) with tourism potential in close proximity of the two catalytic astronomical projects, the SALT and SKA;
- e) The participants in the research study were limited only to those who were directly affected by tourism development activities relevant to the case study, namely, to the tourists, local communities, tourism product owners and government representatives as well as the key tourism and astronomy stakeholders in the Karoo region.

1.9 OUTLINE OF THE THESIS

An outline of the chapters included in this study, together with a summary of the context is outlined in Table 1.

Table 1: Outline of the thesis

No	CHAPTER	SUMMARISED CONTENT
1	Introducing the Research	The research study starts by introducing the research problem, the purpose statement and research objectives. This chapter provides a layout of the research study as well as definitions of key concepts.
Literature Review		
2	Sustainable Rural Tourism Development	Rural tourism development is the core rationale of this study and is observed, in the South African context, in this chapter. For this study, it is important that developmental initiatives have lasting beneficial effects on the local economy and the natural environment.
3	Tourism Routes and Niche Markets	Rural areas are known to be vast and that tourism routes are an effective and economical way for the development of rural areas. This chapter observes the tourism routes which are niche market-based. The Astro Tourism niche has very similar characteristics to other niche markets in the tourism industry.
4	Astronomy In The Context of Tourism	This chapter investigates the development of astronomy as an ancient heritage, including space and celestial tourism. It also observes the two astronomical projects that are envisioned as catalyst attractions for the proposed tourism route, i.e. the SKA and SALT.
Empirical Research		
5	Methodology	This chapter depicts the research design and methodology that substantiate the research study. This chapter describes the data collection sample and the data capturing and analysis processes followed. Furthermore, this chapter discusses the research ethics and rigour considered necessary during this empirical process.
6	Research Results	The findings provide the trends and patterns of astro tourists as a niche market. This chapter provides the outcome of the Important Performance Analysis as a good situational analysis of the tourism destination. This chapter also discusses the stakeholder perspectives of Astro Tourism in respect of rural route development.
7	Recommendations and Conclusion	This chapter revisits the objectives of the research study. Recommendations in respect of the proposed Astro Tourism route development framework are discussed. The perspectives of the various stakeholders are consolidated in line with the theoretical themes identified in the relevant literature. This chapter provides a summary of the thesis, the contribution this research has made to the literature and the tourism industry, as well as the limitations and suggestions for future research.
8	List of References	Acknowledgement of the resources used to substantiate this research study.
9	Appendices	This research study includes examples of the research instruments used, data coding, analysis and proof of communication and letters of consent.

Source: Researcher's own construction

CHAPTER 2: SUSTAINABLE RURAL TOURISM DEVELOPMENT

2.1 INTRODUCTION

In this chapter, sustainability is discussed in the context of rural tourism development. For decades, the notion of sustainability has been a challenge for many developing destinations in peripheral areas (Espiner, Orchiston & Higham, 2017:1). Many scholars agree that "... rural areas are heterogeneous" (Holland, Burian, Dixey & January, 2003; Okech *et al.*, 2012:40; Polo Pena, Jamilena & Molina, 2012:1046; Rural Tourism Strategy, 2012:18; Viljoen & Tlabela, 2006:2). Although heterogeneity is present, there is one distinct feature common to all, which is that visitors to rural areas have an authentic interaction with the natural environment, and over and above this, actively participate in the activities, traditions and lifestyles of the local communities (Huimina & Ryan, 2012; Okech *et al.*, 2012; Viljoen & Tlabela, 2006). Sustainable tourism places emphasis on the "...spatial (local-global impacts) and the temporal (sustained for how long?) scales, identification of beneficiaries (sustained for whom?) and the intent (what is to be sustained?)" (Espiner *et al.*, 2017:1). As a means of addressing the aim of this study, it became important to examine the relevant theories relating to sustainable tourism. The theoretical framework is reviewed in the context of local economic development in combination with destination situational analyses, the complexities of multi-stakeholders and community development in the context of community participation and Pro-Poor Tourism.

2.2 SUSTAINABILITY IN THE RURAL TOURISM CONTEXT

Development is an extremely complex and multidimensional concept (Barbieri, 2013; UNDP, in UNWTO, 2015). Sustainable development is defined according to the UN Brundtland Report of 1987, as "... development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brokaj 2014:107; Espiner *et al.*, 2017:2; Flint, 2010:49; Laitamaki *et al.*, 2016; Kunaeva, 2012:20;

Manwa, Saarinen, Atlhopeng & Hambira, 2017; Marschall, 2012:725; Sprangel, Stavros & Cole, 2011:40; World Commission on Environment and Development, 1987; Zolfani *et al.*, 2015). Sustainable development is, therefore, the process of change, aiming to satisfy human needs and aspirations, while protecting the natural environment and ensuring the economic viability of communities. It is important that the various stakeholders involved support and understand the discipline of sustainable development, from the level of the decision-makers to grass-root levels. Good governance and collaboration that entrenches indigenous principles is unambiguously necessary for the positive outcome of any developmental initiative (Carr, Ruhanen & Whitford, 2016; Dabphet, Scott & Ruhanen, 2012). Sustainable practices differ from region to region. Whether the application of these practices focus more on the economic, social or environmental aspects of sustainability, they all fall within the domain of sustainable development. This is because each stakeholder group differs in experience and perception and, therefore, concentrates on the different aspects of sustainable development that are relevant to their respective regions. Understanding the concept as well as the associated roles and responsibilities enhances the social interactions that will, in the end, strengthen the local development process (Dabphet, *et al.*, 2012; Puhakkaa, Sarkki, Cottrell & Siikamäkia, 2009). The following basic principles of sustainable development are recorded in the UN Brundtland Report (as interpreted by Khovanova-Rubicondo, 2012):

- Holistic planning and strategy;
- Preserving essential ecological processes;
- Protection of human heritage and biodiversity;
- Intergenerational equity; and
- Balanced fairness and opportunities between nations.

In 2015, governments across the globe adopted the 2030 Agenda for Sustainable Development, together with the Sustainable Development Goals (SDGs). The agenda provides a universal framework to address issues pertaining to extreme poverty, inequality, injustice and climate change. Building on the initial Millennium Development Goals (MDGs), the 17 SDGs and 169 targets are predominantly “... people-centred, transformative, universal and integrated” (UNTWO 2015; United Nations General

Assembly, 2015). To implement the agenda effectively, a clear framework and plan were developed, alongside finances and investment in technologies, infrastructure and human resources, which were agreed upon and committed to (UNWTO, 2015). Seventeen (17) SDGs were identified and implemented globally, especially in developing countries. The SDGs are listed below:

SDG 1: End poverty in all its forms everywhere;

SDG 2: End hunger, achieve food security, improve nutrition and promote sustainable agriculture;

SDG 3: Ensure healthy lives and promote well-being for all at all ages;

SDG 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all;

SDG 5: Achieve gender equality and empower all women and girls;

SDG 6: Ensure availability and sustainable management of water and sanitation for all;

SDG 7: Ensure access to affordable, reliable, sustainable and modern energy for all;

SDG 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all;

SDG 9: Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation;

SDG 10: Reduce inequality within and among countries;

SDG 11: Make cities and human settlements inclusive, safe, resilient and sustainable;

SDG 12: Ensure sustainable consumption and production patterns;

SDG 13: Take urgent action to combat climate change and its impacts;

SDG 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development;

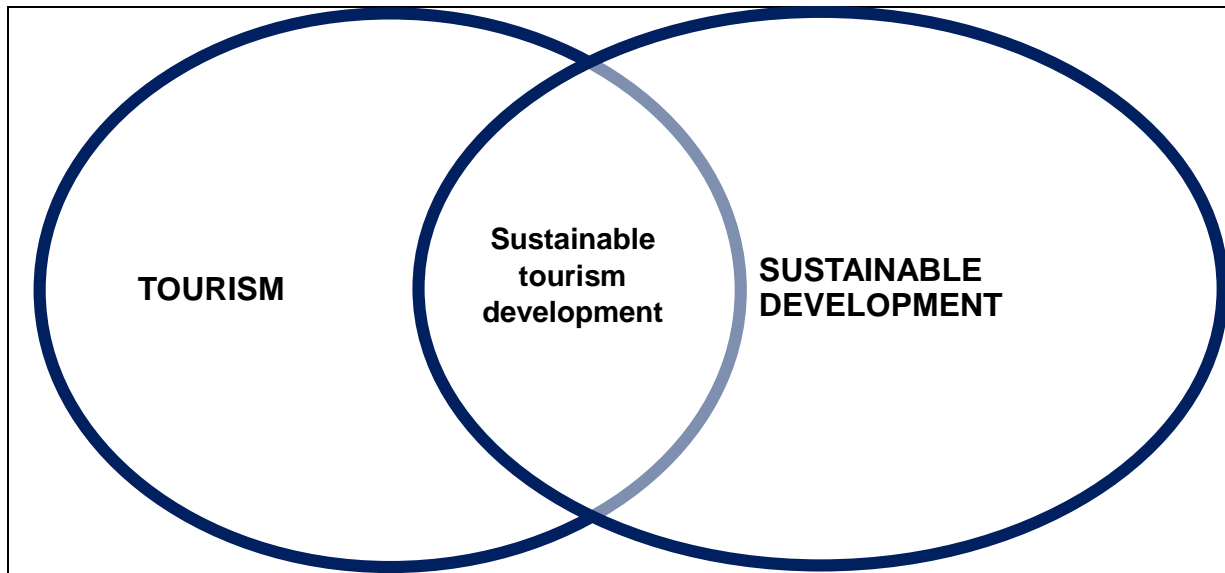
SDG 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss;

SDG 16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels;

SDG 17: Strengthen the means of implementation and revitalise the global partnerships for sustainable development (UNWTO, 2015).

Furthermore, tourism in the context of regional policy in southern Africa has been aligned to the United Nations Millennium Project goals (Saarinen, 2010). Tourism delivers a significant contribution to some of the pillars of the SDGs, as UN Secretary-General, Ban Ki-Moon declared, on World Tourism Day in 2014, that: “Harnessing tourism’s benefits will be critical to achieving the sustainable development goals and implementing the post-2015 development agenda”. The UNWTO declared 2017 as the International Year of Sustainable Tourism for Development (YI2017) (Bramwell, Higham, Lane & Miller, 2017; UNWTO, 2017). Sustainable tourism is defined as “... tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities” (Saarinen, 2014:3). Thus, sustainable tourism development considers the needs of the visitors, the tourism industry, the natural environment and the local communities (Espiner *et al.*, 2017; Eusébio *et al.*, 2014; Flint, 2010; Marschall, 2012; Muresan *et al.*, 2016; Sharpley, 2010; UNWTO, 2017; UNWTO, 2015). This research study has particular relevance, for SDG 1, SDG 8, SDG 9, SDG 12 and SDG 14. The outcome of this research relates to issues of poverty alleviation, decent work and economic growth; industrial innovation and infrastructure and self-sustainable communities. Figure 2 illustrates sustainable tourism as being a sub set of sustainable development, congruent with the statement by Saarinen (2006) and Sharpley (2010).

Figure 2: Sustainable tourism as a sub-set of sustainable development



Source: Ruddy, Gössling, Scott and Hall (2015)

Sustainable tourism is not product specific, but rather a specialised approach, where tourism is developed and managed with a particular aim in mind. The aim and implementation of sustainable tourism are oriented towards lasting tourism development and being pro-poor focussed (Puhakkaa *et al.*, 2009). This approach to sustainability is acknowledged by destination developers and in tourism literature (Saarinen, 2006). Sustainable tourism initiatives are realised by means of:

- ensuring viable, long-term operations, providing socio-economic benefits that are evenly distributed amongst all stakeholders, including stable employment, income earning opportunities and the provision of social services to host communities, as well as contributing to poverty alleviation;
- making optimal use of environmental resources that form a key element in tourism development, maintaining essential ecological processes and helping to conserve communities' built environment and living cultural heritage as well as biodiversity; and
- respecting the socio-cultural authenticity of host communities, conserving their built environment, their living cultural heritage and traditional values, while at the same time

contributing to inter-cultural understanding and tolerance (World Tourism Organisation, 2013).

Tourism destination development contributes towards infrastructure improvements and expansion as well as spin-off enterprise opportunities (Rural Tourism Strategy, 2012). Even though scholars disagree, to some degree, on the definition given to rural areas, there are some common characteristics such as:

- areas that are of low population and low economic activity;
- economic activity usually takes place in the agricultural sector;
- areas are dominated by open areas such as fields, pastures, woods and forests, mountains and deserts;
- lack of other sustainable development alternatives;
- the land is usually very affordable; and
- high transactional costs due to the vast distance away from urban areas and poor infrastructure (Okech *et al.*, 2012; Viljoen & Tlabela, 2006).

Table 2 illustrates and distinguishes between the rural or peripheral areas and core or metropolitan areas (Ursache, 2015).

Table 2: Characteristics of metropolitan and rural areas

METROPOLITAN/CORE AREAS	RURAL/ PERIPHERAL AREAS
High levels of economic activity and a diverse economic base.	Low levels of economic vitality and dependency on traditional industries.
Metropolitan in character. Rising population through in-migration with a relatively young age structure.	More rural and remote, often with high scenic values. Population falling through out-migration, with an ageing structure.
Innovative, pioneering and enjoys good information flows.	Reliant on imported technologies and ideas and suffer from poor information flows.
Focus on major political, economic and social decisions.	Remote from decision making leading to a sense of alienation and lack of power.
Good infrastructure and amenities.	Poor infrastructure and amenities.

Source: Botterill *et al.* (2002) (adapted by Ursache, 2015)

An integrated sustainable tourism planning and development approach is addressed from a destination development perspective that focuses on both local and global impacts (Kavita, 2014; Hung, Sirakaya-Turk & Ingram, 2011; Puhakka *et al.*, 2009; Saarinen, 2006). Sustainable tourism development recognises the importance of the implementation of policy and planning, a situational analysis of the destination through quality product development and adequate infrastructure as well as inclusive stakeholder involvement for the application of flexible integrated implementation of sustainable tourism development (Butler & Rogerson, 2016; Laitamaki *et al.*, 2016).

Rural areas identify tourism as a tool to revitalise the area as it contains the 'triple bottom line' that encompasses the three pillars of ecological, socio-cultural, and economic sustainability (Barbieri, 2013; Barcus, 2013; Boley, 2015:4; Sustainable livelihoods in Public Employment Programme, 2015).

In terms of SDG 7, tourism businesses are encouraged to operate responsibly, especially, in relation to energy consumption. They need to provide access to affordable, reliable, sustainable and modern (or renewable) energy for all rural communities. Modern energy, in the form of bio-digesters and small bio-gas distribution networks, stand-alone wind energy systems, improved biomass stove and solar photovoltaic systems (PV) as well as light-emitting diode (LED) lamps, are all technologies that offer a number of development opportunities for rural communities in emerging economies and developing countries. However, regardless of the benefits of sustainable energy technologies, their contribution to energy consumption, in both industrialised and developing countries, is minimal compared to the common usage of unsustainable energy technologies (Ortiz, Dienst & Terrapon-Pfaff, 2012).

The concept of responsible tourism aims to increase the number of 'green entrepreneurs' or 'ecopreneurs', where behaviour is taken into account in respect of its impact on the economic, environment and social structures of a local community (Villanueva-Álvaro *et al.*, 2017). The majority of the population should be provided with ecosystem services, such as clean water and clean air, food production and availability of fuel, as reflected in SDG 6, by ensuring the availability and sustainable management of water and sanitation for all. Yet, human actions are frequently the reason why ecosystem services are unable

to provide the services required. Thus, a decline in the efficacy of ecosystem services negatively affects the resiliency of a local community (Flint, 2010; Valdivia & Barbieri, 2014). Tourism initiatives and healthy ecosystems should strive to lower the level of consumption, pollution and waste, thereby complying with SDG 12. This is to ensure sustainable consumption and production patterns within the ecosystem, to enhance the sector and conserve the natural environment and scarce and limited resources. Climate change also plays a huge role as it is a dominant threat to the environment, society and economic development. Destination development plans should consider the effects that climate change will have on the natural environment and recognise that measures need to be taken prior to extremely damaging consequences materialising for both the environment and local communities (UNWTO, 2013), thereby complying with the injunction stipulated by SDG 13 to take urgent action to combat the impacts of climate change.

Climate change, such as extreme temperature, fog, wind and humidity, has had an enormous impact on all in South African industries, and the agricultural and tourism sectors, in particular. The agricultural sector's reliance on water is substantial with the result that the extreme drought experienced, over the past years, has negatively affected the supply of local crops and caused high food prices. Furthermore, climate change has also affected the tourism industry, especially where tourism businesses provide water related activities. Such businesses suffer the most, as water is predominantly reserved for residential usage, rather than leisure activities. In addition, the accommodation sector has also been affected due to water restrictions, for example, bath-tub plugs being removed to limit water consumption and restricting the use of swimming pools.

2.3 POLICY AND GOVERNANCE

Policies and good governance are imperative in the regulation of development initiatives in a specific area (Chang, 2011). Policies and governance guide destination developers in the effective management of all the resources and the preservation of sensitive cultural values, beliefs and practices as well as the natural significance of the respective areas (Gartner, 2005; UNWTO, 2013). Therefore, sustainable rural development should be

implemented locally and nationally, being part of the prioritised policies that support the development of rural areas through tourism (Gartner, 2005). Tourism management includes a vision, rules and regulations with active development strategies. The rules and regulations refer to the respective zoning of the destination, legislation and guidelines, approval, licensing and control of tourism activities as well as the use of economic instruments and identifies opportunities and threats (Laitamaki *et al.*, 2016; UNWTO, online).

The Comprehensive Rural Development Programme (CRDP, 2009) is a strategic priority programme of the South African government to build vibrant, equitable and sustainable rural communities. The CRDP differs from past government strategies, as it has now developed a more “... proactive participatory community-based planning approach ...” based in the rural areas (CRDP, 2009:3).

Rural communities in South Africa now have an opportunity to participate fully in the economic, social and political life of the country (NDP, 2012). Land reform, job creation and improved agricultural production all support the development of rural economies (SDG 8). The discussion therefore focuses on the context of governance in South Africa and could possibly be globally relevant for developing countries. The assumption that South Africa, as a developing country, has made considerable progress in rural development is nonetheless debatable. Economic, socio-cultural and environmental integration and transformation have not yet been fully realised. This is because South Africa’s rural areas are still characterised by high levels of poverty and unemployment and low levels of education and income (Butler & Rogerson, 2016). Limited opportunities for improving people’s quality of life, has led to high levels of migration to metropolitan areas, such as Gauteng and the Western Cape Provinces.

In order to address the challenges of rural development and accommodate the UNWTO principles, the different spheres of government have elevated the importance of tourism planning through their Integrated Development Plans (IDPs), Spatial Development Framework (SDFs) and the Provincial Growth and Development Strategies (PGDP). The SDF is a very crucial planning document for local municipalities (localised government) where the prioritised developmental projects are budgeted for within achievable

timeframes. Unfortunately, due to the limited financial resources at local authority level, municipalities have been unable to fund and produce the plans and strategies that are required for the implementation of the IDPs and SDFs. This situation has resulted in an adverse knock-on effect in respect of town planning and rural development.

The Medium Term Strategic Framework (MTSF) is South Africa's strategic plan for the 5-year electoral term of government. The MTSF echoes the twelve national priorities, in the form of government outcomes contained in the election manifesto of the governing party. Also reflected in the MTSF is the implementation plan of the National Development Plan (NDP). The NDP was developed to eliminate poverty and reduce inequality in South Africa by 2030 (NDP, 2012).

The Constitution (Act 108 of 1996) regards rural development has a concurrent national and provincial responsibility that overlaps with the Comprehensive Rural Development Programme in Schedule 4 (Part A), which, in turn, outlines the function of local government, namely, "... that a municipality has the right to govern, on its own initiative, the local government affairs of its community, subject to national and provincial legislation as provided for in the Constitution." Central to the Comprehensive Rural Development Programme, is the creation of employment opportunities and provision of skills training. The South African government employment creation model is contained in the Expanded Public Works Programme (EPWP). This model comprises of three phases:

Phase One: this being the incubator where the main objective is 'meeting basic needs';
Phase Two: regarded as the entrepreneurial development stage and the development of medium to large scale infrastructure; and lastly,
Phase Three: which is the emergence of rural industrial and financial sectors that are marketed by SMMEs and village markets (CRDP, 2009). All aspects of rural life should be included in the planning and implementation phases.

2.3.1 Tourism Industry Related Policies in South Africa

As a developing country, the South African government recognises the importance of tourism for the national economy. As a result, tourism features as one of the priority areas in the Industrial Policy Action Plan (IPAP, 2007), the New Growth Path (NGP, 2010) and the National Development Plan (NDP). The National White Paper Development and Promotion of Tourism in South Africa (1996:18), states that "... there is an urgent need to create sustainability of the Reconstruction and Development Programme" (RDP). "The tourism industry, more than any other industry, can provide sturdy, effective and sustainable legs for the RDP to walk on" (Briedenhann & Wickens, 2004:190). The Tourism Bill describes the challenges found in the tourism sector as: "... the fragmentation of tourism planning across the three spheres of government; the inadequate databases of tourism businesses and the products, services and facilities they provide and its associated lack of reliable market information; and the poor integration of tourism with other sectoral policies". It focuses on further industrial growth and sustainable job creation (Tourism Bill, 2011:24).

The first National Tourism Sector Strategy (NTSS) for South Africa was approved by the South African Cabinet in 2011. The NTSS is a guiding document for the development, promotion and transformation of tourism in South Africa in all three spheres of government (local, provincial and national). The NTSS ensures relevance in a dynamic and rapidly changing global environment, it being aligned with the National Development Plan (NDP, 2012) and the Tourism Act No. 3 of 2014. The White Paper on the Development and Promotion of Tourism in South Africa (DEAT, 1996) promotes the growth of responsible and sustainable tourism (Ashley & Roe, 2002; Viljoen & Tlabela, 2006). Furthermore, the strategy emphasises the need to support the geographic spread of tourism products, especially projects that pro-actively include rural communities (Rural Tourism Sector Strategy, 2012). The revised National Tourism Sector Strategy (2017) also indicates that a number of major trends have been identified as having a noteworthy impact on the world tourism economy, of which one is specifically applicable to this case, namely, an "... increasing interest in green, sustainable, responsible and ethical tourism.

Increasingly tourists are choosing to reduce negative environmental, economic and social impacts on the host country. They prefer to choose destinations showing clear benefits towards the rural communities, and having a minimal negative environmental impact” (NTSS, 2017:4). The NTSS focuses on harnessing the strengths of the public and private sectors to ensure alignment between all the parties concerned and the most effective use of resources as well as drawing on pragmatic planning and the prioritisation of the matters in question (NTSS, 2017). Although the NTSS is a remarkable strategy for redressing the geographic spread of tourism development and the issue of transformation, it is yet to be implemented in practice. Implementation of the deliverables of the NTSS has become problematic for the local and provincial tourism practitioners, as very limited consultation took place with the industry during the development of the strategy. Primarily, the strategy is centred on a public sector point of view and not one that is based on a holistic approach in cooperation with the tourism industry.

In addition to the NTSS, the National Department of Tourism developed the Rural Tourism Strategy (2012) to initiate a developmental approach for the packaging of rural tourism products designed specifically for South Africa. The Rural Tourism strategy places emphasis on the broader concept of economic viability, which necessitates the impact driven principles of sustainability, responsible tourism and PPT. However, there is no indication as to how these impacts could be measured. Nonetheless, the strategy presents a balance between short and long-term developmental objectives, between the needs of the community, the economy and the environment, in line with the UNWTO ‘triple bottom line’ approach mentioned previously. The Rural Tourism Strategy is aligned with the national priorities of the MTSF and the twelve government outcomes with particular reference to the following outcomes:

Outcome 4: Decent employment through inclusive economic growth;

Outcome 7: Vibrant, equitable and sustainable rural communities with food security for all); and

Outcome 11: Create a better South Africa and contribute to a better and safer Africa and World.

If rural tourism development policies are not reinforced, the implementation thereof will hardly be effective, and have no real impact. Rural areas require the implementation of policy regulations in order to address developmental needs, such as training, job opportunities and entrepreneurial prospects. These developmental needs may become even more unobtainable due to a lack of human capacity and financial resource allocation. In many instances, in addition to the lack of resources, no tourism management or development plan is in place for local rural areas. The reason for the lack of such a plan is that the tourism sector is not fully recognised as a sector that can contribute to the local economy.

2.3.2 Science and Astronomy Related Policies in South Africa

The White Paper on Science and Technology (1996) acknowledges that the establishment of a sustainable System of Innovation (NSI) will develop a society that values, appreciates and understands science and technology as social tools for sustainable development. The National Research and Development Strategy (NRDS, 2002) is a strategy of commitment, published by the Department of Science and Technology (DST). The DST established the Institute for the Promotion of Science through the transformation of the Foundation for Engineering, Science and Technology. The NRDS highlights the need for investing in the promotion of science and the need to “... make science attractive, accessible and relevant through the media, public engagement and promotional programmes” (Science Engagement Framework, 2014). This can be achieved by an increasing familiarity with the natural world and promoting an understanding about some of the key science and technology concepts. The Science Engagement Framework (2014) was developed by providing a strategic framework to improve science and technology awareness. Nurturing the ability of individuals and communities to use science and technology for personal, social, economic and community development and demonstrating the impact of science, engineering and technology are also significant (Science Engagement Framework, 2014).

In line with the above developments, the aim of South Africa's National System of Innovation (NSI) is to contribute towards the establishment of a sustainable and thriving society with lasting beneficiation for all. The National Development Plan (NDP, 2012:70) highlights science and technology as two of the key drivers of development in its statement that: "Developments in science and technology are fundamentally altering the way people live, connect, communicate and transact, with profound effects on the economic development. Science and technology are key elements in development, because technological and scientific revolutions underpin economic advances, improvements in health systems, education and infrastructure" (NDP, 2012:93).

Furthermore, the DST has adopted a Strategy for Human Capital Development for Research, Innovation and Scholarship to assist with promotional activities for the public (Science Engagement Framework, 2014). The National Research Foundation (NRF) agreed to review the need for a strategic plan for astronomy and the associated human capital requirements and to cover existing developmental areas, such as National Astronomy and Space Science Programmes, Multi-wavelength Astronomy and radio-astronomy (Bharuth-Ram, 2009). The DST has partner institutions that implement science awareness programmes. These include the South African Agency for Science and Technology Advancement (SAASTA), which is a business unit of the National Research Foundation (NRF), various higher education institutions, a network of science centres as well as the tourism industry, non-governmental organisations and professional bodies. The Human Science Research Council (HSRC), also a DST entity, is integral to the monitoring and evaluation processes that are linked to the implementation of the DST's science engagement programmes (Science Engagement Framework, 2014).

Whilst policies, development strategies and frameworks, together with councils and foundations, amongst others, are in place in South Africa, what is lacking are efforts to coordinate the advancement of science promotion and technology. Such coordination is particularly required across the various governmental departments and its entities, other associated governmental departments, universities, science councils and museums as well as partners in the private sector. Effective execution of a particular framework that integrates all fields of knowledge, such as the natural sciences, engineering, social

sciences and humanities, is also lacking. Furthermore, the public sector has, so far, not even come close to reaching the tipping-point in its efforts to draw from a wider social scientific perspective. The value of public engagement and the public's progressive understanding of advances made in science and modern technology is yet to be investigated.

2.4 SITUATIONAL ANALYSIS OF A SUSTAINABLE RURAL DESTINATION

The relationship between tourism and the natural and cultural heritage is critical to the concept of sustainable tourism development. The natural and cultural assets of a destination are, predominantly, the main reason why tourists visit rural areas. The preservation of these assets, such as the landscapes, rich biodiversity, unique heritage sites and indigenous cultures, are of absolute importance if tourism is to be sustainable. Therefore, tourist activities should not harm these assets in any way, but rather provide the means to nurture them by means of increasing awareness and generating income for the local economy (UNWTO, 2013).

To assess a destination's potential for sustainable tourism development a strength, weakness, opportunities and threat (SWOT) analysis is recommended by Fayos-Solé, Marín, & Jafari (2014). However, Sprangel Stavros & Cole (2011) suggest that the Strengths, Opportunities, Aspirations and Results (SOAR) approach is much more effective. The reason for this evolution is that modern developers, globally, are moving away from the diagnostic perspective to a dialogic perspective, which is a strategic way of thinking, is innovative and leads to transformation in this century (Hamel & Prahalad, 1996; Hitt, Keats, & DeMarie, 1998; Kim & Mauborgne, 2005; Lowendahl & Revang, 1998; Stavros & Wooten, 2011). Although this research articulates the motivational SOAR analysis by Stavros and Cole (2013), it might pose difficulties for tourism practitioners and orthodox tourism developers and practitioners, as they might be better acquainted with the SWOT analysis. The introduction of a new method of analysis, such as the SOAR analysis, might require an unwelcome and deeper level of creativity in respect of the SOAR approach. They may also find this method too contemporary. The manner in which the SWOT and SOAR approaches differ is illustrated in the table below:

Table 3: Comparison between SWOT and SOAR

SWOT	SOAR
Focus on Weaknesses and Threats	Focus on Strengths and Opportunities
Competition focus – “Just be better”	Potential focus – “Be the best possible”
Incremental improvement	Innovation and value generation
Top down	Stakeholder Engagement
Focus on Analysis Planning	Focus on Planning Implementation
Energy depleting	Energy creating
Attention to Gaps	Attention to Results

Source: Stavros and Cole, (2013) (adapted from Stavros & Hinrichs, 2009:29)

The SOAR analysis is a more action orientated strategic planning tool that focuses on strengths and seeks to understand the entire destination and its development, including inputs from all the relevant stakeholders. The SOAR analysis includes the Five-to-One (5-I) Approach (*stands for initiate*), *inquire (into strengths)*, *imaging (the opportunities)*, *innovate (to reach aspirations)* and *inspire to implement (to achieve results)* (Capela & Brooks-Saunders, 2008; Stavros & Cole, 2013). Sprangel, Stavros & Cole (2011) explain the SOAR framework as follows:

Initiate: comprises the core planning team who initiate the project plan and identify the key stakeholders, including their expected roles and responsibilities;

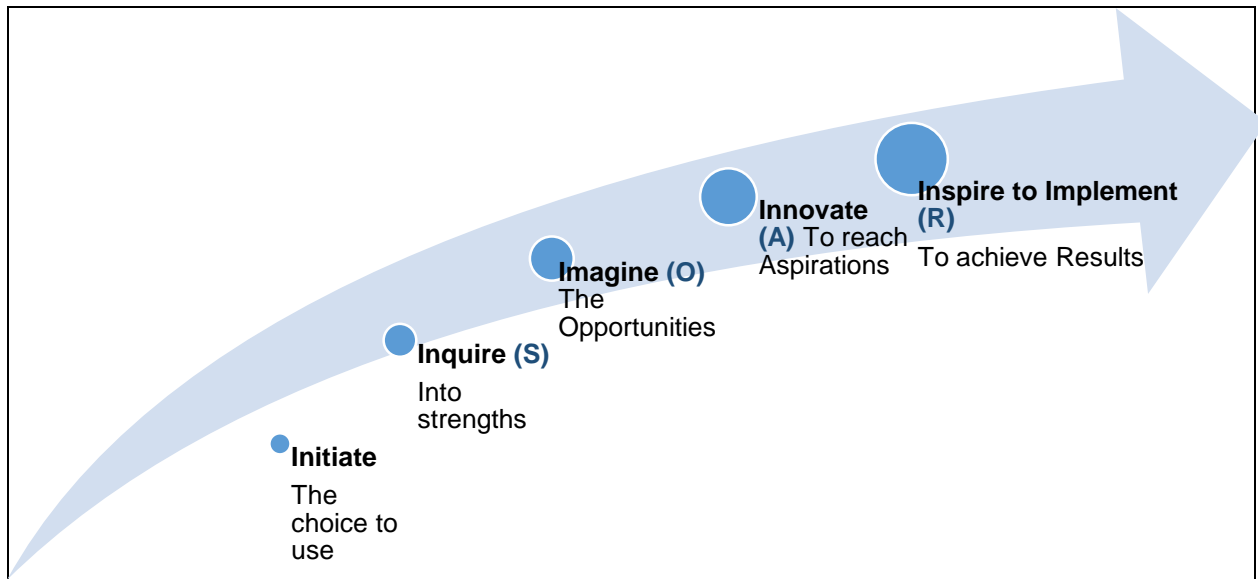
Inquire: the process where analyses are conducted concerning the external realities as well as the internal capabilities;

Imagine: the planning team co-create the values, vision and mission of the initiative and identify the potential outcomes and possible innovations;

Innovate: the strategy and strategic initiatives are drafted and tactical plans and programmes are presented;

Implement: finalising the goals and objectives through a consultative process and where systemic continuous improvements are monitored and regulated.

Figure 3: SOAR Elements



Source: Stavros and Cole, 2013 (adapted from Stavros & Hinrichs, 2009)

Along with SOAR, a PESTEL analysis is recommended to measure the developing area, outside the tourism industry (Chaoprayoon & Panyadee, 2013; Fayos-Solé *et al.*, 2014). Once the aspirations and anticipated results are identified, the destination policy makers and implementers include a strategic framework that analyses the market conditions, attracts visitors by means of delivering a high standard of satisfaction and ensuring sustainable development at the proposed destination. The proposed framework addresses issues of sustainability, knowledge transfer, quality and excellence, product development and promotion, innovation and creativity and stakeholder cooperation as well as effective governance (Fayos-Solé, Marín, & Jafari, 2014).

Monitoring indicators is a process that is crucial for sustainable tourism development. Monitoring verifies whether the goals, objectives and tourism management plans are effectively implemented (Green, Hunter & Moore, 1990). The process detects weak points that need to be attended to as well as the strengths, which can be expanded. Visitor management is important, as it provides an understanding of how visitors experience tourism activities and indicate the satisfaction level they gain from the destination's infrastructure. Visitor management also includes an assessment of the negative impacts of development on the natural environment and local cultures (Chaoprayoon & Panyadee, 2013). Basic bulk infrastructure services provided by local government, such as roads,

sanitation, waste management, water and electricity are important as they create an enabling environment for the operation of tourism businesses and tourist activities. Tourism logistics management, together with creative tourism, play a collaborative part in linking the industry to the daily livelihoods of local communities (Binns & Nel, 2002; Chaoprayoon & Panyadee, 2013; Rogerson, 2004, 2006).

When referring to small rural town development, historically disadvantaged communities have to work alongside LED initiatives and the private sector to empower and enable them to make their heritage and culture work to their advantage. Local tourism development ought not only focus on marketing one product but rather look at destination development in its entirety. New and unique attributes of any destination are the entities that pull entrepreneurs, investors and tourists towards each other for destination development (Gartner, 2005). The potential tourism products ought to be considered together with determining the interested target markets and then the development, packaging and marketing of the tourism products occurs. (Gartner, 2005).

Furthermore, the development and promotion of the destination's brand image and the variety of products and services offered have to maintain a competitive status within the tourism industry. The destination's brand awareness needs to be continuously measured to investigate awareness about the level of satisfaction, or otherwise of the product and to assess whether it has any positive or negative connotations that are associated with its brand (Maumbe & van Wyk, 2012). Marketing efforts, together with local economic development, can act to re-brand the image of a destination and improve the local economic status and competitive advantage of an area (Binns & Nel, 2002; Chin *et al.*, 2016).

2.5 LOCAL ECONOMIC DEVELOPMENT

In the global context, it is questionable as to whether South Africa is truly a pioneer in prioritising local economic development planning and the implementation of pro-poor local economic development (Donaldson, 2007; Rogerson, 2006). In order to achieve pro-poor local economic development, the focus should be related to community based

development, small enterprise development and local development (Rogerson, 2006), which, in practical terms, has hardly been realised. A South African government priority is that Local Economic Development (LED) is imperative for the nation to reduce poverty and reach certain sustainable development goals. The LED Policy Document was, therefore, drafted in 2002, with the subtitle “Refocusing Development on the Poor”, and concentrating on low-income communities that were previously disadvantaged. There are six ‘developmental’ LED strategies in the policy document, comprising of “... community-based economic development; linkage; human capital development; infrastructure and municipal services; leak plugging in the local economy and retaining and expanding local economy activity” (Rogerson, 2004, 2006).

The national government recognises the crucial role local economic development plays in overcoming the challenges posed by local development projects, especially, in rural areas. In terms the 1996 Constitution of the Republic of South Africa and the 1998 White Paper on Local Government, the concept of a ‘developmental local government’ was determined and legislated as an obligatory mandate required from all South African local municipalities (Ndabeni & Rogerson, 2016). Binns and Nel (2002) indicate that local economic development is a necessary process in which local government and communities jointly use their existing resources and venture into a partnerships with the private sector. By so doing, they empower the local communities by creating employment and stimulate economic activity in a specific area, which is in accordance with SDG 17’s injunction to strengthen the means of implementation and revitalise global partnerships for sustainable development (Cole, 2006). The main features of LED are to continually seek economic growth opportunities in rural areas and aim to diversify the local economic base. LED has proven to be effective when it includes local traditional leaders, key local stakeholders and the emerging entrepreneurs in a destination (Binns & Nel, 2002; Viljoen *et al.*, 2010).

In the context of local economic development, rural tourism complements traditional agricultural activities in rural areas (Aref, 2011; Greffe, 1994; Rogerson, 2004; Scheyvens, 2007; UNWTO, 2015). According to Rogerson (2012), rural economies usually suffer from their total reliance on agricultural production and small and scattered

unorganised enterprises. The early scholars of rural tourism indicated that the greatest concern is accessibility to these rural and peripheral areas and that rural development, does indeed, play a crucial role in overcoming these obstacles. Belisle (1983) was one of the first scholars to address the lack of a relationship between tourism and food production (Rogerson, 2012). Rogerson (2004, 2006, 2007 and 2012), along with Torres and Momsen (2004), have conducted research with regard to tourism and its relation to local food production. It was noted that the links between tourism and the poor should be strategically structured. Critical features ought to be practically improved to impact positively on the livelihoods of the poor in areas such as accommodation, agricultural supplies for food and beverages, retail and local transport (Trejos & Chiang, 2009). Local farmers in developing countries are in a good position to supply local tourism businesses with food products and the provision of food products that involve utilising the productive assets of labour and land of the local community (Rogerson, 2012). Implementation focus on the improvement of produce quality and variety, which in the end, creates an enabling opportunity for local economic growth (Mitchell & Faal, 2007).

Generally, food and related services are sourced from service providers that offer the most affordable, reliable, and easily accessible service and assurances regarding high quality. The preferred service providers are usually large established suppliers from cities outside of the rural area, which affects the businesses of local suppliers and limits opportunities for growth in the local economy (Rogerson, 2012). Negative impacts also include the diversion of land and water resources, competition for labour, degradation of the natural environment, traffic congestion, noise and air pollution and over-crowding (Chan *et al.*, 2016; Rogerson, 2012). Tourism functions should be a complementary activity to the traditional economic activities of a local community in order to give local residents the opportunity to promote, manage and develop themselves (López-Guzmán, Borges & Hernandez-Merino, 2013).

Integration between tourism and agriculture has led to the emergence of a tourism niche called agri-tourism. The synergy between tourism and agriculture is easy to discuss, but has proven difficult to implement, as it should be a priority for both the tourism and agricultural sectors (Torres & Momsen, 2004). Agri-tourism is a very important component

of rural tourism, attracting visitors to farms and agricultural operations (Barbieri, 2013; Gil Arroyo, Barbieri, & Rozier Rich, 2013; Ollenburg & Buckley, 2007). The niche consists of agricultural business enterprises and the offering of unique experiences and active participation at their agricultural locations (Rural Tourism Strategy, 2012). Agri-tourists visit a working agricultural setting such as a farm or ranch for leisure, recreation or educational purposes. Activities offered on farms and ranches include an appreciation of nature and agriculture such as orchard tours, wildlife observation and educational activities as well as school tours, culinary lessons and recreational harvesting, for example, harvest picking, grape pressing and fishing as well as other outdoor recreational activities (Valdivia & Barbieri, 2014). The various types of activities in agri-tourism are classified according to different sets of criteria. There are three types of operations based on the level of the farmers' involvement in tourism activities. These are categorised as follows:

- Farms with farmers with minimal customer interaction, such as roadside stalls;
- Farms with programming activities to meet the needs of visitors, such as corn mazes.
- Farmers with more complex and direct interaction with customers, such as full service restaurants (Valdivia & Barbieri, 2014:19).

As the above mentioned types of agri-tourism base their products and services on the needs of tourists and the type of agricultural activity, it is clear that agri-tourism is not a standardised recreational activity, but is formulated according to the underpinning motivation of the agri-tourists. Motivations vary from enjoying agricultural experiences, relaxation in a rural setting, quality of life, relationships and adventure seeking (Chin *et al.*, 2016; Valdivia & Barbieri, 2014).

Agri-tourism has the potential to be a viable entrepreneurial initiative as it delivers a variety of benefits with regards to the 'three pillars of sustainability' (Barcus, 2013). In respect of the socio-cultural dimension, agri-tourism strengthens the family farm, preserves rural heritages and conserves customs and traditional artefacts and the architecture of minority groups. It increases community pride and patriotism, uplifts the social status of farms, empowers female farmers and nurtures relationships across cross-cultural and racial groups. As far as the environmental aspect is concerned, agri-tourism

assists with the protection of natural habitats and ecosystems, conserves water sources, reduces environmental destruction and improves the village scenery and built infrastructure. Concerning economic matters, agricultural activities create jobs, increase profits and household incomes as well cross-marketing opportunities with other farms (Barbieri, 2013; Hegarty & Przezborska, 2005; McGehee, 2007; Tew & Barbieri, 2012; Yang, 2012). While agri-tourism seems to offer many beneficial opportunities, it also faces challenges, such as financial constraints, lack of professionalism and a knowledge about the tourism industry in conjunction with fewer linkages to professional network products (Valdivia & Barbieri, 2014).

2.6 THE MULTI-STAKEHOLDER APPROACH

Tourism is perceived as a complex phenomenon involving a variety of participant interactions that can be translated into 'stakeholder theory' or 'stakeholder approach' (Saftić, Težak & Luk, 2011). Saftić, Težak and Luk (2011) recommend that the term 'stakeholder approach' is more appropriate as it correlates with the concepts, ideas and opinions that are based on interactive discussions between the respective stakeholders. On the other hand, stakeholder theory refers to a set of properly reasoned ideas which deliberates about actual facts. The stakeholder approach includes a process that commences with the identification of the various stakeholders, such as the local communities, agricultural sector, local tourism businesses, tour operators and tourism agencies as well as local businesses, such as retail and wholesalers, local government and administration, academics, the media and tourists. Thereafter, is it imperative to manage and understand these groups and their different roles and associated responsibilities. Stakeholder collaboration becomes problematic, when tireless effort, energy and time is required to manage these relationships. Therefore, for the sake of continuous progress and sustainable growth, it is important to identify the primary and secondary stakeholders (Saftić, *et al.*, 2011). It is also important to understand that regardless of whether they are primary or secondary stakeholders, all stakeholders, to a certain degree, are responsible for the implementation of destination directives and

product development as well as for making a contribution towards more sustainable initiatives (Eusébio *et al.*, 2014; Laitamaki *et al.*, 2016).

As previously mentioned, in order for rural tourism to be effective, all the tourism stakeholders have to be involved and included whilst developing the tourism offerings and products that complement the core tourism attraction and agricultural activities. It is preferable that tourism stakeholders develop mainstream upmarket products where the pro-poor component comes from a shared ownership of a venture that provides inputs into the destination strategy by strengthening linkages between the rural communities, businesses, private and public sectors and local producers (Ashley & Roe, 2002). Formalisation of linkages with rural communities by other tourism agencies, is a very difficult task as many communities might not be keen to engage in such inter-stakeholder initiatives.

According to Suni, Musa and Rifdan, (2015), the implementation of partnerships in the tourism industry generates both positive and negative impacts for rural communities. Positive impacts include an increased number of tourists and an increased number of jobs being created, both of which bring about increasing levels of income. Partnerships are believed to be a solution for the government, the private sector and the general public to make sure sustainable development goals are met (Sun *et al.*, 2015). The approach involves all stakeholders in the development of areas to market and manage initiatives in the tourism industry. It is an essential factor for sustainable development, greater social responsibility, environmental sensitivity and economic sustainability (Haukeland, 2011).

Trust takes time to build, but can also easily be broken. Thus, it is important to maintain continuous communication and consultation with all the stakeholders involved. Co-creation of tourism experiences, which should be based on the integration of all the stakeholders, is frequently lacking. Co-creation leads to the ability to solve difficulties that arise in the promotion of sustainable local development (Aref, 2011; Ashley & Roe, 2002; Chantamool, Laoakka & Phaengsoi, 2015; Haukeland, 2011; Kastenholz & Figueiredo, 2014; Viljoen *et al.*, 2010). Numerous challenges are experienced by tourism practitioners in that opposing points of view regarding sustainable tourism development exist, deriving from the fact that some stakeholders are seen to be more important than others as they

are financially more invested in the tourism industry (Dabphet, 2012). Thus, it is evident that influence, power and saliency become matters of concern. An understanding the dynamics of the various stakeholders is, therefore, of paramount importance (Lyon *et al.*, 2017).

Standards should be set at an acceptable level for the successful planning of partnerships and should subsequently be met. The standards on which tourism development thrive are representativeness, ownership and mutual trust (Haukeland, 2011:140). The conception of ownership implies that responsible involvement in the planning process will most likely lead to loyalty, thereby giving rise to opportunities for collaboration and co-management. If standards are met, mutual trust amongst the various stakeholders is inevitable.

Good governance is expected where the public and private sector work alongside each other to provide a service despite the nature of the projects. This type of partnership could be justified by government as it is cost efficient. Shared responsibility provides better quality of services and spreads the risks to the private sector (Wilson *et al.*, 2009). Partnerships in rural areas can be found in either a commercial or a non-commercial form. Non-commercial partnerships take place, particularly, when tourism organisations, destinations or government policymakers work together with community groups, environmental groups, government agencies and other non-profit stakeholders in order to address a common problem or goal. Commercial contracts or the legal nature of partnerships occur when a small body or organisation starts to critically analyse commercial partnerships and stakeholder relationships between public organisations, for example, protected areas and the tourism industry. Thus, the focus shifts to partnerships where business relationships are binding commercial contracts or legal arrangements based on voluntary and collaborative actions (Wilson *et al.*, 2009:271). With successful partnerships and cooperation between the public and private sectors as well as the local communities, sustainable tourism in any destination is possible (Aref, 2011; Briedenhann & Wickens, 2004; Viljoen *et al.*, 2010).

Furthermore, it is very important that the roles and responsibilities of all stakeholders are clearly defined and agreed upon. Partnerships between the communities and the tourism sectors are supposedly effective if there is a mutual understanding between all the parties

involved (Chantamool *et al.*, 2015). Unfortunately, mutual understanding is difficult to achieve and differs from case to case as tourism ventures are driven by various agendas. The public sector is usually focussed on destination development, in its entirety, through tourism infrastructure, road access and accommodation. While local communities are driven by the desire to improve their quality of life and tourism businesses want a competitive advantage by focussing on increased revenue and improving their marketing efforts (Dabphet, 2012).

Stakeholder relationships are often of a sensitive nature as they require cautious management in order to attain sustainability and political acceptance. Despite the benefits, private business is also a contentious matter. Local communities and environmentalists are usually very concerned that the profit motive will take preference over development and the protection of their environment and cultural heritage. It is believed that tourism development does not usually acknowledge and respect the culture, traditions and values of local communities (Manwa *et al.*, 2017). Moreover, they are concerned that the products of tourism will be over-commercialised and that any negative outcomes arising from the Public Private Partnership (PPP) will be spread by the media and cause harm to the local community, the project and the environment (Wilson, 2009:273).

In the light of the above, it becomes increasingly important that collaborative activities and partnerships are explored in order to provide innovative ways to manage tourist trends, patterns and commercial tourism volumes (Wilson *et al.*, 2009). A collaborative approach is used for pooling resources and the time and energy to achieve a common goal. A private-public partnership is a form of commercial 'innovation' that is enforced in an age of 'neoliberal thinking' that encourages the efficiency and effectiveness of achieving more with less (Wilson *et al.*, 2009:270). The PPP model provides a means of generating additional funding apart from sole dependency on government as a resource. The concept of partnership is encouraged as it takes on the notion of shared risk and responsibility in respect of commercial tourism activities as well as additional non-core and complementary services, such as catering, transportation and accommodation

services (Muganda *et al.*, 2013; Wilson *et al.*, 2009). Although risk becomes shared, it also comes at a cost as each stakeholder retains its own core interests and priorities.

2.7 COMMUNITY-BASED TOURISM

One of the first scholars of community-based tourism, P. Murphy (1983, 1985), analysed the relationship between the tourism sector and its impact on local communities. This is supported by scholars such as Prentice (1993) and Simmons (1994) who agreed that tourism and local community development should be based on the activities of tourists, communication between tourists and the local community, the size of the geographical area and the life cycle of the tourism product. Community based tourism is being developed across the world, making new and unique products possible and creating employment and income for local communities (López-Guzmán, Borges & Hernandez-Merino, 2013). Tourism developers are encouraged to create a sense of unity and actively participate in tourism activities as they are critical factors in the successful development of tourism (Aref, 2011:20).

Community-based tourism (CBT) is defined as “... tourism owned and/or managed by communities and intended to deliver wider community benefits that benefit a wider group than those employed in the initiative” (López-Guzmán *et al.*, 2013). Saarinen (2010:716) states that participation of the local communities is crucial and by gaining ‘similar levels of understanding and knowledge’ to that of other affected stakeholders, they will be enabled to contribute to the sustainable tourism development process. If local communities actively participate in decision-making, it could result in a thriving growing community and destination development (Akyeampong, 2011).

Although tourism in rural and developing areas provides both direct and indirect benefits for the poor, a number of obstacles stand in the way of realising the goal of growing community and destination development. The obstacles include diseases such as malaria, poor and unreliable infrastructure, a lack of choice of accommodation, marketing support, seasonality in respect of demand, limited accessibility to services, a lack of

training and hindrances with regards to policy making and governance (Mitchell & Faal, 2007).

A sustainable community is one that has experienced integration of the social, economic and physical characteristics of the entire region. It is where the local community has a sense of belonging and shows commitment to the improvement of their collective long-term well-being. It has been mentioned that sustainable communities embrace the concept of good governance and also accept ownership and the concept of self-reliance (SDG 3) (Chan & Bhatta, 2013; Espiner *et al.*, 2017). The socio-cultural aspect refers to self-sustainability. It affects equality, social capital and an improved quality of life by ensuring stable and profitable production activities (Chin *et al.*, 2016; Valdivia & Barbieri, 2014). The approach is cohesive, and attempts to go beyond traditional definitions and approaches concerning poverty eradication and viable rural livelihoods. This is described, as follows, by the leading champion and seminal author, Ian Scoones (in Krantz, 2001), of the sustainable livelihoods approach: “A livelihood comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base”.

The sustainable livelihoods approach realises that even though economic growth may be important for poverty alleviation, it does not automatically improve the capabilities of the poor to take complete ownership of the expanding economic opportunities. In addition, poverty does not only mean a lack of income but also relates to poor health services, illiteracy, a lack of social services and insufficient bulk infrastructure over and above the general vulnerability and powerless emotions with which local communities are faced (SDG 8). Thus, the sustainable livelihoods approach identifies social and economic issues requiring strong interventions that could be implemented to address these issues within rural development context (Krantz, 2001). At times, the economic benefits do not reach the entire community through job creation (Saarinen, 2010). However, through aggressive interactions it can lead to the transfer of modern skills and expertise, thereby breaking social isolation and the socio-economic predicaments faced by rural

communities (Ingle, 2010b; Gottschalk, 2012). Entrepreneurial competence is considered to expand the carrying capacity of communities that is required for tourism development (Chan & Bhatta, 2013; Laitamaki *et al.*, 2016). The reason why it is important to sustainably develop tourism in rural areas is because:

- it increases the participation of local communities in the development process;
- it brings wider benefits to rural areas;
- infrastructure is improved;
- crafts, customs and cultural identities are revitalised;
- social contact and exchange offer increased entrepreneurial opportunities;
- the natural and built environment are preserved and conserved; and
- rural priorities are increasingly being recognised by decision-makers and economic planners as important for potential tourism destinations (Okech *et al.*, 2012:42). This is linked to SDG 9, which places emphasis on sustainable human settlements.

2.7.1 Community Participation

Community participation has, at its core, the concept of 'people-centeredness' as an established practise in tourism development (Briedenhann & Wickens, 2004:75). Capacity building through community participation is at the heart of rural development, as it provides economic benefits from tourism, with the aim of uplifting rural communities (Briedenhann & Wickens, 2004; Drammeh, 2015). Coordination amongst the various people, groups and communities affected is important so that when problems arise, for example, competing ideas, they are handled with sensitivity to eliminate further negative impacts, such as cultural exploitation.

Community participation supports the local culture, tradition, knowledge and skills, which, in turn enriches the tourism offering and provides feelings of pride in the community's heritage, all of which tourists come to see and experience (Muganda *et al.*, 2013:53). It also increases people's sense of control over issues that affect their lives and promotes self-confidence and self-awareness. It should entail a form of democracy that gives the local community an opportunity to become an active participant in destination

development projects and the related decision-making processes. The goal of community participation is to improve communication and relationships between stakeholders in order to facilitate better decision-making and sustainable development (Aref, 2011:21).

Community participation is recognised as a significant element in implementing long-term effective strategies (Haukeland, 2011:139-40; Manwa *et al.*, 2017). This approach towards community participation contributes to the growth of the community's carrying capacity. It is about the sharing of knowledge and the process of learning in "... service of people's self-development" (Chin *et al.*, 2016; Okazaki, 2008:511). The purpose of participation is the redistribution of power and enabling communities to obtain a fair share of the benefits and costs. Gray (in Okazaki, 2008:512), another scholar, stressed that local communities need to be equipped with the appropriate skills and resources, which still remains one of the best approaches for sustainable development due to the following circumstances:

- a) The tourists are in harmony with the local community and a healthy social climate is established;
- b) The assets of the local community, including the culture of the residents, the natural environment, the infrastructure and events and festivals, are all being improved in cooperation with all the stakeholders; and
- c) The public sector is the driving force for development and has the support of the community as a priority at all times (Okazaki, 2008:512).

Local entrepreneurs and locally owned businesses are a good indication of the success of CBT as locals are equated with longer term self-sustainability and survival. In addition, Drammeh (2015) states that indigenous knowledge is crucial for tourism development and has the potential to contribute to economic activities in developing countries, thereby creating direct employment in the tourism industry and escalate local industrial development. The model of CBT suggested by Arnstein (1969) and Selin and Chavez (1995) presented a critique regarding the actual participation level of local communities (Aref, 2011; Okazaki, 2008). The model indicates that the participation process is divided into three levels, namely, non-participation, degrees of tokenism and degrees of citizen

power, all of which are necessary steps in the decision-making process (Okazaki, 2008). Each level is then further divided into eight stages comprising of manipulation, therapy, consultation, placation, partnership, delegated power and citizen control. It is also important to realise that every community is unique and that the steps in the model presented by Okazaki (2008) may not be applicable to all situations.

Community participation has also been criticised on grounds that it is not rooted in reality and that barriers exist in terms of its implementation. These barriers include insufficient financial assistance, a lack of education, business inexperience, high transactional costs and a conflict of interests. The participatory theory can also be time-consuming (Haukeland, 2011; Okazaki, 2008). If certain measures are not considered to ensure that the principles of community participation are implemented, it may lead to a tainted relationship between the developers and locals. It is, therefore, advisable that the community be given a legal stake in the investment so that they can be active stakeholders instead of passive recipients. This course of action would also be advantageous in enhancing the voice of local tourism suppliers at policy level, by establishing an organisation or association and facilitating participatory planning processes at local level. All of these measures might not be explicit but they hold the potential of increasing the involvement of local communities and encouraging their engagement with the government, private sector and tourists (Ashley & Roe, 2002). A more explicit approach would be a legal partnership between a private company and the respective local communities. Arrangements can be made between a community providing a certain service and an identified tour operator who provides clients with a service. Government can also take action to encourage private operators to establish local networks through planning or the delegation of tenure rights over assets. Ideally, local communities should function as an organised community, negotiating, entering legal partnerships, running enterprises and receiving dividends (Ashley & Roe, 2002). Ashley and Roe (2002) also indicate that it is as important to protect the local culture as it is to protect the natural environment. This is ideal when the process is driven by local communities and portrays some form of ownership and control by them.

The tourism industry is heavily reliant on the hospitality of the hosts and their interaction with the tourists, making their participation in the system and involvement in decision-making indispensable (Cole, 2006). Although the notion of community participation is recognised, there are times when many local communities do not trust the participatory process (Briedenhann & Wickens, 2004). This mistrust, together with the proactive activities of entrepreneurs who assumedly grab opportunities, creates an environment filled with power struggles, inter-tribal disputes and jealousy, all of which pose challenges for the traditional leaders and development entrepreneurs.

Challenges also occur when the local community has limited human resource experience and does not have the necessary financial resources to support their initiatives, in addition to the possibility that conflict exists between the various branches of local government. This leaves the community vulnerable and reliant on other stakeholders. CBT planning and policymaking consists of multiple stakeholders interacting and managing the power struggles, uneven allocation of limited resources and information sharing. Further conflict is also managed by the various stakeholders working collectively to find a solution to these challenges (Dredge, 2006).

It is argued that the future of rural tourism is not only dependent on the integration of local economic sectors and development goals, but also with the inclusion of the local community in identifying the type and scale of rural tourism that takes place in their locality (Briedenhann & Wickens, 2004). The purest form of rural tourism is envisioned through locally owned and controlled tourism projects. It is also proposed that a network of rural tourism providers is established to organise a collaborative effort in offering a wide range of activities (Briedenhann & Wickens, 2004:192). There is also a need for skills development and training in the tourism and hospitality sector to transform the human resource capacity (Grefe, 1994:34; Trejos & Chiang, 2009:374). Tourism education is another dimension where government can intervene to improve the skills base of poor communities by means of various training and educational programmes. As tourism activities continue to grow, so does the demand for training and education (Van Sittert, 2002).

2.7.2 A Pro-Poor Tourism Approach

In the 1950s, tourism was viewed as a strategy to assist developing countries with foreign exchange. Then, in the 1970s and 1980s, social scientists argued that poor communities and non-Western countries were usually excluded from receiving the benefits of tourism. In the 1990s, there was a deliberate reversal of this thinking that coincided with the development of the tourism industry where much more attention was being paid to poverty alleviation, in line with SGD No. 1, which reads: “End poverty in all its forms everywhere” (Scheyvens, 2007). Views regarding the relationship between poverty and tourism continue to vary. Nevertheless, it is important to recognise that poverty is unevenly distributed and communities do not necessarily represent cohesive social units within the respective regions (Krantz, 2001). In every community, there are those who are either worse or better off than others, leading to a situation that complicates the means whereby the impact of the Pro-Poor approach can be measured.

The term Pro-Poor Tourism (PPT) was first used in the literature in 1999 by Deloitte and Touche where it was recommended that tourism become an active instrument to alleviate poverty. Tourism initiatives aim to benefit the poor by strengthening local supply chains, including the informal sector, as well as leading community-based initiatives (UNWTO 2013). Mitchell and Faal (2007:446); Rogerson (2006:43); Torres and Momsen (2006:296); Ashley and Roe (2002:62) and Mograbi and Rogerson (2007:86) define PPT as tourism that “... net benefits poor people and seeks to ensure that tourism growth contributes to poverty reduction”. PPT and sustainable tourism form a central part of rural tourism development (Rural Tourism Strategy, 2012). PPT benefits may be in an economic, social, environmental or cultural form, all of which have a positive effect on livelihoods in various ways and reap the benefits of globalisation (Scheyvens, 2007; Torres & Momsen, 2006). Tourism is labour-intensive, suitable for rural and developing areas, includes women and the informal sector and is based on the natural and cultural assets of the poor (Akyeampong, 2011; Ashley & Roe, 2002). As in the case of sustainable tourism, PPT is also an approach, rather than a specific product that uses the

local economic development initiative to synergise growth with reorganisation to stimulate various opportunities (Rogerson, 2006).

The UNWTO endorsed the Millennium Development Goals (MDG) and claims that tourism contributes to fight the “... war on poverty” (Scheyvens, 2007:234). “For poor countries and small island states, tourism is the leading export, the only sustainable growth sector in their economies and a promoter of many related sectors. It plays a key role in the overall achievement of the Millennium Development Goals by 2015” (Scheyvens, 2007:233; World Tourism Organisation, 2005). The UNWTO identified seven different ways to address poverty through tourism:

- a) Employment of the poor in tourism enterprises;
- b) Supply of goods and services to tourism enterprises by the poor or by enterprises employing the poor;
- c) Direct sales of goods and services to visitors by the poor, that is, the informal economy;
- d) Establishment and running of tourism enterprises by the poor;
- e) Tax or levy on tourism income or profits with proceeds benefiting the poor;
- f) Voluntary support by tourism enterprises and tourists; and
- g) Investment in infrastructure stimulated by tourism that also benefits the poor in the locality, either directly or through support to other sectors (Scheyvens, 2007:244).

The Pro-Poor approach not only focuses on the tourist destination, but also facilitates good practices relevant to the eradication of poverty (Hill *et al.*, 2006). Research has shown that PPT interventions based on nature tourism projects are strongly linked to community ownership together with participation in the decision making process (Mbaiwa & Stronza, 2010; Simpson, 2007; Visser & Rogerson, 2004; Walple & Thouless, 2005). In tourism development, community involvement has become an ideology in the tourism planning process. Involvement of the community should begin at the initial decision making stage, before any commitments are made (Choi & Sirakaya, 2006; Haukeland, 2011). However, currently, communities are consulted infrequently, at formal public meetings, close to the end of the process. In other instances, local communities are only

advised about developments and rarely understand their role (Chan & Bhatta, 2013). Ideally, local communities should have an opportunity to be actively involved and act as an organised body in negotiations, entering legal partnerships, running enterprises and receiving dividends (Ashley & Roe, 2002). Ashley and Roe (2002) indicate that it is as important to protect the local culture as it is to protect the natural environment. This is ideal when the process is driven by local communities as it portrays a form of ownership and control. Furthermore, economic benefits from tourism can be in the form of a collective income from leases, equity stakes and levies. This is especially true, in the South African context, where tourism is developed on land held under some form of communal tenure (Ashley & Roe, 2002; Scheyvens, 2007).

Currently, developers usually over-sell the impact of development initiatives and leave the community with very high expectations, while the enterprises receive a maximum share of the tourism revenue, with members of the community gaining only a few economic benefits. Once expectations are not met as a result of the low levels of employment on offer and they have not become economic beneficiaries, as expected, psychological imbalances occur. Slowly, the community's attitude starts to change from one of initial excitement, to becoming very cautious and estranged (Eusébio, *et al.*, 2014; Choi & Sirakaya, 2006; Tao & Fuying, 2009).

Despite contesting theories concerning the Pro-Poor approach and its effectiveness, it is still important to ensure that the needs of local communities are considered in all developmental projects. The local communities, as stated before, play a big part in the success of any initiative as their emotions can either be beneficial or detrimental to the success of any development. In the South African context, as a developing state, local communities are not backward in demonstrating their discontent and this could have a negative impact on development initiatives. Therefore, developers should engage with the communities, even although the process is not as simple and easy as theory indicates.

2.8 CONCLUSION

Not all tourism projects can become sustainable, because sustainability is an approach that seeks to bring about a range of lasting benefits for the poor (Ashley, Goodwin & Roe, 2001; Mograb & Rogerson, 2007). Sustainable rural tourism does not predominantly aim to expand the size of the sector, but rather to unlock socio-economic opportunities for rural communities (Scheyvens, 2007). This is a domain in which some initiatives fall short.

This chapter now concludes the discussion on sustainability, in the context of rural development and the most appropriate aspects thereof, namely, local economic development, a collaborative stakeholder approach and community-based tourism in relation to community participation and the Pro-Poor approach.

CHAPTER 3: TOURISM ROUTES AND NICHE MARKETS

3.1 INTRODUCTION

The history of travelling by following routes, started as part of trading systems and religious pilgrimages. As a result of increased demand, the construction of roads became a great enabler for travelling. As time passed, the invention of motor vehicles and motor coaches increased the stress of travelling and roads were built for reasons other than tourism and recreation (Flognfeldt, 2005). Route tourism is a market driven approach for tourism destination development. The concept of route tourism differs across various parts of the world and some terminology such as 'themed routes', 'trails', and 'scenic-by-ways' is being used globally (Rogerson, 2007). Trails usually apply to short distances, where tourists can experience the attractions either on foot, bicycle or horseback. The concept of route development is known particularly for its substantial involvement with local communities as well as economic, environmental and cultural conservation activities. Successful route developments spread economic benefits geographically by developing tourist attractions and services such as restaurants and shops along themed tourism routes, which potentially leads to a longer length of stay and an increased spend by tourists. These routes provide additional employment and income for local communities to operate tour packages as well as a greater destination awareness brought about by increased aggressive marketing initiatives (Snowball & Courtney, 2010).

This chapter discusses tourism routes that are especially, niche market-based. The chapter starts by discussing the rationale underpinning tourism routes in rural areas together with its most familiar feature, drive tourism. Tourism routes are observed more specifically within the context of developing countries. Furthermore, tourism routes are perceived to serve as a vehicle to develop a sustainable tourism destination with emphasis on a particular tourism niche product. It is important to observe the tools and success factors that ensure the successful implementation of these tourism products.

3.2 TOURISM ROUTE DEVELOPMENT

The rural economy has changed in character for two primary reasons. The first reason is because of the depopulation which has occurred in rural areas and the transformation that has taken place in the marketing system of crop production, in terms of the accelerating rate industrialisation of agriculture. The second reason is neo-localism, which is defined as the strong desire of local communities to re-embrace the authenticity and uniqueness of their region (Ramsey & Everitt, 2007). Over the past years, tourism routes have gained momentum in attracting tourists to certain attractions and destinations. The crucial purpose of themed route based tourism is to ensure that all products and services are connected and possibly cause visitors to spend more and stay longer at a destination (Hashemi & Jusoh, 2015; Ramsey & Everitt, 2007). Tourism route development is complicated but must be led by policy, proper planning and effective management for the route to have positive impacts on local communities, the environment and its economy.

Emerging LED strategies are related to the development of route tourism in rural areas. Due to the remote and spatial nature of rural areas, route tourism has the ability, by functioning as an anchor, to market tourism offerings collectively in order for the destination to compete more effectively with larger and more established tourism destinations (Visser & Rogerson, 2004). Rural tourism routes also contribute to the relief of poverty through the creation of job opportunities for the unskilled, youth, women and small businesses, and relates the injunction stipulated by SDG 5 (Rogerson, 2006). The success and sustainability of rural route tourism is dependent on how well private businesses promote the route and the developing role of the public sector. The public sector facilitates tourism through the development and marketing of the route by providing infrastructure, upgrading the roads and signage, establishing well-functioning tourism offices, developing the area, supporting and maintaining public and community owned tourism resources, facilitating a unified marketing and branding strategy for the route as well as treating the route as part of the entire destination's tourism offering but not as a competitor (McLaren & Heath, 2012).

Route-based tourism demands that communities and interested stakeholders work together to market a regional theme, as they know that their attractions are small-scale and are a vast distance from cities and major markets (Ramsey & Everitt, 2007). According to Atkinson (2008: xx); Bialostocka (2013:2); Greffe (1994:23); Lourens (2007:475); Meyer (2004:3); and Viljoen *et al.*, (2010:68) tourism routes are defined as “... an initiative to bring together a variety of activities and attractions under a unified theme and thus stimulate entrepreneurial opportunity through the development of ancillary products and services”. Tourism routes attract visitors away from the usual tourism nodes to rural and small town areas. This mechanism is a great way for towns to develop partnerships and foster co-operation, instead of competing with one another (Donaldson, 2007; Meyer, 2004; McLaren & Heath, 2012; Rogerson, 2007; Stoddart & Rogerson, 2009). Furthermore, a synergised approach will strengthen regional ties and allow for a greater spread of the visitor’s spend and bed nights (Hashemi & Jusoh, 2015).

A study conducted by the University of Zululand (2012) restated the reasons for developing tourism routes (Chantamool *et al.*, 2015; Laws, 1995; Lourens, 2007; Marques & Santos, 2014). These reasons are indicated in Table 4 below, which also highlight the reasons for the development of tourism routes.

Table 4: Reasons for developing tourism routes

CATEGORY	REASONS
Economic	<ul style="list-style-type: none"> • Employment • Foreign exchange • Boost to other sectors
Social	<ul style="list-style-type: none"> • Cross-cultural exchange • Stimulation of new attitudes
Development	<ul style="list-style-type: none"> • Infrastructure • Recreational facilities
Sense of national pride or identity	<ul style="list-style-type: none"> • Modernisation • Traditional culture
Support for conservation	<ul style="list-style-type: none"> • Environmental • Ecological • Cultural

Source: Laws (1995)

Potential negative impacts relating to the development of a tourism route should be considered in relation to the economic, environmental and social aspects of tourism product development. Elements that can deter the development process are a lack of skills, inexperience and misuse of human and natural resources as well as an absence of research pertaining to best practice in route tourism, all of which lead to poor and unsustainable development (University of Zululand, 2012). Interest in the development of tourism routes, as the main vehicle for tourism industry growth, is increasing. Various tourism routes are being established and planned in developing countries, especially in South Africa, Lesotho, Mozambique, Namibia and Swaziland. Some of these tourism routes are cross-boundary routes that link several countries. Route tourism planning even stretches to the Indian Ocean Island of Reunion where the spice route links attractions and producers associated with the spice theme to the slave routes in West Africa (Stoddart & Rogerson, 2009).

The African route tourism initiative of the African Dream Project was organised by Open Africa. The African Dream Project developed tourism routes across Africa under the umbrella concept of Afrikatourism. Afrikatourism is the term used to market the concept of tourism routes and projects with a noticeably and exclusively African appeal. Their mission is "... to turn Africa's natural and cultural resources into one of the most valuable products on Earth, based on the business principle of supply and demand, which dictates that whatever is rare is valuable" (Meyer, 2004:7). Open Africa also has a vision "... to link the splendours of Africa in a continuous network of Afrikatourism routes, from Cape to Cairo" (Briedenhann & Wickens, 2004:73; Meyer, 2004:7). In 2002, the African Dream Project had 32 routes, covering 11623 kilometres across five countries, 80 participative towns and 791 establishments. This project had 5798 direct full-time jobs in season and 2344 part-time out of season jobs. Team Africa, which is the project driver, has 2331 individual, corporate, institutional, professional and partner members (Biggs & Purnell, 2003). In 2017, Open Africa had 58 routes in six (6) different African countries, with 2670 participating businesses providing a total of 28 490 jobs (Open Africa online). South Africa represents the highest number of tourism route initiatives on the African continent. Open Africa has been actively developing tourism routes embodying the key notion of pro-poor impacts. This NGO is known to support communities and establish links between

emerging entrepreneurs and small businesses. Open Africa obtains donor funds to launch new route initiatives that include four main components, namely, stakeholder meetings, workshops and data gathering, route aftercare and networking and the marketing and branding of the tourism routes. The four components of the route methodology and the steps followed by Open Africa entails setting the parameters of the route, identifying the key towns and attractions, facilitating workshops in the various towns and then launching the route at a formal function and lastly, monitoring and evaluating the tourism routes according to the economic, social and environmental indicators as reflected in the 'triple bottom line' principle (Viljoen *et al.*, 2010).

Open Africa noted that the most critical part of implementing their route development methodology was the buy-in from local communities. The routes will eventually be managed by the residents or a stable institution, such as the local municipality or local tourism association, as tourism will only be able to sustain itself in areas where local communities are willing and active participants (Viljoen *et al.*, 2010). Open Africa, with its extensive experience in route development, recorded a number of challenges that need to be overcome if route development is to be successful.

The first challenge is the fact that diversity exists in terms of social status and unequal power relations amongst the various key stakeholders as businesses range from the very well established to the struggling emerging entrepreneur at the roadside. The second challenge relates to the number of illiterate people and the lack of skills found in poor communities. For this reason, the poor find it difficult to participate and become part of the decision making process. Thirdly, the poor often do not understand the value of tourism and tourists' behaviour in relation to their own interests. Without local community input and buy-in, the establishment of tourism routes becomes very difficult (Viljoen *et al.*, 2010). Lastly, language barriers and vast distances remain a huge challenge (Atkinson 2009). Local communities in the rural areas are not comfortable communicating in English and this hinders overall interaction and cooperation. Geographical distance in rural areas is also a challenge as routes are taxing in terms of time and effort, especially, today, where people are leading demanding and busy lives (Viljoen *et al.*, 2010).

In order to overcome the challenges of the route, it is necessary to include all the main players, appoint an active chairperson representing the route, effectively market the route, obtain in-depth knowledge about the route offerings of other participants, continually communicate with all the partners, erect proper route signage, embrace disadvantaged communities and mobilise their members. Route stakeholders should collectively identify their main attractions, the route name and branding thereof (McLaren & Heath, 2012).

The South African government perceives niche markets as a unique leverage to inclusively develop a destination. Micro-enterprise development is vital for pro-poor as SMME development is encouraged, thereby adding value to existing routes and creating new business opportunities (Snowball & Courtney, 2010). Many tourists are well-informed and familiar with a destination and arrive with clear expectations, while the local communities know very little about the tourists and are unaware of their expectations (Zoomers, 2008). According to Stoddart and Rogerson (2009), the HSRC suggests that a tourism route is an imperative catalyst for community-based local economic development, especially for poorer communities in remote rural areas. According to Meyer (2004), tourism routes can provide the following benefits to a destination:

- Wide-spread economic benefits to the community through the development of tourist facilities and services, such as restaurants, arts and crafts stands and curio shops, along the route that encourage tourists to stop at these points and buy the products;
- Additional employment and income can be provided through the provision of local products and services, both directly and indirectly, within the tourism value chain, such as transportation, accommodation, attractions and activities;
- Enlarging the target markets and extending the average length of stay of visitors by providing a variety of experiences and activities throughout the tourism route.

Briedenhahn and Wiekens (2004:72) and Lourens (2007) mention that tourism route development is a "... vehicle for the stimulation of economic development through tourism. The challenge facing the developers of themed tourism routes is their need to understand the needs of the relevant niche market. The future of the route is dependent on understanding the limits to which the market can consume a particular product. In order

to remain a viable tourism destination, the tourism route should not over- or under-supply its offerings (Olsen, 2003). Additional challenges facing developers are a poor conceptualisation of land-use planning and the formulation of regional strategic development plans, without having any clarity about the role played by traditional leaders versus that of elected officials. In order for a tourism route to be sustainable, the planning thereof should be linked to regional, provincial and national tourism plans. For this very reason, the Tourism Act No. 3 of 2014 emphasises the importance of the geographical spread of tourism beneficiation, especially in the rural and peripheral areas of the country (Snowball & Courtney, 2010).

Tourism theorists suggest that plans for a route should have a bottom-up approach that stems from the grass roots, so that it can be promoted and supported by the local and provincial government (Sharpley & Telfer, 2002). Local communities are also more likely to protect, conserve and manage their culture, traditions, heritage and resources in their local areas. 'Place-making' in the hands of the local community, makes more sense as they have the most knowledge and understanding of the environment (Ramsey & Everitt 2007:106). However, the reality is that inputs from local communities are hardly ever taken into account and the themed tourism route development process still remains a top-down approach. On a practical level, the inputs of community members are rarely considered as they are perceived to be either irrelevant or unrealistic, thereby, undermining any chance of the community understanding the potential benefits of a themed tourism route.

3.3 DRIVE TOURISM

Route tourism is primarily focused on self-drive tourists, exploring the route and its offerings at their own pace (McLaren & Heath, 2007). Drive tourism is recognised as a significant market as it holds the potential to stimulate growth in regional and rural areas, spreading the economic benefits of tourism to more than one community (Meng & Hudson, 2012; Olsen, 2003; Prideaux, Wei & Ruys, 2001). This growth is a common trend developed in various nations and is based on the mobility that cars bring. It depends on numerous product markets offering a range of benefits to a range of different people

(Prideaux *et al.*, 2001; Sivijs, 2003). It also enables and rotates tourist spend on tourism services in multiple destinations, whether it be in different towns or countries (Hardy, 2003). The fundamental components in the drive tourism framework are the spatial relationships between the origin and end destination, along with necessary infrastructures, attractions and marketing activations. The demand for drive tourism depends mostly on the area's ability to supply the required infrastructure and services as well as the preservation of the landscape and other key attractions (Meng & Hudson, 2012).

Drive tourism is an important aspect associated with tourism route developments and is defined as "... travelling away from home for at least one night, on holiday or visiting friends and relatives, in their own or a rented or borrowed vehicle as the primary mode of transport" (Rogerson, 2007:51). The Standards Australia 'Manual of Uniform Traffic Control Devices' acknowledges three levels of tourist ways and drives. Firstly, themed tourist ways that are of national, state or regional significance and secondly, tourist drives of regional or local significance and thirdly, short drives of local significance only (Olsen, 2003). According to Prideaux *et al.* (2001), the key elements of drive tourism include the following:

- the road and all of the associated activities required to build and maintain it;
- accommodation, which includes motels, farm stays, caravan parks, camping grounds, bed and breakfasts, self-catering units or apartments and hotels;
- refuelling facilities which supply petroleum, gas and diesel as well as food and, in some jurisdictions, alcoholic beverages;
- information, usually consisting of roadside signage, tourism information centres and brochures;
- enforcement of road rules and regulations by police;
- vehicle repairs and recovery;
- attractions that target highway travellers as their prime source of customers; and
- the promotion of on-road attractions" (Prideaux *et al.*, 2001:212).

3.3.1 Characteristics of Drive Tourists

Previous research has shown that the drive tourism market enjoys the freedom and independence provided by the experience. They prefer to be called travellers instead of tourists and enjoy the flexibility and the sense of freedom that gives them control over their leisure time. The drive market differs in the amount of time spent in planning prior to the journey, in the time travelled and in the choice of a route (Hardy, 2003; Olsen, 2003). There are many types of visitor segments in this market, for example, the day tripper without overnight stays, the overnight traveller, intrastate and interstate traveller and lastly the international traveller. Prideaux, Wei & Ruys (2001) found that participants in the drive tourism market range from young to senior travellers who constitute a crucial sector of the tourism industry. The majority of seniors who go on vacation by motor vehicle prefer not to travel during school holidays, thus implying that families with children go on self-drives during school holidays, which results in a great seasonal spread of visitors throughout the year (Prideaux *et al.*, 2001). The key characteristics of the drive market relating to independence and freedom means that flexibility has an impact on the length of the visitors' stay and their expenditure. These qualities provide economic beneficiation to regions which do not usually fall within the range of pre-packaged mass tours. Therefore, themed routes are developed to meet the needs of the drive tourism market.

Hardy (2003) introduces another segment into the categorisation of drive tourists. According to Hardy, there are three segments based on behaviour. The first segment is the touring segment that refers to those who 'meander' and stop off where they please; the second segment is the A to B segment with stops along the way, breaking the journey for only short periods of time and, lastly, the A to C segment who drive straight to their destination to enjoy a longer stay at their preferred destination. Hardy (2003) also maintains that not only can drive tourists be broken down into segments, but they can also be divided on grounds of their length of stay at a destination. Short breaks are between one to three (1-3) nights, short tours are between four to seven (4-7) nights, big tours are between eight and 21 (8-21) nights and grand tours are from 22 nights and longer. Meng and Hudson (2012) indicate that the drive market is not an easy market to accommodate and, therefore, it is imperative that the travel decision-making process

concerning potential drive tourists is carefully investigated. The potential market also needs to be studied in terms of the interests of tourists, possible barriers to success and their information sources before and during their trips.

Rogerson (2007:50) states that the "... tourism route concept is considered to be a very effective method of tourism distribution especially for tourists who travel by road either by driving, hiking or cycling". In many parts of the world, the concept of trails and heritage routes are used to promote tourism in small and rural areas. Routes are a noble way for the improvement of 'less mature areas' with great cultural resources (Rogerson 2007:50).

3.3.2 Route Infrastructure contribution to drive tourism

Tourism is an industry that encompasses many sectors and the model for tourism development identifies transportation as a main component of development plans for rural destinations (Atkinson, 2009; Gartner, 2005; Rogerson, 2016). Together with transportation, the quality and appealing nature of the transportation linkages between attractions and destinations add value to the destination. However, having mentioned this, the role of transport and road infrastructure improvements is generally neglected (Atkinson, 2009; Gartner, 2005; Greffe, 1994; Visser, 2016). Tourism is produced and consumed at the same time and because of the vast distance and nature of rural areas, the tourist must physically travel to where the product is located. This means that the transportation and infrastructure system of rural areas should be of such a quality that the journey to the product is also enjoyed (Gartner, 2005; Ruddy, Gössling, Scott & Hall, 2015).

Olsen (2003:337) suggests that "... trip planning, road safety and reassurance techniques employed in the projects should be reviewed in the future to assess the impact on regional communities and their ability to meet the objectives of road safety, network efficiency and regional development". Furthermore, Prideaux *et al.*, (2001) and McLaren and Heath (2012) emphasise the need to give careful consideration to the cost of road maintenance and properly branded route signage as well the high costs relating to the theft rate of fence poles.

Product development, infrastructure and accessibility are essential concepts for the design of a functional tourism route development strategy. The development strategy includes both infrastructure and 'suprastructure' elements (Kovács & Nagy, 2013:224). Infrastructure is fundamental to effective and efficient tourism at any destination, while the 'suprastructure' (or tourism value chain) is also important as it refers to circumstances surrounding the provision of the operational aspects of the industry, such as restaurants and accommodation. The tourism industry requires a combination of sufficient bulk infrastructure and human resource capacity (Kovács & Nagy, 2013). The routes leading to attractions in the countryside need to be chosen and designed impeccably and include basic infrastructures, such as signage, resting and ablution areas especially along long tourism routes.

Prideaux, Wei & Ruys (2001) emphasise that *en-route* facilities are essential for drive tourists as more time is allocated to the route, than to a specific destination. Research has also shown that important characteristics of a tourism driving route are directness, safety and security, the flow of traffic and the distance (Eby & Molnar, 2002). The investment required for the creation of tourism infrastructure, competes with the basic investment potential of local communities. Municipalities that lack basic infrastructure, have a much lower budget for tourism infrastructure (Snowball & Courtney, 2012).

3.3.3 Benchmark: Drive Tourism Project in Queensland, Australia

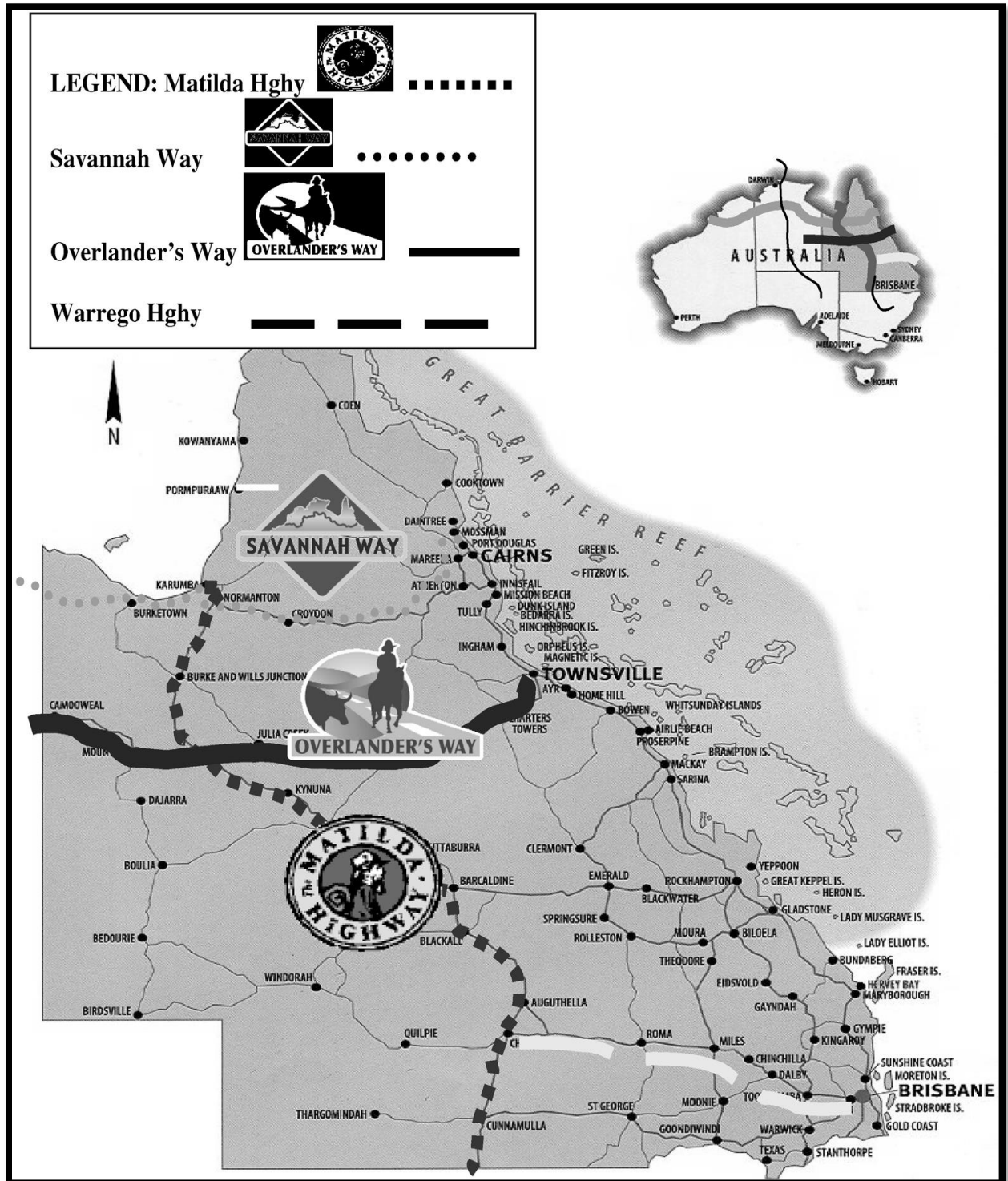
The Drive Tourism Project in Queensland, Australia is one example of a drive tourism project. This initiative is entirely funded by the Queensland government, which has a vision of enhancing the experience of the drive tourist and further stimulate regional and rural tourism growth still further (Sivijis, 2003:342). This programme is a partnership between the Department of Main Roads (DMR), Tourism Queensland (TQ) and the Queensland Heritage Trails Network (QHTN) of Arts Queensland. Drive tourism is primarily the core reason for the success of Queensland tourism development. Sivijis (2003) provides an overview of this project with a specific focus on the development of corridor management plans (CMPs). The CMPs have been developed to enable even better offerings for the drive market through the improvement of themed routes and

integrated information systems (Sivijs, 2003). Similar to Open Africa, the National Centre for Tourism (NCT) developed a method for successful themed route development (Hardy, 2003). The NCT suggests that basic visitor needs are critical when it comes to developing themed tourism routes as there should be a good reason to stop in a town or at an attraction. Features that entice visitors are adequate signage and good roads, safe access and supporting information, access to clean and convenient facilities and shelter as well as good quality visitor services. Lastly, local service staff should provide a warm and friendly welcome upon the tourists' arrival (Hardy, 2003). The QHTN is founded upon the following core principles:

- a) Conservation of heritage assets that deliver economic benefits to local communities;
- b) Best practice solutions to conservation, interpretation and presentation of the socio-cultural heritage, and adherence to environmentally sustainable design principles;
- c) Long-term partnerships between government, business and local communities, as the basis of a structure to support a sustainable ongoing cultural tourism and heritage management regime;
- d) Reflecting the diversity of the socio-cultural heritage, and embracing natural, indigenous and historic values;
- e) Supporting a sense of place within the local community and the landscape;
- f) Integration of the heritage into a regional identity, historical contexts and thematic linkages; and
- g) Community capacity building through active community involvement, ownership and understanding (Sivijs, 2003:345-6).

Figure 4 below illustrates the themed routes that are being developed as part of the Drive Tourism Project in Queensland.

Figure 4: Priority themed routes of the Drive Tourism Project, Queensland



Source: Sivijis (2003)

Furthermore, the Drive Tourism Project (DTP) has four objectives (Sivijs, 2003:346), namely:

- a) Provide a major stimulus to Queensland's regional and rural tourism industry;
- b) Establish a state-wide marketing framework and identity for road-based tourism across the state's strategic tourism routes;
- c) Promote the QHTN project sites and Queensland's heritage sites in general; and
- d) Enhance the experience of the motoring tourist throughout the state.

The DTP plays an integral part in the QHTN and provides other means of promoting the collective experience, including tourist signage. They collectively investigated the strategic tourism routes and identified priority road needs as a result of which ten themed routes were proposed. These tourism routes were promoted as a 'tourism-related driving experience' instead of a 'single destination' in conjunction with the tourism signage guidelines policy. Research has found in both Australia and the USA that tourism themed routes contribute to the regional and rural areas and brings about linkages between the regional destinations, sites and attractions (Sivijs, 2003).

The drive tourism market, which comprises of approximately 80% of travellers, is an important sector of the Queensland's tourism industry and contributes \$4.4 billion to the state's economy each year (Queensland Drive Tourism Strategy, 2012; Sivijs, 2003). The drive tourism market accounts for about 70% of the overnight leisure market. The importance of this market has been acknowledged by the respective destination marketing organisations (DMOs), local government and communities as well as the private sector. The framework that was developed encourages a community-based approach for themed routes and will develop, still further, to improve visitor infrastructure through collaborative approaches between the key stakeholders. The implementation of the DTP highlights the importance of regional development and most importantly, a pleasurable drive holiday experience (Sivijs, 2003).

The main challenge that Queensland is facing is to continually make sure that the tourism offerings are in line with the interest and desires of the consumer. Other challenges are the quality, safety and maintenance of the road, signage, roadside infrastructure,

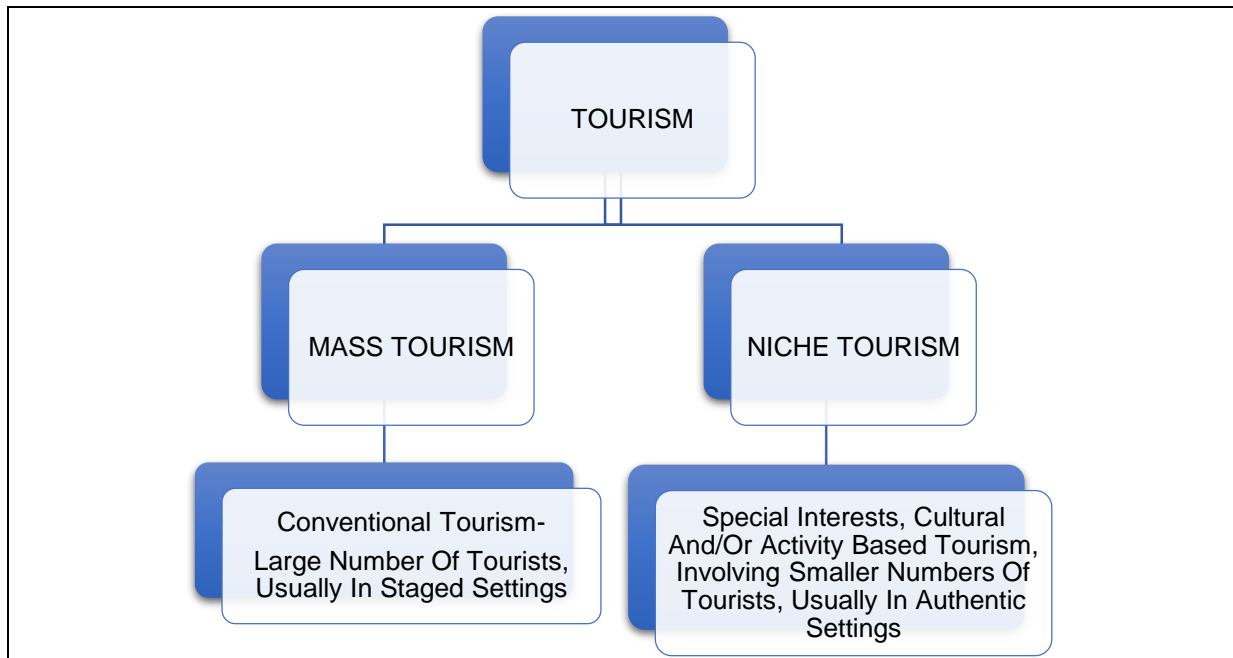
accommodation, visitor information and technology applications as well as marketing and promotional activities. A thematic discussion about the role of tourism routes in fostering regional development and integration at the UNWTO was held from the 4th to 6th June, 2014 where the importance of tourism routes was deliberated. It was stated that tourism routes can create opportunities for “trans-boundary collaboration, cohesive destination marketing, product development, public-private partnerships and preservation of the natural and cultural heritage” (UNWTO, 2014). It was mentioned later, that the sustainable development of tourism routes has gained momentum and is of increasing relevance, as it addresses the issue of seasonality while exploring new markets for travellers who seek to enrich their experiences with a more flexible travel itinerary and wish to learn about local people and their traditions.

It is important that an inventory is made of all the related products and services, whether developed or undeveloped, along the route. A skills audit relating to human capital is imperative, as this, together with the product offering, can be strengthened by being aware of the gaps in terms of the strengths, weaknesses, opportunities and threats on the route (Ramsey & Everitt, 2007; Viljoen *et al.*, 2010).

3.4 NICHE MARKET-BASED TOURISM ROUTES

Many scholars believe that mass tourism is non-locally orientated and destructive, while alternative or niche market tourism is more community-orientated, protective and has strong interactions with the local economy (Chan & Bhatta, 2013). Mass tourism is also perceived as a contrasting notion to that of sustainable tourism (Espiner *et al.*, 2017). Niche tourism, on the other hand, is unique and very much localised and location-specific (Boekstein & Tevera, 2012). Since the 1970's, the tourism industry has experienced profound changes that have forced tourism stakeholders to review and change their products and offerings in order to meet the requirements of the emerging target markets that are related to SDG 8, which is to: “ Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all” (Romina *et al.*, 2013, UNWTO, 2015).

Figure 5: Types of tourism



Source: Adapted from Boekstein and Tevera (2012)

Niche tourism initiatives are especially beneficial to disadvantaged communities because local economic development projects are able to make a contribution through:

- assisting with the diversification of the tourism economy by creating new markets;
- exploiting the potential for greater growth and influence than mass or mainstream tourism;
- higher yields per tourist in respect of foreign exchange earnings and consumer spending;
- stimulating the creation of work that requires specialised skills and knowledge as opposed to low and semi-skilled jobs as found in mass tourism;
- generating community-based activities that are usually in urban and traditional tourist areas, thereby contributing to the geographical distribution of the benefits of tourism; and
- increased local spending by attracting tourists (Boekstein & Tevera, 2012).

Niche tourism, also known as alternative or special interest tourism has a unique set of characteristics that sets it apart from mass 'packaged-tour' tourism (Sharpley & Telfer, 2002). The destination's product development is specifically designed and based on the needs and preferences of the entire tourist experience. The travel agent and the tour guide are forced to be knowledgeable as the tourists are well educated and informed and embark on this journey to learn new things (Belij & Tadic, 2015). For niche markets, a marketing and branding strategy is crucial and an invaluable intangible asset of a tourism destination or product. Every niche market differs significantly from product to product and in terms of experiences and expectations (Neven, 2014). Decisions about the right branding, for a particular niche market, are extremely important, as it influences whether or not significant growth occurs, thereby providing sustainable development. It is important that the branding strategy is aligned to the desired brand identity of the destination and dependent on market behaviours (Neven, 2014). Branding provides guidance as to how the market is positioned and how to address visitors' needs at the highest satisfaction level, focussing on growing business sales and product attractiveness. It holds the key to highly effective operational management with regards to the competition in order to guarantee survival in the market. Adjustment to market realities is necessary for an effective branding strategy in tourism. The market can be identified through their activities and the consistent interaction and feedback received from the market. The environment should be systematically assessed and analysed to ensure that it is flexible in space and time (Neven, 2014).

Tourism routes are predominantly market-driven approaches towards rural tourism destination development (Hashemi & Jusoh, 2015). Previous research studies have recommended the following requirements for the branding and marketing of a sustainable tourism route:

- A clear identified selling point;
- A clear brand identity;
- Professional mentorship and skills development programmes;
- Transparency in all decision making;

- Updates with regards to current tourism trends and patterns, particularly in the respective regions;
- Strategies that are developed and aligned with the support of the tourism authority;
- Continual re-evaluation of products and offerings;
- Effective transfer of essential skills and the fostering of tourism ambassadorships; and
- A good tourism product mix (Lourens, 2007; University of Zululand, 2012: 22).

In addition to the above the following steps have also been advised:

Step 1: Conduct on-going market research to conceptualise the route's target market and its requirements.

Step 2: Audit all existing resources and their level of service and quality.

Step 3: Evaluate tourism assets and identify unique selling attractions and products.

Step 4: Determine the size of the target market.

Step 5: Establish a clear brand identity.

Step 6: Develop a strategy and operational plan.

Step 7: Develop a sound financial plan (University of Zululand, 2012:23).

Niche market-based tourism routes, such as the Wine Route, Midlands Meander, Magalies Meander, Camino de Santiago, Astro-Chile Route and the EU Sky Route are discussed in the following section, in association with the relevant route maps. Tourism route maps are important marketing instruments in tourism development as they present an accurate image of the route for tourists (Eboy, 2017). Maps serve as a tourism destination guide that provide information about the destination's existence, location and the distance between key attractions as well communicating basic information about the attractions. These maps also contain the contact details of local Destination Marketing Organisations (DMOs) for further enquiries (Uluocha, 2018).

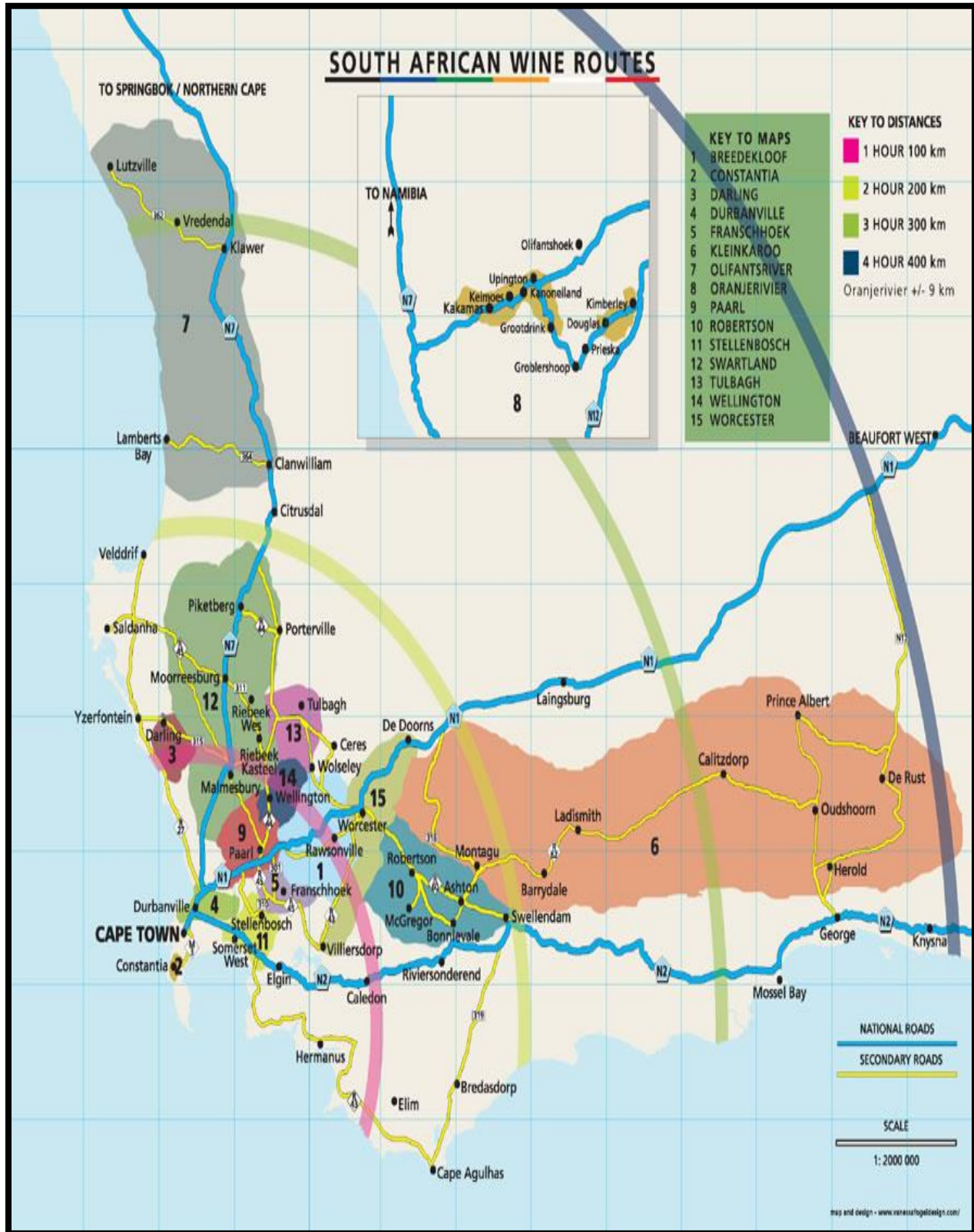
3.4.1 The Wine Route

The country's first tourism route dates from the 1970's with the establishment of the wine routes in the Cape Winelands (Stoddart & Rogerson, 2009). Italian legislation defines wine routes as "... tourist routes, marked and promoted by specific signposts, along natural, cultural and environment attractions, vineyards and wineries opened to visitors" (Giordano, Tubi, Salvatore & Chiodo, 2017:1). Wine routes represent a network of enterprises and a territorial marketing tool that is a collective initiative by both private and public role-players to attract new economic activities, sustainable development and a positive destination image (Giordano *et al.*, 2017). The notion of visiting vineyards has been in existence since Greek and Roman times. Since the 1920's, wine trails have formed a great part of the German tourism industry that includes the *Weinlehrpfad* (instructional wine path), which has been assisted by wine sales to the extent that by the 1970's, eleven wine regions have developed their own *Weinstraßen* (wine roads). Hungary, Portugal, France and other European countries have also started developing wine routes in regions where wine is produced. The main reason for these route developments is to improve the quality of wine products and services at the respective wineries (Bruwer, 2003). Wine tourism emerged in these regions due to increased accessibility, knowledge and the appeal of wine to the public (Nowers *et al.*, 2002).

The wine industry in South Africa is one of the oldest outside Europe, with the first vineyards being planted in the 1650's (Bruwer, 2003). The Western Cape Province in South Africa is famous for its natural and picturesque attractiveness that is supported by solid sustainable tourism infrastructures. The Western Cape wine route is a prime example of the development of local tourism and agricultural sectors with the goal of improving the general quality of life of communities through the establishment of a steady and lucrative agri-tourism sector (Nowers *et al.*, 2002). The various branches of the South African Wine routes are illustrated in Figure 6. The idea of job creation through agri-tourism was already conceptualised in early 1969 by one of the founder members during a visit to the *Route de Vins* at Morey St Denis in Burgundy, France (Nowers *et al.*, 2002). Since, 1971, the Stellenbosch Wine Route has grown into one the most iconic tourist attractions in the Western Cape. The province has eleven wine tours, linking all the wine

cellars and wine farms for a variety of activities, such as wine tasting. Wine tourism includes the visits to wine farms, wine cellars, wine festivals and wine shows for which grape wine tasting and/or experiencing the attributes of a grape wine region, are the prime motivational factors for visitors (Hall & Macionis, 1998; Viljoen & Tlabela, 2006).

Figure 6: South Africa Wine Routes



Source: <http://www.winesofsa.co.uk/visiting-sa/>

The success of the wine route has been achieved because three objectives are combined, namely, tourism, produce sales and product brand promotion. The wine route consists of other routes to complement existing routes, for example, the cheese and olive routes. Guesthouses, restaurants, coffee shops and pubs have all developed steadily, in and around Stellenbosch, since the inception of the wine route (Nowers *et al.*, 2002). The route continues to have a positive impact on regional and rural tourism as the selling of wine directly to tourists develops a wider range of marketing.

According to Bruwer (2003), it is crucial to develop a profile of the wine tourist, namely, the consumer to understand the wine tourism phenomenon. Demographics provide the basis for identifying the simple wine tourist market segment, but psychographic data, in respect of lifestyle, interests, attitudes and values, provide stronger and actionable research information about the way in which wine plays a role in the tourist's lifestyle. Lifestyle measurement is important for marketing and for the development of advertising and marketing strategies (Bruwer, 2003). The process of understanding the consumer is most applicable to Astro Tourism. The process of understanding the demographics and travel behaviour of the astro tourist will provide very specific strategies for tourism developers and tourism business owners to structure and package their offerings and services in respect of what is most suitable for special interest groups. Along with their tourism needs, determining how satisfied they are with the basic infrastructure of the destination will provide local government agencies with exact information concerning developmental prioritisation. Some routes do not have the co-operation of local municipalities, which negatively affects the value and importance of tourism in rural areas. Nowers, De Villiers and Myburgh (2002:203-4) conducted primary research by interviewing members of the wine routes about the development of guidelines and recommendations for new entrants to themed route development.

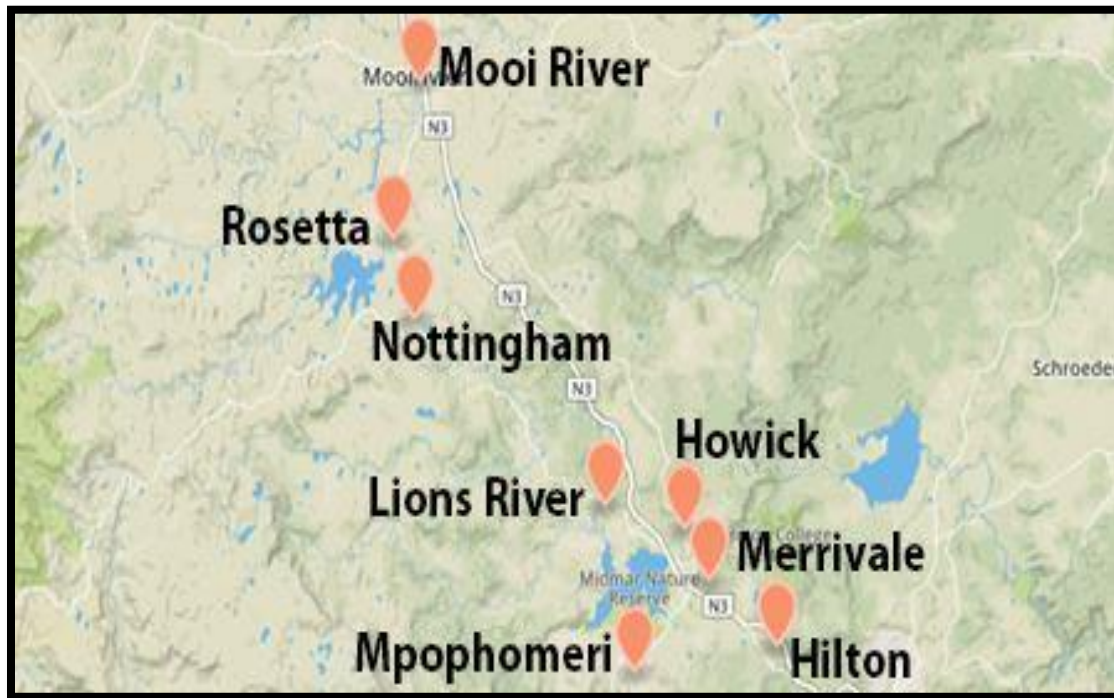
The Wine route, especially applied the requirements mentioned by Lourens (2007) and the University of Zululand (2012) and this can be adhered to and adapted to suit any other type of tourism route development (Nowers *et al.*, 2002). This is especially applicable to sustainable tourism development of the Astro Tourism product. A collective management approach is unquestionably necessary, if the route is to maintain its sustainability. This

approach can be in the form of a tourism association, where the local government, the local tourism businesses and the communities are all part of its development process.

3.4.2 Midlands Meander

The Midlands Meander is a tourism route in the KwaZulu-Natal Province where its geographic boundaries stretch from Hilton in the south to Mooi River in the north of the province. The Midlands Meander is one of South Africa's most successful routes, driven by the private sector and funded by a destination management organisation (DMO), the Midlands Meander Association. The route offers a range of arts and crafts and agricultural produce as well as beautiful rural scenic landscapes (Lourens, 2007). The route concept for the Midlands Meander was initiated in 1985 by five individuals from the local area. They wanted to draw more people to the KwaZulu-Natal Midlands by offering a joint marketing venture. By 1988, the Midlands Meander Association (MMA) consisted of 57 members. The Meander was consolidated in 1994 and at this stage the first colour brochure was designed and disseminated, publicising a total of 68 products. The MMA Executive Committee drives all tourism related activities in the area. Once the Committee realised that local communities were not benefitting, it actively put strategies in place to assist local black entrepreneurs to become members of the MMA (Lourens, 2007). The towns participating in the Midlands Meander are illustrated in Figure 7 below.

Figure 7: Towns participating in the Midlands Meander



Source: <http://www.tourismupdate.co.za/article/104086/Tourism-routes-by-theme>

The Midlands Meander has grown extensively since its inception in 1985 and has led to an increase in job and entrepreneurial opportunities. The area now offers a potential business and investment opportunity for the hospitality and accommodation sector. A very important success factor operating in the Midlands Meander is the quality assurance of its products and services. In addition to the South African Grading Council's criteria, the MMA developed very specific joint criteria for new products and it conducts regular inspections to ensure adherence to the local code of conduct. After fulfilling their initial aim of providing an attractive environment and products, the MMA implemented a further important success factor in that they restructured the management system and organised marketing and public relations campaigns (Lourens, 2007). The success of the Midlands Meander was predominantly due to seven steps that are referred to as the 'roadmap for development'. In the first place, the route required proper marketing research to identify the key target markets and their needs and preferences. Secondly, an audit needed to be done in order to identify the various tourism products. The association required a minimum standard from the members that was equal to or higher than the grading system.

Thirdly, the tourism assets needed to be investigated and the unique selling features identified. The fourth step was to determine the size of the membership base and develop specific portfolios for the committee members. Mentorship programmes needed to be incorporated into the management structure for the sustainability of skills. In fifth place, a clear and concise brand identity, which encompassed the entire association and tourism route, had to be developed. The sixth step was to determine a clear strategy stipulating day-to-day operations that were aligned with the vision and mission of the association. Lastly, a financial plan was put in place for resources to be allocated and prioritised (Lourens, 2007).

The above seven steps are very applicable to the Astro Tourism route development project. Market research identifying the niche market together with visitors' needs and preferences are important as these will determine the packaging of the tourism product. The audit refers to a situational analysis of the destination, which determines the tourism product offering for the region as a whole. Furthermore, the association will draw on the various affected stakeholders to serve as a structured mechanism to pull together both human and financial resources. These steps form important components of the proposed Astro Tourism development route framework.

3.4.3 Magaliesberg Meander

The Magaliesberg Route, established in 1998, is on the periphery of the Gauteng Province, in the local municipality of Mogale City, formerly known as Krugersdorp (Rogerson, 2007). The Mogale City development plan states that the "... rural areas provide the scenic beauty of the area, with areas like Magaliesberg hosting primarily tourist-orientated farming activities" (Rogerson, 2007:58-9). The Magaliesberg Meander is a non-profit organisation with the goal of establishing a common platform for the collaborative marketing and conservation of the respective areas as tourism destinations (Rogerson, 2007). Tourism featured in the LED strategy for the Mogale City municipality and has an important role to play in economic reformation with emphasis on the diversification of the local economic base, job creation and enterprise development. However, the full potential of the impact has been limited due to poor tourism planning

and shortfalls that occurred from within the respective local government bodies (Rogerson, 2007).

This region has the potential for great tourism development, especially as it is adjacent to the Cradle of Humankind World Heritage Site and the Sterkfontein caves. There is a need to raise an awareness of the potential benefits of tourism for rural communities. In the case of both the Midlands and Magalies Meanders, there is a desperate need to maximise the local impacts of the projects through local labour and local enterprises. These Meanders constitute locality-bound tourism and are predominantly driven by the private sector, as the planning responsibility from the public sector appears to be a secondary consideration. The associated businesses consist predominantly of white entrepreneurs and have a limited black empowerment base. There has been little effort to include local black communities in the development process and this has resulted in a tourism business environment of inequality (Rogerson, 2007). However, opportunities can be found in fields such as interpretative and directional tourism signage, the establishment of effective local tourism offices and the development of rural tourism routes as well as the establishment of ancillary services in towns (Briedenhann & Wickens, 2004).

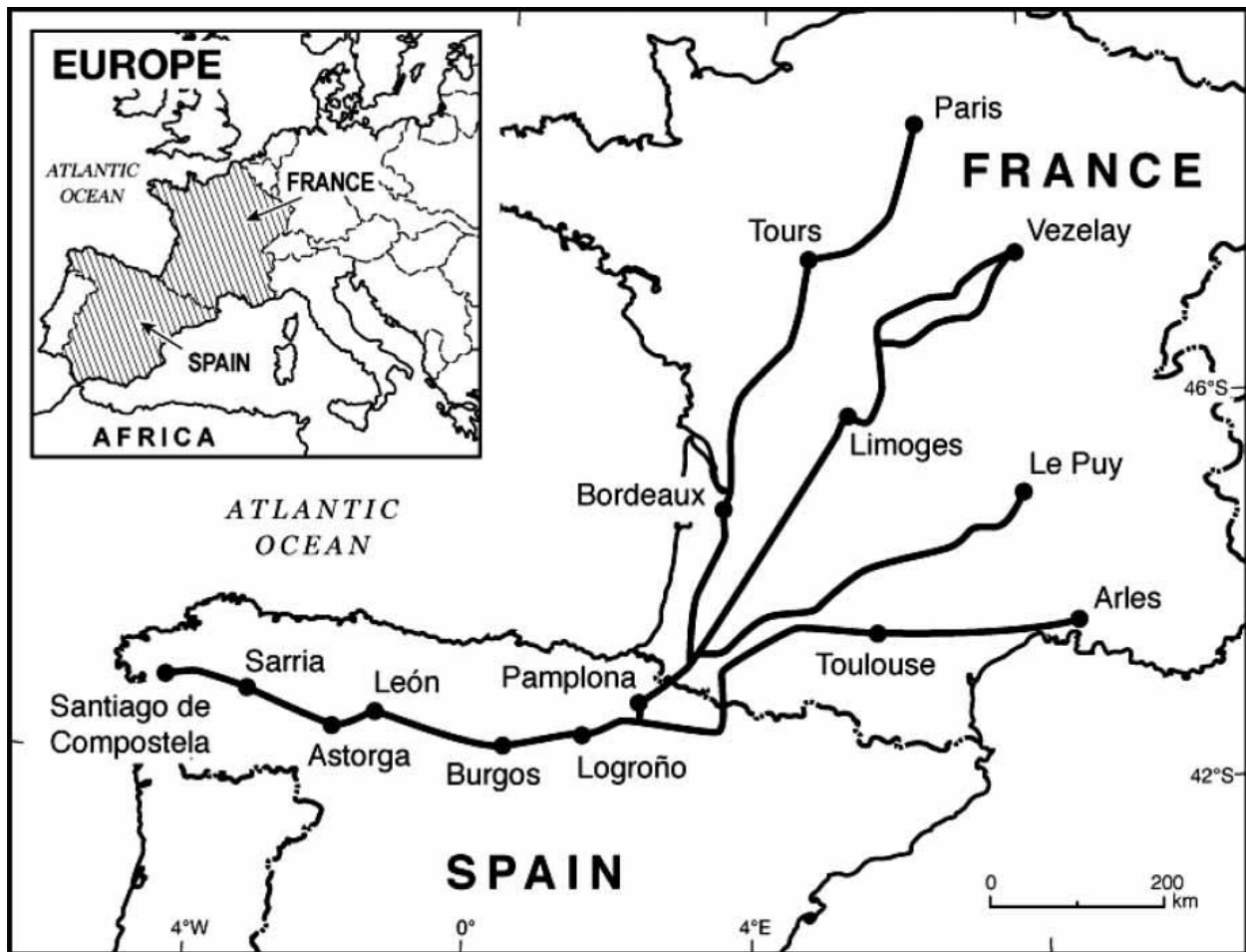
Local government does not usually recognise the value of tourism and, by so doing, drives the private sector into leading and delivering rural development. In order to be effective, it is important to avoid social, cultural and political disharmony that originates from competition or disarray. Leadership is very important in developing tourism routes and if the public sector does not fulfil its role, the private sector will step in. This is the point at which very poor linkages occur and few opportunities arise for Historically Disadvantaged Individuals (HDIs) to establish SMMEs (Meyer, 2004; McLaren & Heath, 2012).

3.4.4 Camino De Santiago

The Camino de Santiago is a pilgrimage route that is about 1000 years old. It stretches across Europe for about 700km in northern Spain and is approximately 2000km in total length when its four branches in France are incorporated. The route is destined for the Cathedral de Santiago de Compostela in Galicia, north-west Spain. This cathedral is believed to be the burial site of the apostle, St. James. The pilgrimage gained a great deal

of momentum and popularity in the 11th and 12th centuries when more than 500 000 people participated in this pilgrimage. In the 1980's, many people completed the route from Eastern Europe, Switzerland and Portugal, but only a few thousand arrived in Santiago (Briedenhann & Wickens, 2004). The Camino de Santiago is a route that can be experienced by walking or cycling the complete route, or by just by doing sections of the route to reach the final destination, that is, the city of Santiago. The most popular branch of the route is the Camino France, which is about 780km from St Jean Pied de Port is illustrated in Figure 8. The Camino de Santiago's appeal lies in its uniqueness, its religious charm and a pilgrim experience in enchanting scenery that dates back to the Middle Ages (Lourens, 2007).

Figure 8: The routes of the Camino de Santiago



Source: Lourens, 2007 (Based on Gonzales & Medina, 2003)

Apart from celebrating the holy years, many walkers and cyclists complete the route more for the challenge than for religious reasons. It is seen as an opportunity for an active holiday and to visit historical buildings *en-route*. The wide range of historical and natural attractions is fascinating to travellers and is spread across the many rural communities and villages in Spain and France (Lourens, 2007:477). Pilgrimages to Santiago take place throughout the year, but the most popular times are the 'holy years'. Both pilgrims and tourists take this route, especially during the opening of the Santiago de Compostela Cathedral's holy door in order to be part of the associated celebrations and activities. Statistics show that the number of pilgrims who received the Compostela (certificate of completion) grew to a total number from 192 488 pilgrims in 2012 (Walker, 2013) to 301,036 pilgrims in 2017 (The Confraternity of Saint James, online).

The regional government, Galicia in north-western Spain, is mainly responsible for the promotion of the Camino de Santiago but the detailed planning for the developments are considered at local government level. The success of the Camino de Santiago lies in the combination of funding programmes raised to achieve a number of objectives along the tourism route. The route is predominantly supply-driven, where the national government takes the responsibility for tourism infrastructure and product development. The success and implementation of the route are also due to strong cooperative partnerships established between the local government, regional government and the private sector (Lourens, 2007:480). The route now has a better itinerary and is more clearly demarcated than in earlier years. The route links important elements of destination management, such as the preservation of the cultural heritage, rural regeneration, product development and institutional strengthening. The route was a very important part of the strategic development plan for the Spanish tourism sector and the Camino de Santiago developed a clear plan for the commoditising of cultural assets to boost tourism revenue (Lourens, 2007).

In respect of Astro Tourism, the predominant role of the local and regional government provided a notable lesson learnt from the Camino de Santiago. This particular tourism route has demonstrated its viability through the active participation of the public sector and recognition of the economic contribution that a tourism route brings to rural

economies. This is an important and transferrable action for other tourism routes, including the proposed Astro Tourism route, where interaction between the public and private sector is nurtured and encouraged.

3.4.5 Astro-Chile

The Astro-Chile project was started by a number of public, private and academic organisations across Chile and is seen as the pioneer of Astro Tourism in their developing country. This initiative aims to transform Chile into a first-class Astro Tourism destination that is recognised globally, especially with regards to its appeal, quality and variety of sustainability projects. Chile has developed a 10-year strategic plan to build Astro Tourism in the country. Astro-Chile has also brought together a variety of key stakeholders in the field of astronomy as well as tourism. The key stakeholders involved are the Under-Secretary for Tourism, Servicio Nacional de Turismo (SERNATUR), which is the National Tourist Service in Chile, the Committee on Foreign Investment, Tourism Chile and the European Southern Observatory, Associated Universities Incorporated, the Chilean Astronomical Society, the Catholic University, the Planetarium Foundation and Verde consultants, who specialise in culture, heritage and tourism. All of the above-mentioned stakeholders form part of the implementation programme for the Astro-Chile project (Froyd, 2015).

Chile seized the opportunity to diversify Chilean tourism in innovative ways by collectively promoting the development of astronomy tourism that has global potential. Various studies on national and international levels have been conducted to investigate the demand and supply of Astro Tourism as well as to determine the profile of current and prospective visitors. Tourists are currently seeking authentic and unique experiences and the Astro Tourism niche is in an excellent position to offer something new and different. The niche gives Chile a reputation as a must-see destination. The gaps identified in these studies will determine the quality and competitiveness of the local offerings as well as the opportunities available in the tourism industry (Froyd, 2015).

The lesson that is learnt from Chile, in relation to Astro Tourism growth in South Africa or any other rural area, is that pulling various stakeholders towards a collective goal is

necessary. A variety of expertise to form a joint long-term strategic goal is an effective way of ensuring that tourism development is sustainable and achievable. It is also important to determine the niche market and the status of the destination through the perception of the demand-side. By obtaining this intelligence, the supply-side, which is the tourism value chain and infrastructure, can improve its quality to create a greater appetite for Astro Tourism amongst domestic and international visitors.

3.4.6 The EU Sky Route

The European Union launched the European Astro Tourism Route project, named the EU-Sky Route which falls under the programme 'Cooperation projects that enable transnational tourism products based on cultural and industrial heritage'. The primary goal of this project is to contribute to the development of strategies that promote Europe as an Astro Tourism destination. This project is funded by the European Commission and granted by the Director General for Enterprise and Industry of the European Commission (EU Sky Route Star Tourism Newsletter, 2014). The EU Sky Route aims to establish a network of common intelligence and propose a route of various attractions by forming partnerships between the various countries involved, such as Spain, Poland, Italy, Portugal, Bulgaria and Greece. These countries have adopted the goal of incorporating and establishing European scientific knowledge in astronomy tourism and local leisure activities, expanding and building existing partnerships, establishing a European route of sky observation and attracting new visitors through providing a new tourism experience that is outside the normal spectrum of tourism (EU Sky Route Star Tourism Newsletter, 2014).

The EU Sky Route engaged with the stakeholders, firstly, with an introductory session to allocate roles and responsibilities for each of the partners as well as indicating time frames and milestones for the project. It was here, at the 'Kick-Off' meeting held in Tenerife, Canary Islands, on the 27th to 28th January, 2014 that all the partners agreed to the objective of creating the unique tourism package for Astro Tourism (EU Sky Route star tourism Newsletter, 2015). Proposals from the various partners were made to combine astronomy with other tourism products for each of the segments of the route. It was

proposed that Greece combine astronomy with mythology and that Bulgaria and Italy combine astronomy with ancient history and archaeological resources, while Poland and Spain combine astronomy with rural tourism and nature (EU Sky Route Star Tourism Newsletter, 2015).

The proposed Astro Tourism Route was divided into a number of themes across the various countries, such as volcanoes and stars, inland and rural Astro Tourism, myths and astronomy, nature and the sky and lastly, culture and heritage. Each theme has its unique tourism offering, such as the region of Valencia, which offers two hiking routes that are offered together with stargazing and paleontological heritages (EU Sky Route Star Tourism Newsletter, 2015). The great advantage of the proposed route is that it goes through the south-eastern region of Poland where the population is sparse, thereby providing a perfect setting for tourists who seek peace and closeness to nature. The highest quality of night sky is offered and provides the modern world with a sense that man has lost something very important and very primal. If one has the opportunity to see everything our forefathers saw, we will also be witness to a sky full of stars and the fullness of the Milky Way. Tourism packages include various activities that connect Astro Tourism and accommodation establishments that have become 'astro tourist-friendly' by having their own telescopes and offering workshops on astronomy. The product owners are trained and equipped to share and explain the stars (EU Sky Route Star Tourism Newsletter, 2015).

The above studies provide a rich background for extrapolating examples of principles, processes and guidelines that would contribute towards the establishment and sustainability of tourism routes. The main objectives listed under www.euskyroute.eu/european-astrotourism-route focus on a quality tourist offer, linkages with attractions, as well as the effective collaboration of various stakeholders and partnership, all of which relate to Astro Tourism development in South Africa.

3.5 CONCLUSION

As tourism trends and patterns evolve, so do the trends and patterns of modern tourists. Tourists are no longer interested in mass tours, but desire to be more independent and

more involved with local communities and experience new and exciting adventures. As a result, new niche markets are emerging that create new opportunities for current and emerging tour operators to package tours. Niche markets require aggressive marketing and promotion and tour operators need to work closely with destination marketing organisations and policy makers. For the niche to remain relevant, the destination must hold onto its competitive edge. Tourism routes play an important role in rural tourism settings, linking rural towns and shortening the geographical distance between metropolitan centres. Tourism infrastructure, such as quality access roads, good transportation networks and communication systems at tourism attractions are key elements for the sustainability of these tourism routes. It is important that proper strategies and policies are in place before the route can be promoted and marketed. Government, alongside the tourism product owners play an integral role in creating conducive environments at the rural destinations for both domestic and international visitors (Hashemi & Jusoh, 2015).

This concludes the discussion on tourism route and niche markets. The following chapter discusses the astronomy phenomenon in the tourism context together with deliberations about the respective case studies.

CHAPTER 4: ASTRONOMY IN THE TOURISM CONTEXT

4.1 INTRODUCTION

Astronomy is recognised as one of the world's oldest natural sciences and has over the decades notably influenced the development of global societies and cultures. It observes celestial objects, such as the Moon, planets, stars, nebulae and galaxies. Astronomy refers also to the physical objects and the phenomena that originate outside the atmosphere of the Earth. This includes supernovae explosions, gamma ray bursts and cosmic background radiation. Astronomical attractions comprise of a variety of natural elements, such as rainbows, sunsets and sunrises, solar and lunar eclipses, all of which leave many people in awe, globally (Unsöld, Baschek & Brewer, 2001).

Astronomy derives from the Greek word '*astron*' which means 'star' and involves the law or culture of stars. Astronomy also relates to cosmology, which is the study of the universe as a whole. Primeval cultures have left numerous astronomical artefacts behind such as the Egyptian and Nubian monuments that reflect many astronomical theories, especially about the Sun goddess (Collison & Poe, 2013; Gottschalk, 2012). The Sun, which is the nearest star to the Earth, is the most powerful source of light and releases enormous amounts of energy (Rolston, 2011). The primeval civilizations of the Babylonians, Greeks, Chinese, Indians, Iranians and Mayans were all involved in meticulous interpretations of the night sky. The early Babylonians identified the lunar eclipse which led to the cultivation of mathematical and scientific astronomy. In turn, it laid the foundation for the astronomical traditions that developed in other civilizations. The invention of the telescope was needed before astronomy developed as a modern science. Historically, astronomy included a diverse set of disciplines such as "... astrometry, celestial navigation, observational astronomy, telling time, measuring seasons and the making of calendars" (Astronomy: An overview, 2011:1). The concept of a week, as a period of time, is based on the seven moving objects in the sky and the seven days of the week are named after the Sun, Moon and five planets in the solar system, all of which are visible to the naked eye. The symbol of the star above a crescent Moon pre-dates the advent of both Islam and Christianity. However, after 333 CE, the star of Christianity was replaced by the cross

and the crescent Moon was included in the symbol of Islam (Collison & Poe, 2013; Gottschalk, 2012). The Islamic nomadic tribe of Timbuktu had an in-depth knowledge on astronomy, and relied on predictable astral positioning to navigate their lifestyle (Lydon, 2005:305).

Today, specialised astronomy is identical to astrophysics (Collison & Poe, 2013; Unsöld, *et al.*, 2001). However, there is a slight difference, as astronomy refers to the study of objects and matter outside the Earth's atmosphere together with their physical and chemical properties, while astrophysics refers to the branch of astronomy dealing with the behaviour, physical properties and dynamic processes of celestial objects and phenomena. Since modern astronomical research focuses on subjects related to physics, modern astronomy can actually be called astrophysics (Ruggles & Cotte, 2010). Throughout the world, the stars have been used for story-telling and in the defence of myths and legends (Collison & Poe, 2013). The geocentric model refers to the Earth as the centre of the universe with the Sun, Moon and stars rotating around it (Astronomy: An overview, 2011). In this regard, astronomy can make significant contributions to niche market-based tourism development, especially, as a result of the following:

- Cutting-edge science can capture the minds of the youth, whom are interested in careers in the sciences, engineering and technology sector;
- The high-tech discipline and the instruments required by astronomers need a particular skill that would contribute to the growth of a knowledge-based economy; and
- An interest in the night skies forms a part of all cultures and through improving awareness of such science, it can be better appreciated and understood by local communities (Hellberg, 2011).

Astronomy is different to astrology and should not be misread. Astrology is a belief structure which states that "... human affairs are correlated with the positions of celestial objects" (Astronomy: An overview, 2011:1) Even though the two disciplines share a common foundation, they are completely different. Astrology is characterised by

superstitious beliefs and related rituals, which impedes the progress of astronomical activities of many nations at all levels of society.

4.2 GLOBAL SIGNIFICANCE OF ASTRONOMICAL HERITAGE SITES

The most important historical moments in the development of astronomy are recorded below:

- In 1609, Galileo performed initial astronomical studies using a telescope, where among other phenomena, he discovered the four Moons of Saturn and Sun spots;
- The three laws of planetary motions were developed by Kepler between 1571 and 1630, based on the Tycho Brahe observations;
- In 1687, Newton established the laws of motion and gravitation;
- Bessel established the first rung in the 'cosmic distance ladder' using trigonometric parallaxes for the measurement of the Earth's distance to Venus;
- In 1814, Fraunhofer discovered around 570 spectral lines in the solar light and catalogued them. This discovery paved the way for Kirchhoff and Bunsen, in 1859, to study the physical properties of stars;
- In 1920, 'The Great Debate' concluded that the Milky Way is just one phenomenon among many others;
- In 1926, Hubble discovered that galaxies are receding and velocity is increasing with distance, which led to the 'Big Bang' theory;
- In 1920, Eddington suggested that nuclear fusion was a source for stellar energy and the main principles were worked out after the advent of quantum mechanics by Bethe and von Weizsacker in the 1930's; and
- In 1964, the discovery of the cosmic 2.7 Kelvin background radiation by Penzias and Wilson gave credit to the Big Bang theory (Kachelrieß, 2011:8).

In 2008, the International Council on Monuments and Sites (ICOMOS) and the International Astronomical Union (IAU) signed a Memorandum of Understanding (MoU). The MoU indicated their joint commitment to produce a thematic study that aimed to improve the understanding of the unique characteristics of the astronomical heritage. This

study was followed by a rigorous effort by the UNESCO World Heritage Centre (WHC) to merge astronomy with significant world heritage sites. The study provided a global representation of astronomical heritage sites. It also evaluated the heritage sites in relation to astronomy and archaeo-astronomy, both of which have the potential to demonstrate Outstanding Universal Values (OUV). OUV is the term used in recognition of properties and sites that qualify for inclusion on the World Heritage List (Ruggles & Cotte, 2010). The World Heritage Committee showed interest and recognised the significance of astronomy to the World Heritage Initiative and, therefore, proposed the following cultural properties for inclusion into the concept of astronomical heritage:

- Properties, which in terms of their concept and/or their environmental situation include significant celestial objects or events;
- Representations of the sky and/or celestial objects or events;
- Observatories and instruments; and
- Properties with an important link to the history of astronomy (Ruggles & Cotte, 2010:1).

According to global methodology, there are three main aspects of the 'astronomical system' that are associated with a given place and to which value is bestowed:

- Material evidence of the astronomical place in the form of fixed property and/or moveable objects;
- The results of scientific activities, including but not limited to astronomical observation; and
- Socio-cultural applications and the uses of astronomy at a certain moment or over a period of time (Ruggles & Cotte, 2010:4).

Table 5 illustrates the tangible and astronomical categories of heritage sites according to the categorisation conducted by UNESCO, which are also discussed in the following section.

Table 5: Tangible and intangible astronomical categories of heritage sites according to UNESCO

ASTRONOMICAL CATEGORIES	TANGIBLE IMMOVEABLE HERITAGE	TANGIBLE MOVEABLE HERITAGE	INTANGIBLE HERITAGE
PROPERTY/OBJECTS	Architecture, permanent constructions and structures, fixed instruments.	Plans, moveable artefacts; moveable instruments.	Practical/technical expertise, rules of use and maintenance; structural/architectural history of the site.
RESULTS OF SCIENTIFIC ACTIVITIES	Stone carvings; wall paintings; iconography, palaeography; symbolic representations.	Records/accounts of observations; printed and digital data; sky maps; scientific publications.	Knowledge and understanding; calculations and theories.
SOCIO-CULTURAL APPLICATIONS AND USES	Astronomically aligned; light-and-shadow hierophanies; urban planning and landscapes constructed using astronomy.	Archives; drawings, maps and plans, tools or instruments using astronomical properties.	Predictions of calendars; ideology.

Source: Ruggles and Cotte (2010:4)

4.2.1 Tangible and Intangible Astronomical Heritage Sites

The astrological classification of astronomic heritage sites is determined by the World Heritage Convention and divided into three categories, namely, tangible evidence and intangible heritage, moveable heritage and immoveable heritage as indicated in Table 5. The principal assets of the tangible astronomical heritage are presented as follows:

- Observatories: perceived as scientific monuments or facilities;
- Fixed and moveable instruments: the tangible astronomical heritage, such as portable instruments, moveable domes or floors. The distinction between property and moveable objects differ from a heritage perspective and some do not have any weighty significance for astronomers;
- Material representation of the results of astronomical observations and cognitive understanding as evidenced by:
 - tangible representations of observations as in events, predictions for calendars, time measurements and predictions of celestial activities, such as eclipses; and
 - cosmological and symbolic representations, such as iconography and palaeography;

- Material products stemming from the application of astronomy: the construction, architecture and urbanism related to applied astronomy and the astronomical information and data collection from the instruments;
- Properties whose design and/or landscape setting play a significant role in celestial objects and events;
- Cultural landscapes in relation to the history and development of astronomy where human cultural practices are related to astronomy; and
- Dark night sky areas, where the ability to see the natural starlight and the visual links to the dark sky that create a linkage between humankind and the cosmos through history, are preserved (Ruggles & Cotte, 2010).

Increasingly today, astronomical outreach activities are being made accessible to students and the general public. Such initiatives are useful in popularising all sciences in order to develop a skilled and educated scientific society (Bhattarai & Neupane, 2009). The International Astronomical Union (IAU) together with the UNESCO and the International Dark Sky Association (IDSA) have a common objective to preserve and expand dark skies. Ways to reduce light pollution, maintain and restore the darkness of the sky, are being investigated (Collison, 2011; Weaver, 2011). The significance of astronomy lies in its heritage. The material resources of the history of astronomy are found in archives and documents, which can be found in tangible drawings or on engravings on a monument or a palaeographic inscription. These are commonly referred to as a 'moveable legacy' such as a written document, map or printed matter that serve as proof of the scientific activities throughout history within a cultural context. The recording and communication of information and the data collected plays an integral part in the history of astronomy. It is manifested in various ways, such as cave arts, papyri, cuneiform tablets, paper-books listing observations, paper archives, books and ephemerides, photos in visible and non-visible wavelengths, spectra and digital databases. Scientific knowledge is usually intangible in nature as it is an intellectual framework of the human spirit. This knowledge is recorded by the use of specialised languages, in the written word, mathematic calculations or images, such as drawings, maps, photographs and physical information. One example of this, is when the National

Aeronautics and Space Administration (NASA) was preparing for the Apollo mission to conquer the Moon. Old data and calculations were gathered from various academic papers and manuscripts of astronomers from the 17th Century until the 1950's and analysed. The documents and archives with past compilations were linked to present and modern data. The aim of gathering of all this historic data was to verify that NASA made the most accurate orbital calculations possible (Ruggles & Cotte, 2010). Archaeo-astronomical and astronomical documentation usually consists of the following in heritage terms:

- Records of observations and events and tables of observations;
- Physical images and information, such as photographs, spectra- and radio- maps;
- Interpretation and theories, such as the physical laws of the universe, as well as cosmology, such as global theories and interpretations of the sky and universe;
- The calculations and predictions of ephemerides, calendars, astronomical interpretations and predictions;
- The social uses of astronomy, whether or not it may be rational in modern scientific terms;
- Symbolism, faith and religious uses of astronomy; and
- Art and decoration (Ruggles & Cotte, 2010).

It is stated in the Thematic Study on Astronomy Heritage that "... astronomical heritage has the advantage of being universal. This means that every human culture has a sky and 'astronomy', where the cultural interpretation differs in terms of how they perceive the heavens. Astronomy is thus present in all cultural contexts, from ancient to modern despite the geographic location" (Ruggles & Cotte, 2010:260). When it comes to the management of sites with OUV, it is imperative to consider the protection, conservation and management of these sites. It is important that a management plan for these properties is in place. Engagement with the relevant stakeholders and approval from a government entity is important in order to comply with the regulations set by the UNESCO. Management includes the active involvement of competent professionals in fields such as architecture, construction, urbanism, archaeology and history. Furthermore, the local

tourism organisation and its facilities, namely, education, interpretation and outreach all play a role in the sustainability and feasibility of the facilities. It is important to mention that for an astronomical heritage property to be successful, various sectors and components as well as non-astronomical stakeholders have to venture into a tourism partnership from the onset. Within the World Heritage Convention, a specific approach has been developed for properties with scientific significance.

Astronomical heritage is a cultural property with a cultural and or natural value. When proposing the statement of OUV, astronomy accounts for both cultural and/or natural components (Ruggles & Cotte, 2010). It is inevitable that celestial objects have created some level of interest for human societies throughout the ages. Astronomy forms an essential trait of humankind through its repeating cycles as well as regulating human activity in harmony with the cosmos, such as day and night. When this is realised, the value of astronomy can be identified and clarified in the context of the World Heritage Convention, which qualifies these sites on the World Heritage List. The central heritage component of astronomy is indicative of the intangible knowledge and understanding of science. However, in the modern context, the tangible and intangible have become interwoven, linking the modern with the indigenous, culture with science and the past with the present (Ruggles & Cotte, 2010).

4.3 SPACE TOURISM

Space science offers mankind an opportunity to gaze into the vast cosmos, far beyond the earth's atmosphere (Ingle, 2010a). Space tourism is defined as humans flying into outer space for leisure and ultimate adventure (Duval, 2005; Von der Dunk, 2006). Ancient and pre-modern cultures believed that the cosmos was enclosed within an encapsulated space with the Earth at the centre and the stars fixed in a firm position. For this reason, the ancient Greeks observed the stars as being "... located in a limited sphere that revolved around the Earth, which was perceived as the centre of the cosmos" (Cohen, 2017:23). In the late 16th Century, Giordano Bruno emphasised the notion of a plurality of worlds. This meant that the Sun was just one of an infinite number of stars in the cosmos that supported an infinite number of worlds.

This notion was based more on philosophies than on astronomical proof, but it was the first articulation of the modern ideology of the cosmos on which space travel is based. The aviation era began in 1903, when the Wright Brothers successfully flew the first flying machine, the Kitty Hawk, in North Carolina, in the United States. This event was the beginning of man's endeavour to leave the surface of the Earth and join the realm of birds and eventually venture into outer space (Webber, 2013). According to Belij and Tadic (2015), Astro Tourism is orientated towards the celestial sphere and the extra-terrestrial space without the necessity to depart from the Earth's surface. Those who depart the Earth's surface are astronauts, not astro tourists, which means that Astro Tourism is similar in principle, but yet different from space tourism (Belij & Tadic, 2015).

Spennemann (2008:364) states that "... space tourism is a reality". Space tourism emerged as a result of humanity's on-going desire to 'reach for the stars' as well as the increased evolution of cutting-edge space technology led by the military for political purposes (Cohen, 2017). The motivation for the space tourist is the desire to view the Earth as a whole (Spennemann, 2008). A number of studies have been investigating space tourism in Japan, the USA, Canada, Germany and Australia (Spennemann, 2008). Space tourism is embedded in several distinctive characteristics. Firstly, it is environmentally sensitive because the traveller is entering into a 'space' that differs completely from the environment on Earth. Secondly, space tourism is a form of eco-tourism as it has a direct link to the fragile natural environment. It is usually carried out in the footsteps of explorers and adventurers and these activities require a high level of skill, risk and physical fitness. Space tourists have to go through extensive training led by professionals in the field (Cohen, 2017). Thirdly, this niche has a high level of risk and danger in the absence of safety measures (Duval, 2005; Parsons, 2006). Space travel is perceived as dangerous and since the 1960's, of the 500 astronauts going into outer space, eighteen astronauts have been killed in four separate incidents, whether it was on a mission or during training. The death rate is 3.5% among astronauts, while a few more astronauts experience space sickness (Freeland, 2009; Marsh, 2010).

The first paying space tourist was Dennis Tito, who paid 20 million US Dollars to visit the International Space Station (ISS) in 2001. At first, NASA condemned the agreement with

Mr Tito and the Russian Space Agency, as it could endanger the rest of the travelling crew, by having an untrained traveller on board. However, the Russians Space Industry saw it as an opportunity for an additional source of income and an opportunity to expand the attractiveness of space tourism. After Mr Tito, three other space tourists followed suite, namely, Mark Shuttleworth in 2002, Gregory Olsen in 2005 and Anousheh Ansari in 2006. This tourism venture was a collaborative attempt between Space Adventures Limited and the Russian Federal Space Agency (RFSA) (Duval, 2005; Freeland, 2009; Spennemann, 2008). The 'space race' between the United States and the Soviet Union resulted in the most memorable events: two examples of which are, Yuri Gagarin's first orbital flight in 1961 and the American 1969 Apollo 11 landing on the Moon, which was the first time a human being, Neil Armstrong, set foot on another celestial body (Cohen, 2017). When the Apollo 11 reached the Moon, an US Senator said that "... we are the masters of the universe, we can go anywhere we choose" (Cohen, 2017:23). Chang (2015) stated that space tourism will attract a new kind of traveller, seeking new destinations.

Various legal issues need to be considered for space travelling. The first law promulgated is the Outer Space Treaty which focuses dually on military or political aims and scientific reasons. The Outer Space Treaty states that outer space "... is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means" (Freeland, 2009:10). In general terms, this fundamental principle confirms that outer space (including the Moon and other celestial bodies) is not subject to ownership rights and prohibits, *inter alia*, any sovereign or territorial claims to outer space" (Freeland, 2009:10; von der Dunk, 2006). The second law is the Rescue Agreement that specifies issues pertaining to the personnel of a spacecraft, stating that they have the right to be assisted and safely and promptly returned to Earth. The third agreement is the Liability Convention that covers matters of risk when things go wrong whilst in space. This law states that the 'launching state' is responsible for all related liabilities (Hobe & Cloppenburg, 2004:370). Lastly, the Registration Convention underscores the retention of jurisdiction by the state of registry over that space object and its travelling team, while in outer space (von der Dunk, 2006).

Space tourism is exclusively for the extremely rich and healthy individual who finds pleasure in paying for special training on the ground, a return ticket on the spacecraft and a stay at the cosmic station (Duval, 2005; Hobe, 2007; Kuwait Times, 2017). It is recorded that the price is above twenty million US dollars and should the space tourist wish to go outside the station into the open space area, another fifteen million US dollars will be added. Space tourists have to pass a variety of preparations for the flight to become familiar with the space research programme and the desired protocols. It has been noted that these individuals can consider themselves as private space explorers. There are various forms of space tourism. One form of space travel is through the immediate planetarium system or near-Earth orbit. This is also referred to as extra-terrestrial space tourism. Other forms of space travel are terrestrial-based and many tour operators offer tours to certain locations where solar eclipses are visible (Duval, 2005). The most spectacular observation was the solar eclipse in 1973 when the fastest commercial plane, the Concorde, was used. Another example occurred in Mumbai, where tour operators and air charter companies were stunned by the amount of interest shown for a much closer watch of the total solar eclipse on 22nd July, 2009. The Moon eclipsed the Sun completely and will do so again in 2034. This particular eclipse started soon after sunrise and the towns of Surat, Vadodra, Indore, Bhopal, Varanasi and Patna, all had an exceptional view of this phenomenon.

People are starting to understand the value of an exceptional opportunity and are willing to pay the steep price for such a rare experience (Mitra, 2009). The enthusiasm for space tourism caused Barron Hilton to envision an Orbiter Hilton, that would be free in space and a Lunar Hilton that would be located on the Moon with 100 guest rooms. The Hilton Group even printed promotional reservation cards for clients to reserve a hotel room on the Moon and by early 2000 and 98,000 people had already signed up (Cohen, 2017). Furthermore, Richard Branson of Virgin Atlantic has registered Virgin Galactic Airways as a brand, which suggests that his company will be planning tourism-based travel into space in the future (Duval, 2005). Virgin Galactic already offers space trips that involve travel reaching an altitude of between 100 and 200 kilometres and after engine shutdown, the passengers experience microgravity or weightlessness for about 3-6 minutes and then the vehicle re-enters the atmosphere and returns to Earth. Lastly, intercontinental

rocket transport is more applicable to the military and commercial transportation of passengers and goods. This involves a transit through space so that travel time can be substantially shortened from one point on Earth to another (Freeland, 2009).

Cohen (2017) argues that space tourism will most probably be beyond human capabilities, despite the speculative ideas about travelling faster than light itself. There is a complex yet crucial relationship between the sky, the Earth and those who populate the Earth. The air, even though invisible, is an intricate component of human survival as it is filled with water-laden air, oxygen, nitrogen and carbon dioxide. The atmosphere is necessary for life on Earth and the global population's sustainable future (Rolston, 2011). Therefore, man will be unable to live freely on the Moon or on other celestial objects as the geologist, Cohen (2017:30) stated: "No matter how sophisticated or advanced we become, any traveller to space or any other planetary body will always be bound and limited by his dependence on an oxygen supply and space suits. He or she will never be fully engulfed in the born free sensation felt on Earth. Never will anyone be able to run bare foot through the regolith of the Moon or roll freely down the dunes on Mars. Even people, who will live on Mars in the future, will be restricted to their modules. The strong sensation of being one with nature, feeling, smelling and touching the land will never be experienced by space tourists. "We are intrinsically unsuited to living there" (Cohen, 2017:30).

Space tourism brings a measure of economic benefits and passes on new perspectives to prospective space tourists. Moreover, space tourism represents a new century of commercial endeavours that have the potential to contribute considerably to annual revenues as well as having associated benefits, such as employment opportunities and revenue taxes. Employment will not only be limited directly to space tourism and the spaceports, but also, indirectly, to the supporting industries, such as construction and manufacturing industries (Webber, 2013). Tourism can have a positive spin-off for NASA by encouraging the public to travel into space. This approach has even been supported by research studies and polls that indicate that people would enjoy a trip into space. In 1998, the following recommendations were issued by NASA and the Space Transport Association:

- The national space policy should be examined with an eye towards encouraging the creation of space tourism;
- The expansion of space camps, space themed parks and other land-based space tourism should be encouraged;
- The federal government should cooperate with private business to reduce the technological, operational and market risks as it has done with aviation and satellite communications; and
- The government should sponsor research and development to dramatically lower the cost of space travel and demonstrate ways to reduce the effects of space sickness (Duval, 2005:215).

The South African space sector has committed itself to remarkable activities in order to transform the space landscape. The Cabinet approved the Department of Science and Technology's Ten-Year Innovation Plan that identified space science and technology as an opportunity to contribute to the country's knowledge economy. The National Space Agency Bill was approved and the South African National Space Agency was established in 2010 (Hellberg, 2011). The National Space Strategy has been adopted to lead and implement a feasible and sustainable space programme. The implementation of the strategy will assist the department to leverage the benefits of space science for socio-economic growth purposes and sustainable development (National Space Strategy, 2010).

4.4 ASTRO TOURISM

Gray's Travel Motivation Theory (Najafabadi, 2012:129) provides two reasons why people desire to visit natural settings. The first reason is the desire to embark on the journey from the known to the unknown, which in Gray's theory is called 'wanderlust'. The second reason is that travellers want to experience facilities that do not exist in their own place of residence, which is called 'Sun lust'. Understanding the push and pull factors in the theory of tourism is imperative for tourism destination development. Understanding the motive for travelling to a destination influences its marketing and branding to entice visitors to unique experiences (Najafabadi, 2012). In 1980 the term 'scientific tourism' appeared for

the first time in the literature (Molokacova & Domaracka, 2011:1). Many well-known scientists around the globe have become interested in scientific tourism. Unlike space tourism, Astro Tourism is not a risk to health and is not life-threatening (Belij & Tadic, 2015).

Astro Tourism is categorised as sustainable tourism in which its greatest assets never need to be maintained or developed. It is always available and completely unique in its features and the more the general public are educated, the more they will value and appreciate the beauty of the sky. Thus, whether it be day or night, the sky is considered as one of the highest sustainable fascinations (Najafabadi, 2012). Weaver (2011:39) defined celestial eco-tourism as Astro Tourism "... where the interest of visitors is focused on the observation and appreciation of naturally occurring celestial phenomena". History demonstrates that researchers frequently travel to locations where specific celestial events can be observed. In 1769, Captain James Cook travelled from England to Tahiti to observe the transit of Venus that created a famous observation eclipse (Duval, 2005). It is recognised that Astro Tourism includes specialised activities, which is very different from the mass tourism movement of the 20th Century. This niche is further defined as "... tourism using the natural resource of unpolluted night skies, and appropriate scientific knowledge for astronomical, cultural and environmental activities" (Fayos-Solé *et al.*, 2014:664). Astro Tourism is growing globally as tourists demand knowledge-rich experiences (Fayos-Solé *et al.*, 2014; Muir, 2014).

Location is key when it comes to Astro Tourism as the rationale is for tourists to look deeper into space by means of a clear dark night sky and Astro Tourism is regarded as "... tourism in its most natural settings" (Najafabadi, 2012:129). Hunting for stars and star counts are two of the most well-known activities where tourists engage with astronomy (Walker, Isbell & Pompea, 2007). Celestial observations also include activities such as viewing comets and the northern lights, sky gazing, stargazing, observing interesting cloud formations, vivid sunsets and star-filled skies, all which are regarded as charismatic megacaela or mega-skies. Three types of megacaela can be observed, namely, nocturnal, diurnal or crepuscular, which are described as follows:

Nocturnal is the scientific term for night-time skies that include stars, planets, the Moon, meteor showers and the northern and southern lights;

Diurnal is the term for daytime skies, which includes clouds, rainbows, solar and lunar eclipses; and

Crepuscular, or twilight skies, that include the observation of sunrises and sunsets, and the midnight sun.

Observations of celestial objects can be done with the naked eye or through telescopes and optical devices (Spennemann, 2008). Clear dark skies are a prerequisite for beautiful night skies and through celestial eco-tourism, an opportunity is given to educate observers about the magnificence of its wonders (Weaver, 2011). Comparable to wildlife, Astro Tourism is perceived as a noble way to draw tourists closer to nature (Fayos-Solé *et al.*, 2014). Astro-tourists show an interest in visiting astronomical observations, locations with aurora displays, national, provincial and local parks with dark skies as well as engagements with amateur astronomers who offer public programmes. This particular niche tourist usually travels in pairs, small groups and even alone. The various types of travel composition give the destination an opportunity to create a variety of travel packages. Astro Tourism enables developing countries, even the smallest, such as Serbia, to demonstrate offerings where spectacular planetarium or giant observatories and telescopes are not obligatory: the only requirements being sufficient resources and environment that provides an intriguing night sky (Belij & Tadic, 2015).

Spain, Canada, the United States, Australia, New Zealand, Namibia and South Africa are some of the destinations where Astro Tourism has made a profound footprint. Significant astronomical archaeological monuments and sites have a long history going back many centuries at various sites such as the Nabta Playa in the Nubian Desert, Stonehenge and Woodhenge in the United Kingdom, Newgrange in Ireland, Chichen Itza in Mexico, and Machu Picchu in Peru. The Nabta Playa, which was established two thousand years before the popular British Stonehenge, dates back to around 8 000 BCE. Nabta Playa (800 kilometres south of Cairo, Egypt) is connected to cow sacrifices, which are still found in African cultures today (Gottschalk, 2012). Well-known sites also include the Pyramids

of Giza going back to at least 4,500 BC in Egypt and Cahokia, and the Bighorn Medicine Wheel, Mesa Verde and Chaco Canyon in the United States (Belij & Tadic, 2015).

Astro Tourism is formed by the concept of the science of space and astronomy and a definite practice of eco-tourism. Eco-tourism is nature-based and interrelated with wilderness tourism, adventure tourism, green tourism, scientific tourism and rural tourism (Najafabadi, 2012). South Africa is an eco-destination that became prominent in the 1990s (Viljoen & Tlabela, 2006). In the White Paper on the Development and Promotion of Tourism in South Africa, eco-tourism is defined as "... environmentally and socially responsible travel to natural or near natural areas that promote conservation, have low visitor impact and provide for beneficially active socio-economic involvement of local people" (DEAT, 1996:3). The term eco-tourism is frequently debated, but is mainly focused on rural and undeveloped areas where activities are in harmony with nature. It is known as being "... environmentally responsible travel, and visitation to relatively undisturbed natural areas, in order to enjoy and appreciate nature that promotes conservation, has low negative visitor impact and provides for beneficially active socio-economic involvements of local populations" (Chan & Bhatta, 2013:75). Eco-tourism is a sustainable practice focussing on the experience and tutelage of natural resources. Furthermore, tourism growth, whether it is based on natural or man-made resources, requires accurate planning preceding development, an audit of the sustainable resources and a comprehensive investigation of the economic viability of the identified tourism product. The development aims to limit negative impacts on the natural and cultural environment and most importantly, hold economic benefits for the local communities (Chan & Bhatta, 2013). Hughes (2005 cited in Viljoen & Tlabela, 2006:13) stated that eco-tourism strives to achieve the following:

- Increased travel of international tourists and foreign exchange;
- Increased benefits to the rural communities;
- Improved awareness and knowledge of biodiversity conservation;
- The preservation of the biodiversity; and
- Ensure the sustainability of eco-tourism.

The development of a competitive and sustainable Astro Tourism sector is prioritised by the County Council of Granada in the Caribbean Islands. The Carpathian Sky-Development of Astro Tourism products in Slovakia is used as best practice in the greater Granada region. Best practice is specifically based on integrated work on the part of both the private and public sectors. What this organisation has developed is an implementation plan to optimise Astro Tourism in the region by hosting special training programmes in astronomy, establishing themed routes with information points and training specialised guides in astronomy (TOURage 2014, online). Adjacent to the above initiatives from the County Council of Granada, the Astro Izery Project strives to connect tourists and the natural value of the Izera Mountains with astronomical education under its dark starry sky (Mrozek *et al.*, 2012). Astro Tourism can provide opportunities for unexpected collaborations between the tourism stakeholders, local communities and scientific institutions (Fayos-Solé *et al.*, 2014). Based on the best practice of an integrated approach, the proposed Astro Tourism route has established the foundation for the maintenance of its sustainability.

New South Wales in Australia is continually bracing itself to become the country's Astro Tourism capital by establishing Australia's first Dark-Sky Park. The Warrumbungle National Park was recognised by the International Dark-Sky Association because of the park's exceptional starry nights and nocturnal environment. The area is a magnet for both professional and amateur astronomers. The Park holds the country's biggest optical telescope, the world's largest virtual solar system drive with astro accommodation and tours available to tourists. In the United States, many visitors go to the McDonald Observatory in Texas for astro tours as well as the Kitt Peak and Lowell Observatories in Arizona. Tours are held day and night and the observatory also provides web-based tours, where the visitor has no need to be physically present at the observatory (Collison & Poe, 2013). In Alaska, many visitors go to see the Aurora Borealis or Northern light displays. This phenomenon is more easily seen during the northern winter with its many hours of darkness. Aurora tourism is usually packaged alongside other tour components, such as dog sledding and snow coach tours (Collison & Poe, 2013). The dark skies have become so popular in southern Ireland that companies are now offering Astro Tourism activities, such as stargazing outings in the town near Lake Tekapo (Ibrahim, Ahmad &

Safai, 2012). In Malaysia, interest in astronomy is very strong amongst both the public and students. They are very curious to learn about celestial objects and the phenomena that occur in the universe (Yew, 1995).

Science tourism travellers use regular tourist infrastructure such as hotels, catering establishments and transport, as well as the most modern audio-visual technology for seminars and experiments (Molokacova & Domaracka, 2011). The Astro Tourism niche is perceived to be exorbitant as it requires quality equipment which is expensive and less portable. The range of telescopes varies from accessories such as pointers, eyepieces and filters. It is also essential that there is some level of specialist experience and guidance to boost the Astro Tourism product delivery (Ingle, 2010b).

4.4.1 Light Pollution and the Astro Dark Sky

In the urban world in which we live today, we are unable to see the stellar constellations which a moderately dark sky would provide (Walker *et al.*, 2007). Light pollution is defined as the "... brightening of the night sky caused by street lights and other man-made sources, which has a disruptive effect on natural cycles and inhibits the observation of stars and planets" (Macmillan, 2015:x). Astro Tourism has the potential to draw a vast number of visitors to a destination where skies are free from artificial light pollution. Thus, Astro Tourism entails travelling to Dark Sky sites for astronomical observations using high-tech equipment (Tuszynski, online). Astro Tourism offers a 'peephole', at a price, into the cosmos which is "... consumed by the tourist gaze" (Ingle, 2010a:98). During the Romantic Movement of the 19th Century, the discussion of open spaces became very apparent as open spaces and dark skies became more and more scarce. These desolate places, with their apparent emptiness, which were once criticised by earlier travellers have now become noteworthy attractions (Ingle, 2010a). Ingle (2010a:87) stated that one should make the most of 'space' and 'nothingness'. The urban areas are becoming so over-crowded, and therefore, the world is seeking the beauty of open spaces.

The disconcerting loss of dark night skies, has a lasting effect on "... astronomical research, human health, ecology, safety, security, economics and energy conservation" (Walker *et al.*, 2007:196). The International Dark Sky Association (IDSA) is a well

distinguished authority that is addressing the issue of light pollution. This agency was established in 1988 and was one of the first organisations to caution and educate the public about the risks of light pollution. IDSA encourages society to use lights only when it is truly necessary (Northumberland, 2017). GLOBE at Night is one of the educational programmes established to inform the public, educators and students how to observe and understand the stellar constellations, how to find latitudes and longitudes and the Orion Belt in the night sky, to match the night sky with one of the magnitude charts and, to report observations online and compare these observations, globally (Walker *et al.*, 2007).

4.4.2 Impacts of Light Pollution

The impacts of light pollution on the environment are described as follows:

Astronomical Impacts: In the mid-1970s, the urban night skies changed as light pollution became evident. Developments related to urbanisation have brought about outside lighting, high rise buildings and office blocks that are brightly lit with advertising signs. Urban cities also have lit-up roof tops with architectural features and high-lumen street lighting in most inner-urban areas and on all near-urban arterial roads. Light pollution has, therefore, led society to seek the stars and clear dark night skies (Spennemann, 2008).

Human Impacts: Natural scientists have come to question the true need for outdoor lighting at night, especially, in terms of the negative impacts it has on human populations, animals and plants (Collison, 2011; Collison & Poe, 2013). Outdoor lighting affects the ability of people to see faint objects in the night sky. The dark sky has influenced our human culture, philosophy, religion, science and art for centuries such as the astrology beliefs and calendars and also the development of astronomical activities and observatories (Collison, 2011; Macmillan, 2015). Furthermore, the intrusion of artificial light can be very harmful to human health. A disturbance in circadian rhythms can cause insomnia, high blood pressure, diabetes and even a decrease in melatonin production. Light pollution can also influence the risks associated with cancer conditions (Parkes, 2014).

Ecological Impacts: Light pollution disturbs wildlife and the ecosystem. Globally, the migration of bird species is particularly affected as the city's bright lights cause the bird population to become confused. They mistake the artificial light sources for various celestial bodies, such as the Sun and Moon, which they use as navigational tools. This, unfortunately, misleads the birds so that they fly around light sources for hours until many of them collapse from exhaustion. Increased light time visibility can confuse nocturnal species about the source of light. An example of this is the moth, which is drawn to lights leaving them exposed and vulnerable to predators (Parkes, 2014).

Environmental Impacts: It is important that light pollution is addressed by various means of energy efficiency saving methods that will reduce the greenhouse gas emissions associated with electricity usage. By reducing greenhouse gasses, the local and global ecosystem will most definitely benefit (Parkes, 2014; Ruddy *et al.*, 2015).

Economic Impacts: The installation of various energy efficiency saving methods in businesses and residential properties are costly in terms of materials and skilled labour. On the other hand, opting for dimmers and lower wattage bulbs causes a reduction in overall electricity consumption (Parkes, 2014).

4.5 INTRODUCTION TO THE CASE STUDY

This section presents the case study chosen for the research, namely, the tourism destination surrounding the SALT and SKA astronomy projects. It is argued that the region is an appropriate area for this project, because of the suitability of the environment for astronomy development. The Karoo is a rural area that has the potential to develop Astro Tourism. This chapter also provides an historical background of astronomy in the South African context, and discusses relevant government developments.

4.5.1 Historical Background of Astronomy in South Africa

More than 25,000 years ago, the KhoiSan (the unifying name for two groups of peoples, the pastoral Khoi(khoi), or Hottentots, and the foraging San or Bushmen), acknowledged that time was found in the stars. The ancient Khoikhoi rituals included ceremonies around

the new Moon and the KhoiSan made rock paintings and pictograms of comets they witnessed in caves (Gottschalk, 2012). The two indigenous groups experienced a deep gratitude and appreciation of the stars, which was woven into their daily lives. Dr Wilhelm Bleek, who was a 19th Century scholar, learnt that the San (Bushmen) observed the movements of the planet Jupiter and its four Moons with their naked eyes. Ingle (2010a:87) refers to the Karoo as a "... scientific sublime blend ..." of "...aesthetic, religious and scientific elements". "In some sense, interest groups are also exploring themselves: there is an embedded desire to expand one's personal horizons" (Ingle, 2010a:87).

John Herschel is perceived as the father of astronomy in South Africa. Herschel was a very distinguished scientist in his day, to the extent that he was buried alongside Isaac Newton in Westminster Abbey. He mapped out the southern hemisphere's skies, following the footsteps of his father who mapped the northern hemisphere's skies. Herschel had a choice to establish his observatory in either Australia or South Africa and eventually chose South Africa. The Royal Observatory was established in Cape Town in 1820. His observations in the Cape were recorded between 1834 and 1838 and were so voluminous that it took nearly a decade to gather the information for publication. The work of this renowned scientist and the presence of the observatory in Cape Town has subsequently attracted many well-known scientists to this site. The city started to grow as a reputable scientific destination. Many distinguished universities, such as Yale, Harvard, Leiden, Radcliffe and Michigan, collaborated with the Royal Observatory to sustain the astronomy station. The scientific heritage of John Herschel is archived in the South Africa Astronomical Observatory (SAAO) (Ingle, 2010b:93). The purpose of the SAAO is to provide essential research in astronomy and astrophysics through the provision of a world-class facility and the promotion of astronomy and astro-physics in Southern Africa. SAAO's administrative and computing facilities are still in Cape Town, but due to increasing light pollution, the SAAO had to relocate its observational functions to a rural town on the periphery of the urban centre, to Sutherland, which has a purer and darker night sky (Ingle, 2010a).

The southern part of Africa has always played a significant role in astronomy on the African continent. The observatories in Southern Africa are the South African

Astronomical Observatory (SAAO) that is home to the Southern African Large Telescope (SALT) in Sutherland; the Square Kilometre Array (SKA) in Carnarvon, the Hartebeesthoek Radio Observatory (HartRAO) in Gauteng and the High Energy Stereoscopic System (HESS) in Namibia (Govender, 2011; Whitelock, 2008). At the Hartebeesthoek station, lunar and interplanetary missions were initiated by NASA, receiving images of the planet Mars. The first images of Mars and other planets were taken by the Mariner IV spacecraft. South African astronomers at the HartRAO have access to some of the largest facilities for astronomy in the world and the SALT in Sutherland is the largest single optical telescope in the southern hemisphere (National Space Strategy, 2010).

4.5.2 Governmental Developments

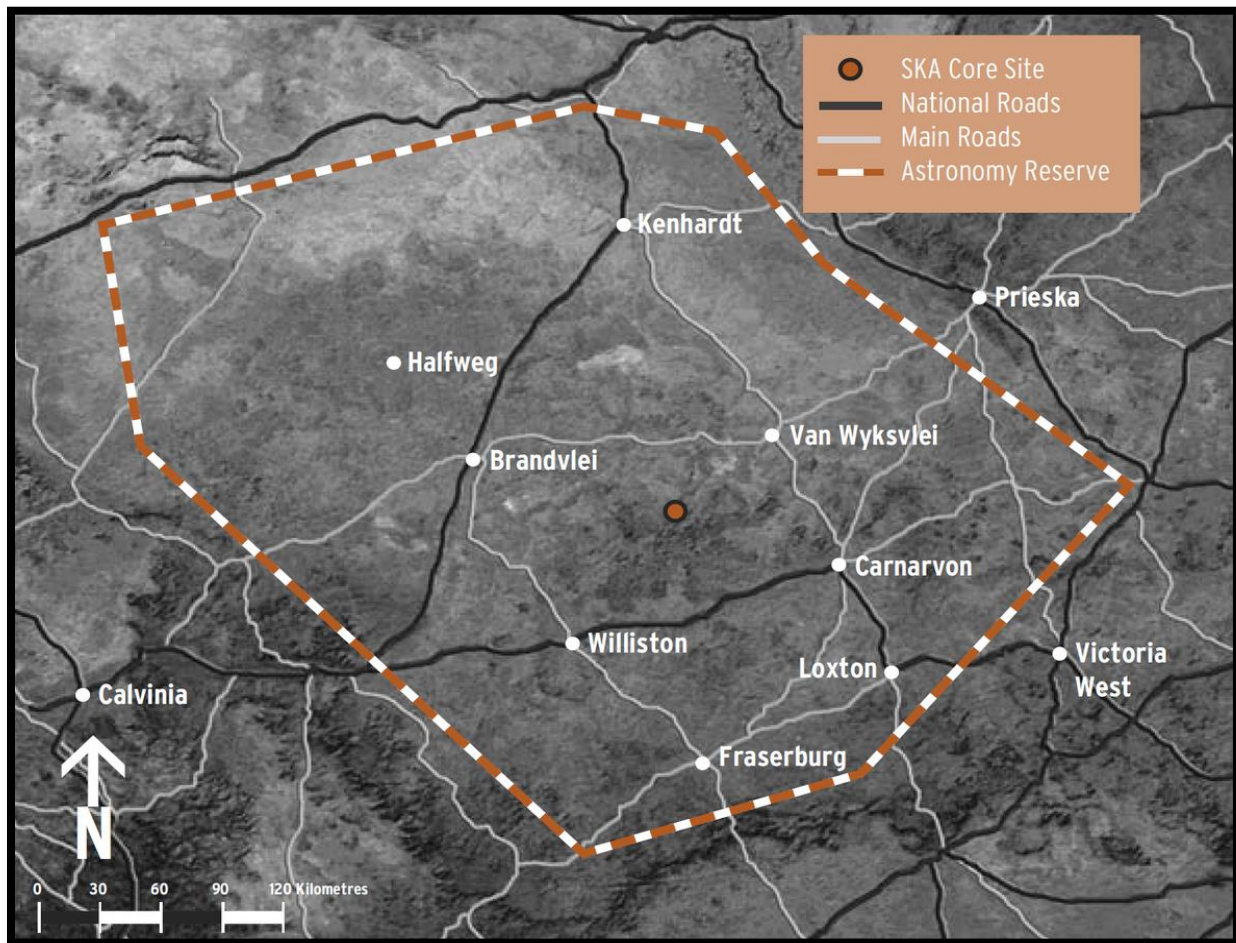
South Africa's government aims to grow its knowledge base of astronomy and to build on South Africa's strengths to become the preferred destination, leading in the field of astronomy. Projects and associated international investment for constructions and operations is utilised for world-class research. The SKA, which is the most powerful radio astronomy telescope being built, is highlighted in the NDP for the crucial role it is playing in national development (SKA South Africa, online).

South Africa has brought into law the Astronomy Geographic Advantage Act (AGAA) as a way of preserving and protecting areas in the country that are most suitable for optical and radio astronomy and to provide intergovernmental cooperation and public consultation on matters pertaining to astronomy (Astronomy Geographic Advantage Act, 2007; Govender, 2011). The purpose of a declaration of areas as astronomy advantage areas is to "... ensure that the geographic areas in the Republic that are suitable for astronomy and related scientific endeavours due to, among other things, atmospheric transparency, low levels of light pollution, low population density or minimal radio frequency interference are protected, preserved and properly maintained; enhance the existing geographic advantage of those areas highly suitable for astronomy and related scientific endeavours through the restriction of activities that cause or could cause light pollution or radio frequency interference or interfere in any other way with astronomy and

related scientific endeavours or astronomy advantage in those areas; and provide for the management of those areas in the public interest and in accordance with good national and international practices” (Astronomy Geographic Advantage Act No, 21 of 2007:14).

An area of 12.5 million hectares, bordered by Upington, Calvinia, Fraserburg and De Aar, which surround the SKA core site will be protected as a radio astronomy reserve, with regulations controlling the generation and transmission of interfering radio signals. This act gives the Minister of Science and Technology the authority to protect the area from future radio interference and to limit light pollution (Gottschalk, 2012; Hellberg, 2011; SKA South Africa, online). The regulations stipulated in the Astronomy Geographic Advantage Act affects a number of farmers in the region and their employees, as the Act regulates radio transmissions in the area. SKA SA works closely together with DST and the Agricultural Union in order to implement alternative solutions for services that might be lost, such as television, emergency communications, trunked telecommunications and internet connections (SKA Newsletter, 2009). Figure 9 illustrates the geographical area surrounding the core astronomy sites in the Karoo.

Figure 9: The Karoo Central Astronomy Advantage Area



Source: SKA South Africa (2014)

The Director of Radio Astronomy at DST, (Nemaungani, 2016) presented an insightful overview of astronomy in South Africa indicating that this developing country is a front runner with regards to optical astronomy as SAAO has been operational for nearly 200 years and SALT has provided significant investment in the field of astronomy for 15 years. Nemaungani (2016) emphasises that the South African government is committed towards astronomy and astrophysics and highlights that “... it is also important to maintain a basic competence in flagship sciences, such as physics and astronomy for cultural reasons” (White Paper on Science and Technology of 1996:6). In 2012, the South African Government adopted the National Infrastructure Plan. The plan envisages transforming the economic landscape, stimulating job opportunities and strengthening the delivery of basic services. The Cabinet of 2012 established the Presidential Infrastructure

Coordinating Commission (PICC) where 18 Strategic Integrated Projects (SIPs) were approved. The SIPs were developed with the aim of supporting economic development and addressing service delivery in the rural areas. The SKA and MeerKAT are reflected in SIP 16 as a global mega-science project. It was reported that the “.... high level PICC interventions and coordination will occur across all sectors of infrastructure delivery in South Africa and ensure the smooth and efficient construction and operation of the SKA telescope” (SKA South Africa online). To date the PICC has approved 18 SIPs which are illustrated in Appendix 10, on page 300.

The SKA SA formed a partnership with the private sector and the Northern Cape Department of Education to empower scholars at the local schools. A computer laboratory was built by the SKA SA e-Schools Initiative and the Carnarvon High School was furnished with 43 desktop computers, a laptop, an interactive whiteboard, printer and strong internet connectivity. A community knowledge centre was established where three qualified teachers have been appointed by SKA SA to teach mathematics, science and information technology at the high school (Hatchuel 2013). A bursary programme is available annually for scholars in Williston, Brandvlei, Van Wyksvlei and Carnarvon, which is a constructive method of encouraging the youth to find a keen interest in science and astronomy. SKA SA initiated a post-doctoral fellowship to provide sufficient scientists, engineers and technicians to participate in the design and construction of the telescopes (Hatchuel, 2013).

The DST invited the National Department of Tourism (NDT) to a SKA core site visit with the Deputy President, Cyril Ramaphosa, in February 2015. This invitation was extended on grounds that the world’s largest telescope would attract a very special and sophisticated niche tourism market. The SKA is not only characterised by the advancement of cutting edge astronomical science, but it exemplifies integral advances in Astro Tourism that positions South Africa as a high technological investment and as a global competitive destination (Van Wyk, 2015). The NDT continues to prioritise engagements with provincial authorities with a focus on tourism development opportunities. The NDT has demonstrated an interest in the SKA Project through the following initiatives:

- Active participation in the Northern Cape SKA/MeerKAT Working Group meetings, together with the Northern Cape Department of Economic Development and Tourism (DEDAT);
- Continuous support for tourism product development by investigating the potential growth of the Karoo rural area by means of growing Astro Tourism and route development; and
- Preparation of a proposal for the establishment of the SKA Science Visitor Centre as an Interpretive Centre to enhance the destination's plan for tourism consumption (Van Wyk, 2015).

4.5.3 Square Kilometre Array

Many countries submitted their bids to host the SKA, but it was eventually awarded to South Africa (Whitelock, 2008). In conjunction with SALT, the new initiative of the Square Kilometre Array (SKA) monitors the interstellar related radio wavelength activities. The SKA initiative is a global project with 24 participating institutions, representing 10 countries such as Australia, Canada, China, Germany, Italy, New Zealand, South Africa, Sweden, the Netherlands and the United Kingdom. The SKA is an international project that aims to make a significant contribution to the global knowledge economy as its sustainability depends on advanced technology, hardware and information technology, which is yet to be developed. This telescope will be capable of investigating the early universe and provide new insights into the very first generation of stars and galaxies. The SKA is the largest basic science project ever undertaken in South Africa and holds a number of potential spin-offs especially in science through the computational requirements for large-scale processing of big data in real time (Woudt *et al.*, 2013).

The Square Kilometre Array (SKA) is a \$2-billion project that aims to build the world's largest radio telescope in a collection area of a square kilometre (one million square metres). The SKA is a mega telescope that is 100 times more sensitive than the biggest, current existing radio telescope and will include 500 000 antennae across southern Africa and Australia (Hellberg, 2011; SKA South Africa, online). In order to operate, the SKA requires the world's fastest supercomputer and 200Gbps internet speed (SKA South

Africa online). The collection of phased array antennae will collectively form a single telescope that will provide enormous volumes of data. The telescope will trace galaxies to investigate the rate of the expansion of the universe and identify the nature of dark energy. It will deliver three-dimensional galactic maps of cosmic magnets which will be able to detect extra-terrestrial signals and find planets that are capable of supporting life. It will also bring an understanding about how galaxies are stabilised and influence the formation of stars and planets and regulate solar and stellar activity. Extra-terrestrial radio signals emanating from the Milky Way were first detected in the 1930s by Karl Jansky (Singh, 2005). Radio telescopes are used by astronomers to explore the universe by detecting radio waves that are released by a number of objects. Various objects are detected at observatories through radio wavelengths including supernovae, interstellar gas, pulsars and active galactic nuclei (Astronomy An overview, 2011:5).

The radio telescope will discover how the earliest black holes and stars were formed. It will focus on Albert Einstein's theory of general relativity and search for gravitational waves, which have been predicted but not yet found. Thus, the SKA project will stimulate further studies about gravity, neutral gas, and possibly lead to new discoveries and theories in the discipline of astronomy. Recently, in 2017, it was found that the South Africa's MeerKAT observed "... a rare burst of activity from an exotic star, demonstrating outstanding capabilities as a new instrument for scientific exploration" (SKA Africa, 2017:1). The article contains the study of a magnetar, which is one of the most magnetic objects known in the universe. This discovery was published by 29 authors in 'The Astrophysical Journal' in 2018. This discovery could only have been made with the MeerKAT, which also triggered observations from NASA X-ray telescopes orbiting the Earth (SKA Africa, 2017). Dr Bernie Fanaroff, the former director of the SKA South Africa project, stated that the SKA "... is expected to collect more data in one week than humankind has collected in its entire history. Mankind will, therefore, have its first view of what the universe looked like 13.7 billion years ago" (SKA South Africa, online).

Radio telescopes must be located as far away as possible from manufactured electronics or apparatuses that release radio waves that interfere with faint radio signals coming from the universe in order to function optimally. Carnarvon was chosen to host the SKA

because of its remoteness, sparse population and its location in a very dry climatic region. The core site for the MeerKAT is 95 kilometres north-west of Carnarvon (SKA South Africa, online).

The MeerKAT (Karoo Array Telescope) was initiated with a full subsidy pledge from the South African government, it being the forerunner phase of the SKA (Ingle, 2010a:95). It will be the most sensitive radio telescope in the southern hemisphere and is anticipated to be completed by 2024. The project includes the construction of approximately 4,000 satellite dish antennae that will be positioned in a radio quiet zone and the data will be processed from a central site in Cape Town. The SKA project will provide an enormous amount of data for analysis in the various fields of astronomy, quantum physics and space science programmes at educational institutions in South Africa as well as internationally. Revolutionising compound telescope dishes and innovative signal processing hardware and algorithms are currently being developed. The vast amount of data is attracting a great number of scholars and students in related fields, such as mathematics and physics. (SKA South Africa, online).

The test bed of seven dishes of the MeerKAT, the KAT-7, has already been completed and is depicted Figure 10 below.

Figure 10: KAT-7



Source: SKA South Africa (2013)

The MeerKAT consists of 64 dishes that will serve an essential role in the preparation phase of the SKA (Ingle, 2010a; SKA South Africa, online). One of the substantial benefits that the SKA Carnarvon and Williston is the high-tech wireless telecommunications system transmitting data from the satellite dishes to Cape Town. It is envisioned that the destination will attract investors and entrepreneurs, because they will be able to connect with, and expand into international markets due to the effectiveness of the internet connectivity (Ingle, 2010a). The list below illustrates the anticipated timelines for completion of the SKA project (SKA South Africa, online):

- The precursors; MeerKAT started start data collection in 2016 and estimates to merge with SKA 1 in 2020;
- SKA pre-construction of the design and prototype from 2013 to 2016;
- Prototypes on the ground in 2016;

- Tenders for construction of SKA Phase 1 (SKA 1) finalised in 2017;
- Construction of SKA 1 from 2018 to 2023;
- Early data collection with (part of) SKA 1 from 2020;
- Design of SKA 2 from 2018 to 2021;
- Construction of SKA Phase 2 (SKA 2) from 2023 to 2028; and
- SKA 2 infrastructure in place, probably earlier, from 2021 to 2022.

The SKA provides a great opportunity for Africa to drive human capital development projects, harness science and technology and advance African technology growth goals. The project will lead to new innovations, creativity and advanced infrastructure as well as providing job opportunities during the construction phase and the maintenance and operational phases of the SKA, thereby contributing greatly towards the fight against poverty over the next 50 years. Deputy President, Cyril Ramaphosa (cited in van Wyk, 2015) stated that technological progress through the SKA project will help improve livelihoods and is both a product and enabler of technological advancement. Foreign direct investment (FDI) into the SKA will be €1.5 billion and €2 billion in capital expenditure with an anticipated annual operations and maintenance budget of approximately €150 million per annum for the next 50 years. Through the construction of the SKA, the skills capacity of scientists and engineers will be advanced in the fields of science and technology in this country as well as in partnering countries. Approximately 600 astronomers, worldwide have already submitted proposals to work with the SKA forerunner, the MeerKAT. The SKA project drives technology in the development of antennae, fibre networks, signal processing, software and computing. The benefit of SKA to the average South African is the expected upgrade and expansion of communication networks in the country as well as improved cross-border connectivity with partners in neighbouring countries, such as Namibia and Mozambique (Hatchuel, 2013). SKA SA has brought investment into the area through the construction of infrastructure, such as upgrading roads, installing power lines and optical fibre networks as well as establishing facilities for the operation and maintenance of the telescope (SKA South Africa, online).

4.5.4 Southern Africa Large Telescope (SALT)

The SALT demonstrates optical astronomy, which is the oldest form of astronomy and also called visible light astronomy. Originally, optical images were drawn by hand but in the late 19th and 20th Centuries, the images were made by using photographic equipment. Today, images are produced by "...digital detectors, particularly detectors using charge-coupled devices and recorded on modern mediums" (Astronomy: An overview, 2011:6). The telescope is used to enhance "observations in the near-ultraviolet, down to the atmospheric cut off and for high time resolution" (Whitelock, 2008:39). The SKA, on the other hand, depicts radio astronomy that observes the radiation of wavelengths instead of discrete photographs (Nemaungani, 2016).

The small town of Sutherland is situated at an altitude of 1,759 metres and was selected as the site for the Southern Africa Large Telescope, where the first telescope was installed in 1976. Sutherland has a unique combination of topographical and meteorological characteristics that makes it an ideal astronomical site (Ingle, 2010a). SALT was set up at a cost of US\$32 million, including its instruments and is "... collecting 25 times more light than previous African telescopes" (Ingle, 2010a:93-95). It is a 10-m class optical telescope modelled on the Hobby-Eberly Telescope (HET) in Texas, but with remarkable upgrades (Whitelock, 2008). When the South African government approved the construction of SALT, it agreed to contribute towards the costs for capital construction, with the remaining costs being covered by international partners. Foreign universities from Germany, New Zealand, Poland, the United States and the United Kingdom, all participate in SALT-based research (Ingle, 2010a). The development of astronomy in South Africa has a number of goals, which are captured in the 'SALT Collateral Benefits Plan'. This plan focuses on the following areas (Ingle, 2010a:95):

- Ensuring the advancement of the economy, technology and society;
- Providing educational and training opportunities;
- Enhancing science education and awareness throughout South Africa;
- Developing technology infrastructure and edu-tourism at educational facilities; and
- Extending the benefits of astronomy and space science to the rest of Africa.

Development occurred as a result of the following activities relating to the SALT (Van Sittert, 2002):

- The signing of a partnership agreement between the SAAO and the previous Council of Sutherland in 1999;
- An informative excursion to the Texas Astronomy Education Centre at the McDonald Observatory in 2000;
- The soil digging Ceremony of SALT in 2000 and the signing of a twinning agreement with Fort Davis, Texas, and
- The allocation of R1.35 million in LED funds by the Northern Cape Provincial Government to kick-start the new initiatives.

4.5.5 SALT and SKA Tourism Development Initiatives

The Astro Tourism market is slowly growing in South Africa and seeks to provide tangible socio and economic benefits (SKA South Africa, online). As SALT gained momentum, opportunities for increased employment have been created (Gottschalk, 2012; Govender, 2011; The Karoo Development Foundation, 2012). Sutherland is being referred to as the 'Star Gazing Capital' as it is believed to be the darkest spot on Earth and perfect for star gazing and astronomical activities (Square Kilometre Array Telescope NCRA-TIFR, 2014). The influx of high profile astronomers, scholars, academics and engineers to the Karoo region has impacted positively on the daily livelihoods of local residents. The most remarkable impact on the community of Sutherland, since the establishment of the Southern African Large Telescope (SALT), has been on the local tourism industry (Govender, 2001). It has been recorded that 85% of visitors to Sutherland travel from the Western Cape Province to break away from city life. Private businesses offer tourists a variety of products and services, such as accommodation establishments, restaurants, curio shops and even star gazing tours. The issue of an uneven tourism space economy in South Africa was highlighted as a challenge as early as 1936, but with the recent tarring of the road between Matjiesfontein and Sutherland, SALT became more accessible (Ingle, 2010b). With improved access, tour operators predicted the establishment of an Astro Tourism route in the region and began apportioning tourism offerings to the smaller

Karoo rural, thereby addressing the uneven tourism space economy (Ingle, 2010a; Rogerson, 2014).

The tourism and hospitality industry bought into the astro theme and adopted space motifs and stellar imagery by naming their establishments, Skitterland (Glitter land) Guesthouse, Jupiter Restaurant, Sterland (Star land), Southern Cross and the Vlieënde Piering (the Flying Saucer) (Ingle, 2010a). Kambro Kind is one of a number of guesthouses that offer guests accommodation and refer guests to Sterland for informative stargazing lectures and stargazing with 280mm telescopes throughout the year. The demand for tours during the peak season months (June, July and August) exceeds the capacity of the observatory, so that many operators are making use of amateur telescopes and attractions provided by local communities (Govender, 2011). Star parties have become even more popular for ordinary people and amateur astronomers (Belij & Tadic, 2015; Najafabadi, 2012). Some guest farms in the surrounding rural area have their own equipment and maintain a strong relationship with amateur astronomers. These amateur astronomers offer astronomical events, such as astrophotography and star parties at these accommodation establishments. The multiplying effect of growth resulted in packaged souvenirs, such as homemade knitted accessories like beanies, scarves, gloves and warm meals to guard against the cold, as the sky is better seen during the cold winter nights. This multiplying effect is another opportunity for entrepreneurial growth (Ingle, 2010a). Other attractions centred around the astronomical theme draw a great number of eco-tourists, such as botanists, astronomers, game rangers and authors-in-residence (Ingle, 2010a).

Neither Sutherland nor Carnarvon has a visitor information centre (VIC). This is a gap in the tourism product offering, as there is no central point where information about the destination and its offerings are available. Baseline data and tourism statistics about the trends and patterns of tourists (demand) and the number of available beds (supply) are unavailable in the Karoo rural area (Atkinson, 2012). The destination will not develop sustainably unless a cohesive tourism association is established in the area. A tourism association would be ideal to pull all the relevant stakeholders and resources together in order to reach the common goal of improving the area's attractiveness (Atkinson, 2012).

Furthermore, according to Govender (2011), current tourism enhancement is occurring as a result of the following activities:

- The working relationship between key stakeholders such as Astronomy for African Development, Karoo-Hoogland Local Municipality, National Development Agency, Tourism Enterprise Programme, Succulent Karoo Ecosystem Programme and the Military Service Corps;
- Local communities having frequent meetings with the observatory to discuss mutual ideas and development plans;
- Further exploration of the socio-economic roles of the SALT in South African society is taking place with the involvement of national and local government;
- Tour guiding training programmes are provided to local unemployed individuals;
- Negotiations regarding upgrading the quality and tarring of the roads to make the observatory more accessible to visitors;
- Partnerships have been established in order to source funding for developmental projects; and
- The establishment of the SALT and initiation of an arts and crafts programme that gives local community members self-sustainable opportunities to develop marketable products and services for tourists.

The public's understanding of science and technology in the Northern Cape Province is very limited. Activities to mobilise the general public, such as free tours and star gazing activities, are organised for the local community on a continuous basis by the observatory. The observatory offers the communities opportunities to discuss their astronomy belief system as compared to the scientists' perspective. Public awareness programmes include tours to the observatory in Sutherland, various exhibitions and festivals, indigenous astronomy development initiatives as well as monthly online newsletters (Govender, 2011).

4.6 CONCLUSION

This chapter discussed astronomy and space travel in the context of tourism development. Astronomy has the potential to stimulate economic and entrepreneurial opportunities as it is evident that these projects have had positive impacts on the tourism and hospitality industry. Limited light and radio pollution are key enablers for the development of Astro Tourism and to ensure the areas that have been identified to host such projects are preserved and protected.

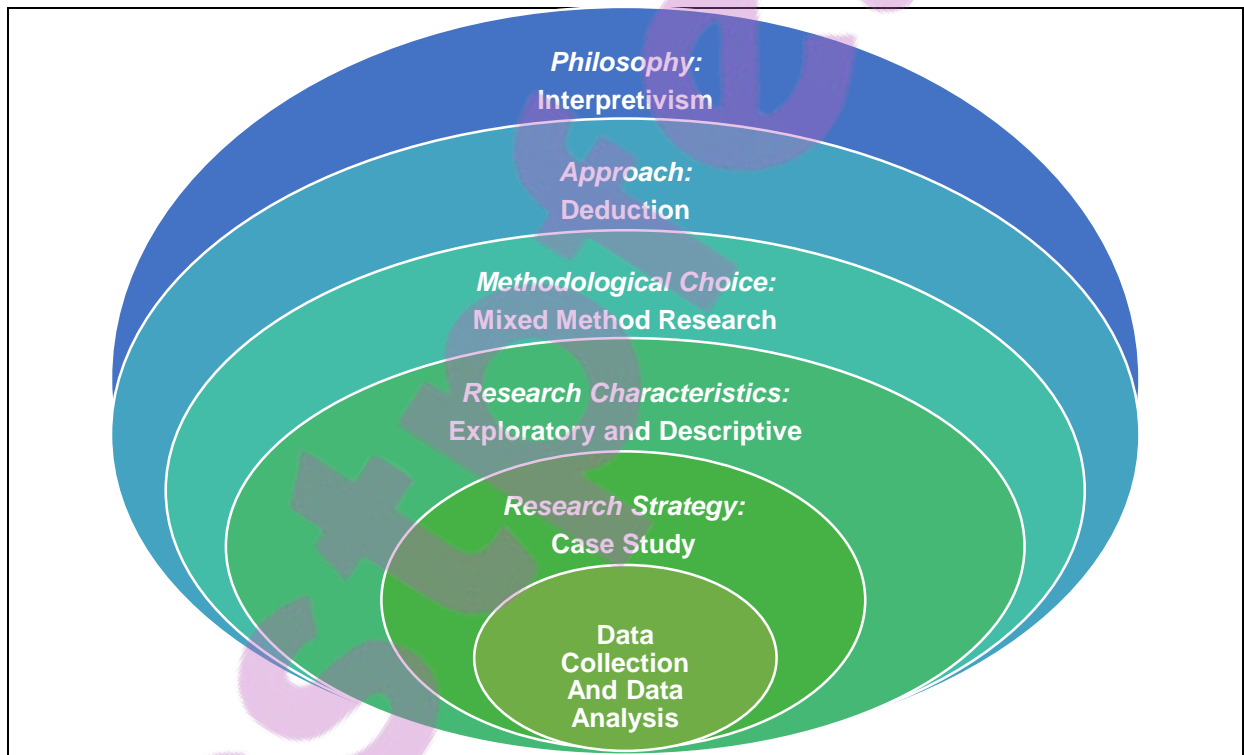
The literature reviews up to this point have described the built knowledge related to sustainable rural tourism development and the niche based tourism routes that are linked to astronomy as huge pull factors to rural areas. This provides a substantial foundation within which the empirical research is embedded. The next chapter explains the research design and methodology that was followed in order to achieve the purpose of the research as described in Chapter 1.

CHAPTER 5: RESEARCH METHODOLOGY

5.1 INTRODUCTION

In the previous chapters, the literature relevant to this research study was reviewed to address the theoretical objectives of the study. This chapter outlines how the research philosophy and the research approach addressed the research objectives from an empirical perspective. Furthermore, this chapter deliberates on the research design, sampling method, data collection and the data analysis processes that were followed. Also included in this chapter are the challenges faced during the fieldwork, the aspects considered for the quality assurance of the data as well as research ethics. The empirical research process followed is illustrated in Figure 11.

Figure 11: The empirical research path



Source: Adapted from Saunders *et al.* (2012)

The research design is a logical process in which the outcomes are based on the linkages found between the theoretical framework and the empirical data collection and analysis thereof. Thus, the research design of this study was developed to address the research problem in hand, which, in principle, is to bridge the gap between Astro Tourism and the sustainable development of a rural destination through a tourism route (adapted from Saunders *et al.*, 2012). This study was guided by interpretivism as a research philosophy, jointly with mixed methods to collect data from the case study. The aim of this chapter is to demonstrate the methodology underpinning the empirical objectives of the research, as summarised in Table 6. The table illustrates the specific research objectives in relation to the target population and sample and the research instrument/s employed as well as the relevant analytical tools used.

Table 6: The detailed empirical research process

QUANTITATIVE RESEARCH			
RESEARCH OBJECTIVES	TARGET SAMPLE	RESEARCH INSTRUMENT	RESEARCH ANALYSIS TOOL
<p>Objective 4: To determine the demographics and travel characteristics of visitors to the towns selected in the Karoo, in the Northern Cape Province.</p> <p>Objective 5: To investigate the tourists' overall perceptions and experience of the destination at the hand of an Importance-Performance Analysis (IPA).</p>	Visiting tourists (N=130).	Structured questionnaires.	SPSS, Version 24.0.
QUALITATIVE RESEARCH			
RESEARCH OBJECTIVES	TARGET SAMPLE	RESEARCH TECHNIQUES	RESEARCH ANALYSIS TOOL
<p>Objective 6: To determine stakeholder perceptions of tourism development in respect of Astro Tourism activities in the region of the case study in relation to tourism product development and infrastructure; local economic development and the Pro-Poor tourism approach; community participation and ownership; stakeholder collaboration and integrated roles and responsibilities.</p>	<p>Residents:</p> <ul style="list-style-type: none"> Local communities (N=44); Local Tourism businesses (N=23). <p>Non-residents:</p> <ul style="list-style-type: none"> Government sector representatives (N=11); Industry stakeholders (N=9); Stakeholder engagement: workshops, meeting and forums (N=11). 	<ul style="list-style-type: none"> Focus groups; In-depth interviews; Semi-structured questions; Minutes and note taking; 	ATLAS.ti, Version 7.0.81.

Source: Researcher's own construction

5.2 PHILOSOPHY: INTERPRETIVISM

An interpretivist research paradigm was followed as the researcher views all humans as social actors (Saunders *et al.*, 2012:137). This method provided an understanding of the differences between the various social actors and demonstrated that they play a more significant role than the objects studied, and in this case, the tourism destination (Bryman, 2012). The reality was not objectively determined, but instead socially constructed. The

researcher grasped the significance of the roles, responsibilities and perceptions of the various stakeholders in the tourism and astronomy disciplines, together with an understanding of the communities and, furthermore, how a collaborative approach or lack thereof, has a direct effect on all developmental initiatives (Bryman, 2012).

The interpretivist perspective is based on the assumptions that "... human life can only be understood from within as social life is a distinctively human product: the human mind is the purposive source or origin of meaning and human behaviour is affected by knowledge of the social world that cannot 'exist' independent of human knowledge" (Maree, 2007:59). Intersubjectivity was also crucial in understanding that individuals and communities alike are responsible for the underpinning progress of a project. Behaviour is constituted by these social interactions and, hence, social interpretation is required to understand and accept the collective outcomes achieved by those involved. It was anticipated that once the social actors were observed in their natural environment, there was a greater probability that their behaviour would be understood more accurately and truthfully. In the social context, social interactions, together with the norms and standards of the social actors or communities, were fundamental to the scrutiny and understanding of human behaviour, perceptions and decision making. The core purpose of interpretivist research was to provide a deeper perspective of a situation. Data was analysed in order to provide insights as to how the respective individuals or communities made sense of their situation or the phenomena they encountered (Maree, 2007).

This research study included the process of deductive reasoning in which conclusions were based on the observations and the outcomes of the research results. The logic of deductive inference was based on the fact that the study generalised information from the specific to the general. The data collection was used to explore a real world phenomenon and identify themes and patterns in order to develop a conceptual framework (Saunders *et al.*, 2012). One very important aspect of the interpretivist philosophy was for the researcher to adopt an empathetic stance and enter the world of the social actors (Saunders *et al.*, 2012). For this very reason, the role of the researcher played an important part in the successful outcome of the methodological approaches, which are discussed in the next section.

5.2.1 Role of the Researcher

The researcher was an active stakeholder with close relations to the respective destination developments as well as the project at hand. The researcher's profession enabled her to adopt the role of an internal researcher who was privileged to have exclusive access to the key stakeholders and project management teams most relevant to the scope of this study. The benefit of being an internal researcher is that an in-depth understanding of the complex interactions between the social actors as well as the difficulties surrounding the field of study was obtained (Saunders *et al.*, 2012). The researcher also had the privilege of having established professional relationships with the provincial and local tourism authorities as well as the SKA management team. This gave the research study a definite advantage in respect of in-depth insights and information that would not easily have been obtained under normal research conditions.

The language barrier was a very sensitive issue with regards to the rural communities in the area (Viljoen *et al.*, 2010). A key aspect that enriched the outcome of this research study was that the researcher could engage with the local community in their indigenous language. All communication, written and verbal, was relayed in Afrikaans, a language that the local residents were most comfortable with. It paved the way for robust interviews and frank debates. As a result, a growing trust developed between the researcher and the local community members, as was the case with the owners of the local tourism businesses. The disadvantages, on the other hand, were that the researcher was continuously cautious about the assumptions and preconceptions that accompanied such a position. It was assumed that the researcher knew the environment too well, which might hinder an exploration of issues that could further enrich the research. Therefore, familiarity was kept in check by ensuring that all communication was professional and unbiased. Consequently, it was important to ask the basic questions as well as the more sensitive and intricate questions, with no preconceived assumptions (Saunders *et al.*, 2012).

5.3 RESEARCH STRATEGY: CASE STUDY

The research strategy was the plan of action used to reach the ultimate goal of the study. It outlined the path of how the research problem would be addressed, while serving as the methodological link between the chosen philosophy and the subsequent choice of methods. For this study, case study research was used to conduct an empirical inquiry into the phenomenon under investigation (Maree, 2007). It is also called ideographic research, which provided an opportunity to observe and discover the research topic within a real-life context (Leedy & Ormrod, 2014; Saunders *et al.*, 2012). The case study approach enabled the researcher to capture the project for a specific period of time through relevant observations, interviews, documents and past records in order to gain an understanding of a complex situation. It permitted a holistic view of the project under review and its effects on the surrounding environment. This surrounding environment included the physical as well as all the historical, economic and social factors that may have had an impact on the real world problem (Leedy & Ormrod, 2014). Setting boundaries for the study allowed the researcher to focus effectively on the specific research area. The study was contained by attaching it to a specific time (cross-sectional), place (Karoo rural region), activities (Astro Tourism; tourism routes), definition (stakeholder collaboration) and context (sustainable rural development) (Maree, 2007; Saunders *et al.*, 2012).

Data analysis in this case study followed the steps as indicated by Leedy and Ormrod (2014):

- Step 1:** Organisation of details about the case, where the specific facts about the case are arranged in a logical order;
- Step 2:** Categorisation of the data and the categories identified in accordance with the literature review in order to give the data substantial meaning;
- Step 3:** Interpretation of single instances extrapolated from the data in respect of the case being studied;
- Step 4:** Identification of the patterns and themes formulated from single data instances; and

Step 5: Synthesis and generalisation of the overall results portrayed, which have implications beyond the specific case study, were constructed.

The rural Karoo region, together with its tourism products and the offerings that surround the renowned astronomical project, the Square Kilometre Array (SKA) and the South African Large Telescope (SALT), was used as a case study. The towns identified to form the Astro Tourism route were Sutherland, Fraserburg, Williston, Loxton and Carnarvon. These towns met all the criteria identified in the concept of 'astronomy advantage' forming part of the sustainable development of Astro Tourism. As the SKA and SALT are the most recent and long-standing scientific projects led by the South African national government, the researcher saw an opportunity to analyse phenomena that may have been gone unnoticed.

Before data collection commenced, the researcher received formal approval (dated 25 March 2015; refer to Appendix 4: page 277) from the Northern Cape Department of Economic Development and Tourism to undertake research in the Northern Cape Province. The department also furnished the researcher with relevant reports and databases of related tourism products. It was agreed that the researcher would share all the research findings with the department and other interested parties (Maree, 2007). The case study method, together with the use of multiple data-collection methods, provided the researcher with opportunities to triangulate the data. Ultimately, the triangulation process followed, thereby strengthening the research findings, where all the various pieces of information were drawn together to make consolidated recommendations (Leedy & Ormrod, 2014; Maree, 2007; Saunders *et al.*, 2012). The target population, which will be discussed in the following section, substantiated the development of the Astro Tourism route and formed a crucial part of the sustainable destination development process.

5.4 METHODOLOGICAL CHOICE: MIXED METHOD RESEARCH

This research study made use of the mixed method approach, which included both qualitative and quantitative data. The data was combined to determine whether the

findings from one method mutually confirmed the findings from another method (Saunders *et al.*, 2012). The rationale for the utilisation of mixed methods was to gain generalised perspectives from the demand side, and an in-depth understanding from the supply side of the tourism value chain. The quantitative component delivered a baseline of tourism statistics previously lacking for selected towns Astro Tourism and included the demographics, travel characteristics and experiences of visitors to the region. The qualitative component included the perceptions, offerings and challenges faced by the experts and supply side of the tourism industry. The use of both methods was important as it contributed towards finding the links that resulted in the establishment of a collective understanding of the viewpoints of all the stakeholders, as reflected in Figure 12, by undertaking triangulation of the findings towards a cohesive whole (Leedy & Ormrod, 2014). By so doing, the researcher increased the quality of data by consulting multiple sources of data.

Figure 12: Participants in the research study



Source: Researcher's own construction

The quantitative and qualitative research methods are discussed in the two following sections, taking into account the sampling process, data collection, instruments development and data analyses of each method respectively.

5.5 QUANTITATIVE RESEARCH

The quantitative component consisted of structured questionnaires and descriptive data analysis to profile astro-tourists as a niche market segment. This market had not been adequately explored in the tourism literature and, in order to contribute to the body of literature, the researcher aimed to investigate the astro-tourists concerning their demographics and travelling trends and patterns. The quantitative research analysis was descriptive of nature, portraying the characteristics of an existing phenomenon (Van Zyl, 2014).

5.5.1 Quantitative Data Sampling

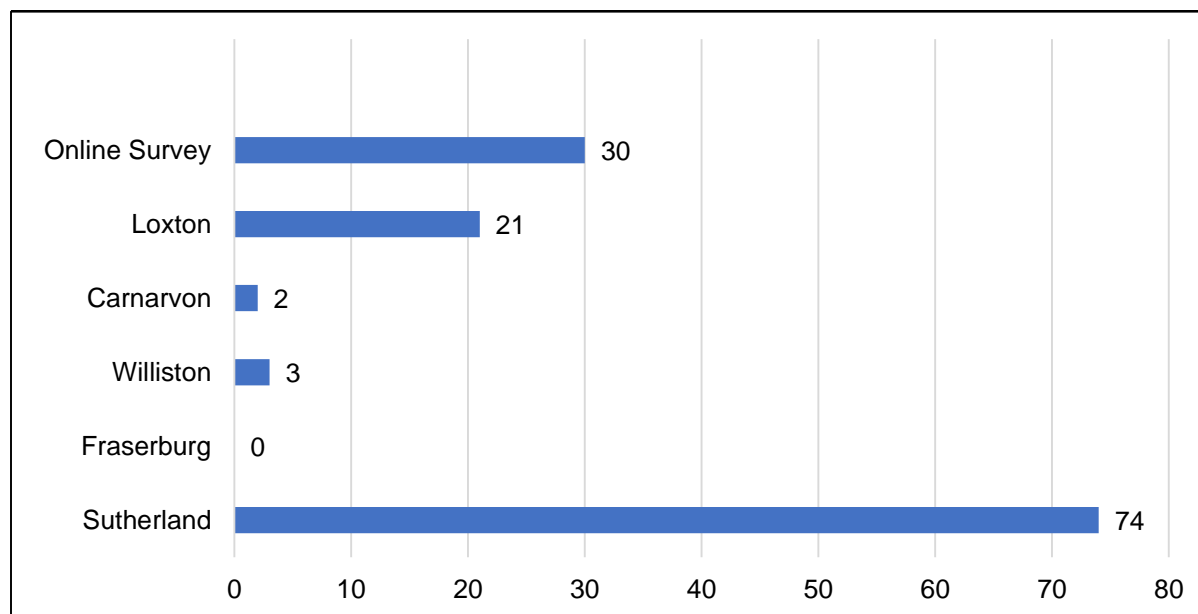
To collect quantitative research data, the researcher visited the towns selected for the study by distributing the structured questionnaires at various tourism establishments, such as hotels, guesthouses, restaurants and the observatory in Sutherland. Of all the towns, Sutherland had the highest number of established tourism products and, therefore, presented the potential for reaching the highest number of respondents. Self-completed questionnaires were mailed back to the researcher by the owners of the establishments and staff at the observatory. Thus, non-probability sampling in the form of convenience sampling was used as the researcher had no control over the intensity of participation. Convenience sampling provided ease of access with relatively low costs. However, the weakness of this sampling was that it often lacked credibility, because the likelihood of the sample representing the real population was very low (Saunders *et al.*, 2012:284).

In order to improve the response rate, a web-based version of the questionnaire was designed using the SurveyMonkey online survey tool. The link to the online questionnaire was shared and posted on a variety of social media such as Twitter, LinkedIn and Facebook accounts of the following:

- SKA South Africa;
- Karoo Space;
- I love Sutherland;
- Sutherland Hotel;
- Southern Cape Astronomy Club;
- Celestron Telescope SA;
- Lord Carnarvon;
- Sutherland Southern Cross; and
- The National Astrophysics and Space Science Programme.

During the fieldwork period, the researcher received a total of 130 completed questionnaires from tourists visiting the selected towns. Of the total number of respondents, 30 were online questionnaires and 100 were paper-based. Figure 13 provides a breakdown of the samples achieved in the different towns as well as the online questionnaire. The sample size was determined, as that there is no baseline visitor statistics for the region, and that the rationale of the quantitative research process is merely exploratory.

Figure 13: Breakdown of participating tourists



Source: Researcher's own construction

5.5.2 Quantitative Research Instrument

The self-completed structured questionnaire included a participant information sheet to brief the respondent about the study. The consent section included a place for the respondent to sign, confirming the agreement between the respondent and the researcher. The consent form (Appendix 1: page 271) was an important requirement that ensured ethical behaviour, the protection for both parties and a clarification of the boundaries related to privacy and confidentiality (Saunders *et al.*, 2012; van Zyl, 2014). In order to ensure that the research instrument contributed towards answering the research objectives effectively, a systematic approach was followed in accordance with a data requirement table (Saunders *et al.*, 2012):

- Step 1:** Decide whether the main outcome of the research is descriptive or explanatory;
- Step 2:** Subdivide each research question or objective into more specific investigative questions about what additional data needs to be gathered;
- Step 3:** Repeat the second stage if it is felt that the investigative questions are not sufficiently precise;
- Step 4:** Identify the variables about which data needs to be collected in order to answer each investigative question;
- Step 5:** Establish the level of detail required from the data for each variable; and
- Step 6:** Develop measurement questions to capture data at the level of the data required for each variable (Saunders *et al.*, 2012:425).

5.5.2.1 Questionnaire development

When developing the measurement instrument, it was important to identify the sources containing the most common errors and to avoid them as far as possible. Mouton (2001) lists the following as the most common mistakes in questionnaires:

- No piloting or pre-testing;
- Ambiguous or vague items where words are undefined, too vague or an over-assumption about the anticipated response;

- Double-barrelled questions where more than one response is requested from one question;
- Effects of the order of item is not considered, thereby making completion of the questionnaire and train of thought challenging;
- Fictitious constructs expected from respondents where the knowledge required is outside the respondent's scope of expertise;
- Leading questions that influence the respondents into providing a particular response;
- Negative phrased or double negative questions are inappropriate and unethical;
- Poor and confusing layout of the questionnaire can influence the participation rate;
- Instruments that are too long could discourage respondents from completing all the questions;
- Sensitive or threatening questions should be avoided at all costs as it brings a refusal to participate in the research study; and
- Avoid mono-operational bias to ensure that the questionnaire is easy to complete and follow and by so doing, respect the time and effort of the respondent.

The draft questionnaire was presented to the Ethics Committee of the University of Pretoria that ensured the above mentioned errors were eliminated and that the fieldwork was conducted in an appropriate manner. The final questionnaire (Appendix 5: page 279) that was distributed consisted of 24 questions over four pages. The rationale for the questionnaire was to obtain adequate information about who the visitors were, where they resided and how they experienced the region. Questions included a combination of multiple choice questions, open ended questions and 5-point Likert scales. The Likert scale descriptors included levels of agreement from 'strongly disagree to strongly agree', and satisfaction from 'not satisfied at all to very satisfied'. The aim was to compare the level of importance to the level of satisfaction in terms of the various tourism product offerings. Table 7 depicts the layout of the questionnaire in relation to the variables and measurement scales used.

Table 7: Quantitative data requirements

RESEARCH OBJECTIVE 4: To determine the demographics and travel characteristics of visitors to selected towns in the Karoo in the Northern Cape Province;			
RESEARCH OBJECTIVE 5: To investigate the tourists' overall experience of the destination using an Importance-Performance Analysis (IPA).			
<i>Type of research:</i> Quantitative research in order to determine the trends and patterns of the tourists who visited the Karoo towns surrounding the SALT and SKA			
Variable	Investigative questions	Theme	Question format
Question 1 - Question 13	To investigate the demographics and associated travel characteristics.	Tourism product development.	Multiple choice.
Question 14 - Question 20	To explore the tourists' overall experience of the destination.	Tourism product development; local economic development.	Likert scale.
Question 21 - Question 24	Determine re-visit intention. Demographics (age, gender, level of education and employment).	Tourism product development.	Multiple choice Open ended.

Source: Researcher's own construction

5.5.3 Quantitative Data Analysis

The Statistical Package for Social Science (SPSS) version 24.0 was used to store and analyse the data. This technologically based analysis presented a number of advantages. It was user-friendly, which allowed the researcher to capture and present the data in easily readable table formats. A range of statistical analyses were made available, including both the descriptive and inferential statistics. The speed at which the analyses were completed once all the data had been captured was an advantage as also noted by Leedy and Ormrod (2014).

5.5.3.1 Descriptive Statistics

SPSS was used to produce descriptive statistics that unfolded the demographics, travelling trends and patterns of the tourists visiting the respective Karoo towns. Quantitative data can be divided into categorical and numerical data (Saunders *et al.*,

2012). Descriptive statistics were found in questions 1 to 13 where the respondents were given a list of answers and those answers were coded into a numerical value for analysis purposes.

5.5.3.2 Inferential statistics

The process of finding relationships between the variables is referred to as statistical inference (Saunders *et al.*, 2012). A 95% level of confidence was used to indicate the precision of the estimates of the population as a percentage that was within a certain range or margin of error. *T*-tests were performed to determine whether there were any significant differences between the expectation and satisfaction levels of the respondents. Furthermore, the *t*-test compared the difference in the means of the importance and performance levels using a measure of the spread of the scores.

5.5.3.3 Importance-Performance (Satisfaction) Analysis

The Importance-Performance Analysis (IPA) was first proposed in 1977 as a tool to develop firm management strategies. It is a method used in marketing research to determine the level of customer satisfaction (Gonçalves *et al.*, 2014). The IPA used the mean ratings of the importance and performance of the tourism products and current state of infrastructure to create a two-dimensional grid that identified gaps and consequently opportunities for improvements that guided strategic planning efforts (Gonçalves *et al.*, 2014). The quality characteristics were divided into four categories according to their level of importance as well as the level of improvement required. These categories included the terms 'concentrate here; keep up with good work; low priority; and overkill'. The results were illustrated on a grid, where the features were evaluated according to strengths, such as 'keep up the good work' and weaknesses, such as 'concentrate here' (Martilla & James, 1977). The matrix with the four quadrants assisted with the production of an action plan to minimise the negative difference between the importance and the satisfaction levels.

5.6 QUALITATIVE RESEARCH

The purpose of qualitative research was to investigate human behaviour in the social, cultural and political context. Qualitative research, also referred to as naturalistic research, took place in a natural setting to get an in-depth understanding of a phenomenon. The researcher's role in qualitative research was to retrieve information from the participants while simultaneously demonstrating sensitivity for cognitive access. The results produced non-numerical primary data (Van Zyl, 2014). The qualitative research analysis of this study took on an exploratory approach. This approach was a valuable way to commence research on a broad basis and then narrow it down, leading to a more in-depth understanding of the research problem. It had the advantage of being flexible and able to change direction as the results of new data appeared and further insights came to the fore (Saunders *et al.*, 2012). Qualitative research typically includes a pilot study to establish the rationale for gathering new data and determine whether valid and reliable interesting patterns were being formulated (Mouton, 2002). Table 8 captures the links between the theoretical themes and the investigative questions related to Objective 6.

Table 8: Qualitative data themes and questions

RESEARCH OBJECTIVE 6: To determine stakeholder perceptions of tourism development in respect of Astro Tourism activities in the region of the case study in relation to tourism product development and infrastructure; local economic development and the Pro-poor tourism approach; community participation and ownership; stakeholder collaboration and integrated roles and responsibilities.	
RELATED THEORY AND SUB-OBJECTIVES	INVESTIGATIVE QUESTIONS
Tourism Product Development and Infrastructure.	<ul style="list-style-type: none"> • Short and longer term strategies to capture a greater Astro Tourism market share. • Major challenges with regards to tourism product development and how these challenges can be overcome.
Local Economic Development and Pro-poor approach.	<ul style="list-style-type: none"> • Level of beneficiation of the local community from the Square Kilometre Array (SKA) and South African Large Telescope (SALT).
Community Participation and Ownership.	<ul style="list-style-type: none"> • Suggestions as to how the local community can benefit even further from the SKA and SALT.
Stakeholder collaboration and integrated roles and responsibilities.	<ul style="list-style-type: none"> • Role and responsibilities expected from the various stakeholders. • Indication if a tourism association that incorporates all tourism products and services will be successful.

Source: Researcher's own construction

5.6.1 Qualitative Data Sampling

Two types of sampling can be undertaken: probability sampling based on the principles of randomness and probability theory, or non-probability sampling where all the participants do not have an equal opportunity to be included (Maree, 2007). For the qualitative component, non-probability sampling was used, based on subjective judgement and the provision of a variety of alternative techniques to gather data (Saunders *et al.*, 2012). Purposive sampling or judgemental sampling was used as it enabled the researcher to use discretion to determine the selection of participants. Participants were selected in terms of relevance, their expertise as well as interest in answering the research questions and interest to address the research objectives. Heterogeneity, where participants displayed various appropriate characteristics, was a factor in the sampling process in order to gain maximum range in respect of the data being gathered (Saunders, 2012). The targeted participants had sound expertise, rich

experience and detailed knowledge together with the ability to convey their views adequately to the researcher. Snowball sampling was another technique followed where some of the participants, such as those involved in the local tourism and astronomy products, volunteered to participate and even assisted with the data collection process. It was evident that the outcome of the study carried results that could affect them either directly or indirectly (Maree, 2007).

The qualitative data samples were gathered from databases provided by the provincial and local tourism industry. The databases, which had to be updated by the researcher, included most of the Karoo tourism businesses in the respective towns being investigated. The researcher communicated via email to schedule interviews and focus groups and requested that tourism product representatives complete the semi-structured questionnaire. Key stakeholders were identified by the SKA and SALT project management departments. The sampling process took a funnelling approach in which the researcher purposefully selected more participants than would be needed. It was important to apply the criteria listed below to obtain a sample of high quality and one that was appropriate for the research design:

- The sampling strategy was relevant to the conceptual framework and the research questions addressed by the research;
- The sample was likely to generate rich information on the type of phenomena which needed to be studied;
- The sample enhanced the transferability of the findings;
- The sample produced credible descriptions/explanations concerning the real life context;
- The sample took ethical preconditions into consideration; and
- The sampling was feasible in terms of money and time, and practical issues of accessibility had to be considered (Maree, 2007).

Data saturation in qualitative research was an important aspect that was considered in the research design. Saturation was imperative to produce excellent quality work, as Maree (2007:84) stated "... there are no published guidelines or tests adequate for

estimating the sample size required for research saturation". There are two forms of saturations, namely, theoretical saturation and data saturation. Theoretical saturation refers to the development of the theory and occurs when all of the main variations of the case study have been identified and incorporated into the emerging theory. Data saturation points to the fact that all the themes and categories have been saturated and no new data has been generated (Maree, 2007). The researcher targeted to achieve theoretical and data saturation through exploring a range of theories including a number of different stakeholder groups in the data collection process. According to Maree (2007), Saunders *et al.* (2012) and Strauss and Corbin (2008), data saturation occurs when the data collection includes all the new data relevant to the theme of the study to the extent that the themes become well developed and the relationships between them are understood. However, in this study, data saturation has not been realised as the timeline was limited and the sample was not all inclusive.

5.6.1.1 Local communities (n=44)

The term focus group refers to group interviews. Here, the real life situation was clearly described and debated further in a trustworthy group of relevant participants (Saunders *et al.*, 2012). As the research study had a strong educational element (the tourism offering), the researcher found it most pertinent to conduct focus groups with local school educators to represent the local communities. The researcher sent a letter (Appendix 2: page 273) to the principals of schools in the study area seeking permission to conduct focus group sessions with the educators. The request was very well received and a time was scheduled for one school per town. The school principals of the participating schools identified educators who lectured on relevant subjects in the curriculum, such as tourism, natural sciences and history.

Focus groups were held at the participating schools, using the participants' vernacular language, Afrikaans (Appendix 7: page 285). It was important to build relationships so that much more detailed information could be gathered as the participants' suggestions and inputs would play a key role in the development of the proposed Astro Tourism route.

Group interviews usually included four (4) to twelve (12) participants. Table 9 illustrates the focus group schedule for the local schools in the rural towns.

Table 9: School focus group schedule

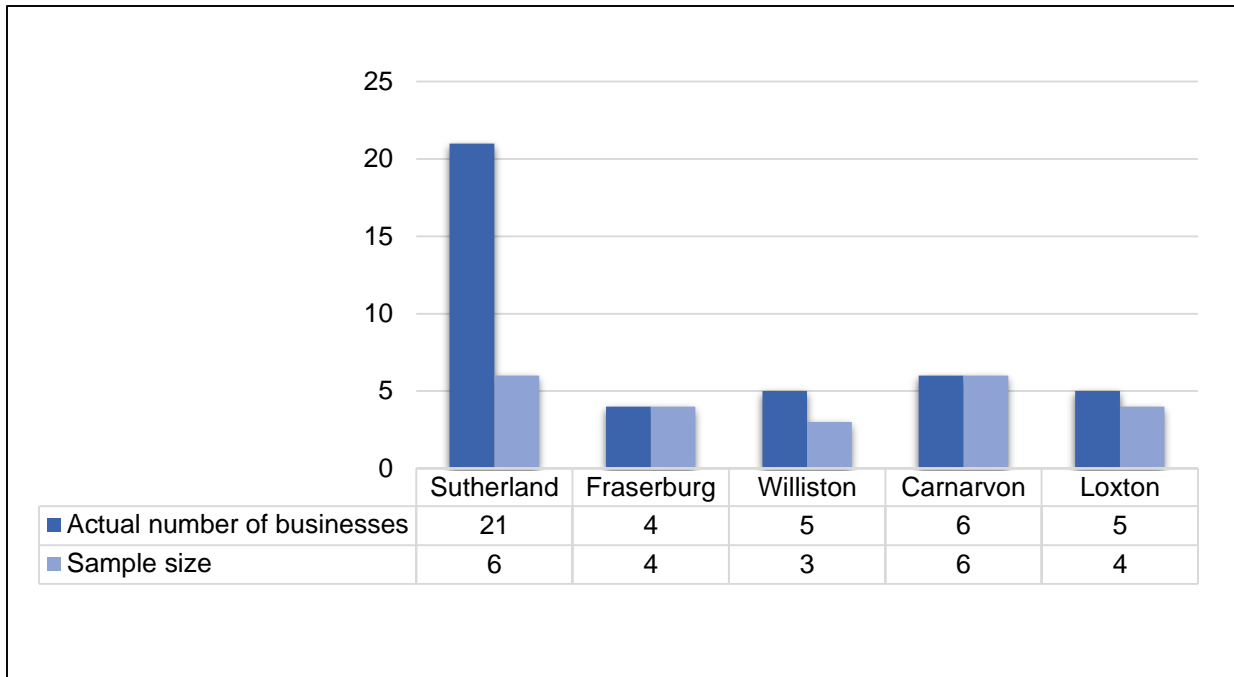
CODES	TOWN	EDUCATORS	NUMBER OF EDUCATORS	SCHEDULED DATE
COMM1	Sutherland	School A	12	11-Apr 2016
COMM2	Fraserburg	School B	11	11-Apr 2016
COMM3	Williston	School C	4	13-Oct 2016
COMM4	Carnarvon	School D	4	14-Oct 2016
COMM5	Loxton	School E	13	13-Oct 2016

Source: Researcher's own construction

5.6.1.2 Tourism Businesses (n=23)

As much as the views and opinions of the local community members were valued, so were those of the local tourism businesses. They are the experts on market related conditions in the area. The local tourism business owners are the managers and owners of the attractions, accommodation establishments and restaurants and they play a key role in the sustainability of the tourism route. Their opinions and views about the success of the tourism route were invaluable, being central to upholding the quality and standards of the tourism destination. The Karoo rural area had a total of 42 tourism businesses spread across Sutherland, Loxton, Fraserburg, Williston and Carnarvon. The number and sample size from each town is indicated in Figure 14.

Figure 14: Participatory tourism businesses vs. total number of tourism businesses



Source: Researcher's own construction

In order to acquire pertinent inputs, views and experiences from the local businesses, semi-structured questionnaires were developed (Appendix 8: page 288). The questionnaire included questions to determine the ownership and the general profile of the businesses such as the products and services provided, the number of employees, resident status and whether they made use of locally produced products. Other questions were investigative, being mostly open-ended and requiring a more in-depth response.

Questionnaires were distributed through email from an updated database where the researcher continually followed and encouraged the recipients to complete the questionnaire in their own time and pace, but within the data collection timeframe. A total of 23 out of a possible 42 tourism businesses completed the questionnaires, achieving a 53% response rate. The participating tourism businesses were categorised according to the tourism sub-categories shown in Table 10 as well as the number of respondents in each of the sub-category.

Table 10: Sample and coding of participating tourism businesses

PRIMARY TYPE OF BUSINESS	SUB-CATEGORY	CODE
ACCOMMODATION	Farm Stay; Self-catering; B&Bs; Guest-houses; Hotels.	TB1, TB15 TB14 TB2, TB19, TB21 TB7, TB9, TB11, TB12, TB16 TB4
CUISINE	Restaurants; Coffee Shops,	TB10, TB22 TB3, TB6, TB23
CULTURE and HERITAGE	Local crafts; Art Gallery; Museum; Conservation NGO.	TB8 TB5 TB5 TB13

Source: Researcher's own construction

5.6.1.3 Government sector representatives (n=11)

The government sector representatives have influential decision making powers and play an important role as part of the policy making authority concerning the sustainable development of astronomy and the tourism industry. Their expert counsel was helpful to solve the challenges faced and to identify the historical significance of the region. This sector has the means to source funding and lead the collaborative initiative for development. In-depth interviews were held with government representatives at local, provincial and national level (Appendix 6: page 283). The participants were given the opportunity to discuss their insights freely with no to very little pre-determined questions (Saunders *et al.*, 2012:432). Therefore, the researcher had exploratory discussions with government representatives from the tourism as well as the astronomy industry in order to investigate the sustainability of the tourist route.

The researcher led discussions in accordance with the related themes of this study, namely, tourism products development and infrastructure, local economic development and the pro-poor approach, community participation and ownership and stakeholder collaboration. Table 11 illustrates the list of the participating representatives in all three

spheres of government. To ensure anonymity of the government representatives, their respective positions within the organisations are not indicated.

Table 11: Sample and codes of relevant government sector representatives

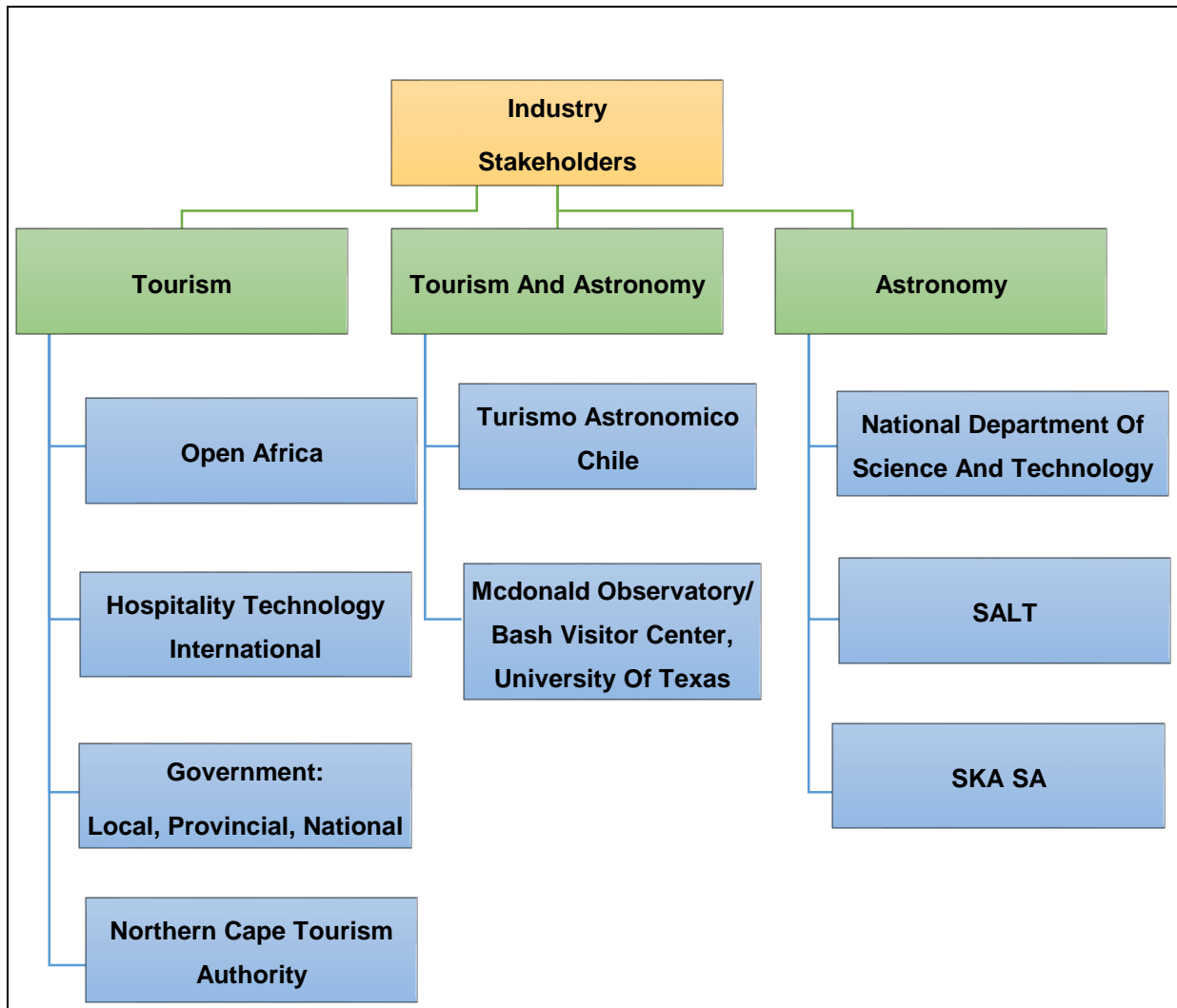
CODES	LEVEL OF GOVERNMENT	GOVERNMENT DEPARTMENT
NAT1	National	National Department of Tourism.
NAT2		National Department of Tourism: Tourism Incentive Programme.
NAT3		National Department of Science and Technology.
NAT4		National Department of Science and Technology.
PROV1	Provincial	Northern Cape Department of Tourism and Economic Development.
PROV2		Northern Cape Department of Tourism and Economic Development.
PROV3		Northern Cape Tourism Authority.
DIS1	District	Pixley Ka Seme District Municipality.
DIS2		Namakwa District Municipality.
LOC1	Local	Karoo Hoogland Municipality.
LOC2		Kareeberg Municipality.

Source: Researcher's own construction

5.6.1.4 Industry stakeholders (n=9)

The researcher scheduled semi-structured interviews with active industry stakeholders representing the tourism and astronomy sectors in the respective geographical areas (Appendix 6: 283). Thorough deliberations came about in response to probing questions about their observations and perceptions of the contributions of astronomy towards the tourism industry. Figure 15 illustrates the participating stakeholders in the tourism and astronomy industry.

Figure 15: Industry Stakeholders



Source: Researcher' own construction

Depending on the expertise of the participant, the open-ended questions allowed for flexibility in the context of their knowledge, background and experience. This meant that the responses varied depending on the organisation, designation and field of interest, which added invaluable inputs to the study's findings (Saunders *et al.*, 2012). To ensure the anonymity of the industry stakeholders, their respective positions within the organisations have not been specified. The participating organisations are indicated in Table 12.

Table 12: Sample and codes of participating stakeholders

CODES	ORGANISATION
ST1	Open Africa
ST2	Open Africa
ST3	SKA South Africa
ST4	McDonald Observatory / Bash Visitors Center, University of Texas at Austin
ST5	South Africa Astronomical Observatory
ST6	Turismo Astronómico Chile
ST7	Hospitality Technology International
ST8	University of the Witwatersrand
ST9	Big Blue Productions

Source: Researcher's own construction

5.6.1.5 Stakeholder engagements (n=11)

In addition, qualitative data was also collected from various engagements with the stakeholders at the various platforms. These stakeholder engagements enabled the researcher to obtain exclusive information and build networks with related role-players. The researcher actively participated in the following stakeholder engagements by making field notes and obtaining the official minutes of the meetings (secondary data). The schedule of the stakeholder meetings is indicated in Table 13.

Table 13: Stakeholder engagements

CODES	STAKEHOLDER ENGAGEMENT	SCHEDULING
MT1	SKA Cluster on Sustainable Development and Poverty Alleviation meeting	19 March 2013
MT2	SKA Working group meetings	4 meetings per annum: 2014, 2015, 2016
MT3	SKA Social Responsibility Programme Due Diligence	14-15 August 2014
MT4	Deputy President visit to SKA	27-28 February 2015
MT5	SKA and AVN Coordination Meeting	19 August 2015
MT6	Science Forum South Africa	8-9 December 2015
MT7	Northern Cape Stakeholder meeting	18-October 2016
MT8	Northern Cape Route Cluster Meeting	11-12 October 2016
MT9	Workshop for Karoo Central Astronomy Advantage	20 January 2016
MT10	SKA Science Visitor Information Task team	22 August, 19 October, 1 December 2016
MT11	Central Karoo Route Chapter meeting	17 November 2016

Source: Researcher's own construction

5.6.2 Pre-testing

Prior to launching the research instrument, a pre-test was undertaken among six individuals whose profile fitted those of the target population. It offered the chance to measure the effectiveness and weaknesses of the questionnaires. Refinement was improved to ease the answering of questions and to determine whether the questions were unambiguous (Leedy & Ormrod, 2014; Saunders *et al.*, 2012), thereby attesting to the adequacy of instructions to respondents (Bryman, 2012). The six stakeholders were randomly selected from the database and during this process the following flaws were identified:

- Spelling and grammatical errors;
- Layout of questions did not flow sequentially in relation to the context; and
- The Likert scales were confusing and not reader friendly.

The researcher adhered to the feedback from the pilot study and made the necessary adjustments. The Likert scales were formatted to range from 1 as 'very important' to 4 as 'not important at all' (Question 14) and from 1 as 'very satisfied' to 4 as 'not satisfied at all' (Questions 15 and 18). The completion of the questionnaire took approximately five to 10 minutes, which was deemed to be a suitable time allocation.

5.6.3 Fieldwork Challenges

Challenges were inevitable with regards to the empirical data collection process. Firstly, due to the vastness and isolated geographical area of the Karoo, the researcher found it difficult to visit the region frequently. The researcher collected insufficient data after visiting the study area on numerous occasions, thus the main source of error in the data collection was a low response rate (Mouton, 2001). The Northern Cape Province is perceived as one of the least visited provinces in South Africa, which means low tourist participation was expected. However, with the Karoo not having a visitor information centre, it was made even more difficult to reach an acceptable number of tourists. In order to resolve the problem and obtain sufficient data, the researcher conducted additional fieldwork by making use of an online survey to increase the response rate as discussed under the section of Quantitative Data Sampling (page: 125). The researcher also attempted to recruit fieldworkers from the local communities to increase the number of participants, stating that remuneration would be awarded for each questionnaire completed. However, this was unsuccessful, which once again, resulted in the researcher returning to the field on numerous occasions.

Secondly, it was also very challenging to arrange focus groups with the communities as the local municipalities were unable to gather groups for this specific purpose. The reason stemmed mainly from the notion of estrangement between local municipalities and the community members. The ensuing poor relationship led to a poor response to requests to participate in the research.

Lastly, the assumption was that the tourism business owners could complete the questionnaire in English, but there were numerous requests to translate the questionnaire into Afrikaans. The error factors identified in the data capturing process continued in respect of the number of missing values as some of the questionnaires were incomplete. The response rate remained poor (Mouton, 2001).

5.6.4 Qualitative Data Analysis

After the fieldwork was concluded, the collected data was categorised and sorted so that it could be captured and analysed accurately (Mouton, 2001:108). Data analysis had already commenced while the interviews were underway and this allowed the researcher to redesign questions and initiate follow up questions to dig deeper into the central themes while the interviews were continuing (Mouton, 2001:198). Parallel data collection and capturing assisted in hastening the data analysis process.

The interviews were recorded by an audio-recorder and then transcribed. Transcription is the written or word-processed account of the actual interview. Notes were also made to capture non-verbal responses, such as any actions observed and reflections on all the focus groups and all the interviews held during the data collection stage of the research (Saunders *et al.*, 2012). This enabled the researcher to discern the emotion lying behind the responses provided. The scribing template of the researcher included the actual transcript, the time and date, the participants' details, reflective notes and observations and the codes developed. Using deductive inference, also called analytic induction, the researcher started to collect the data and then follow up on the common themes, thereby having a small number of examined cases from which to generalise to a larger population of similar cases (Mouton, 2002; Mouton, 2005; Saunders *et al.*, 2012).

After the interviewing process was completed, the computer-aided qualitative data analysis software, ATLAS.ti, was used capture and code the qualitative data collected from all the interviews, the focus group sessions and the stakeholder engagements. This formal analysis provided additional themes and concepts that created an overall explanation of the phenomena. The researcher interpreted the categorised or themed data to formulate the framework (Mouton, 2001:198-199). According to Saunders, Lewis

and Thornhill (2012) and experienced by the researcher, the ATLAS.ti CAQDAC programme, was found most adequate because of the following reasons:

- It has the ability to store and provide connections between all the data files within the research study;
- it provides instant access to all the data, once it has been captured;
- The text search tool is available to retrieve specific data within a context;
- The researcher has the ability and freedom to code and recode data and form themes and relationships between variables and outputs;
- ATLAS.ti is deemed to be an effective method to organise all the data;
- The system provides for comments and note taking in relation to the data and its coding; and
- Output of all the data allows the researcher to export it into other applications, such as word processors and excel in order to create tabular illustrations.

5.6.4.1 Qualitative Data Coding Process

For the various forms of qualitative data, initial coding or open coding was done to unify and categorise the relevant themes. The data collected was disaggregated into conceptual units with their related labels. This was a process that commenced without the basis of existing theory. There are three main sources used in this study from which labels were derived for codes. Firstly, labels were extrapolated from terms that emerged from the data, secondly, labels were based on actual terms used by the participants that are also known as in 'vivo' codes and lastly, the labels were drawn from existing theory and previous literature (Saunders *et al.*, 2012).

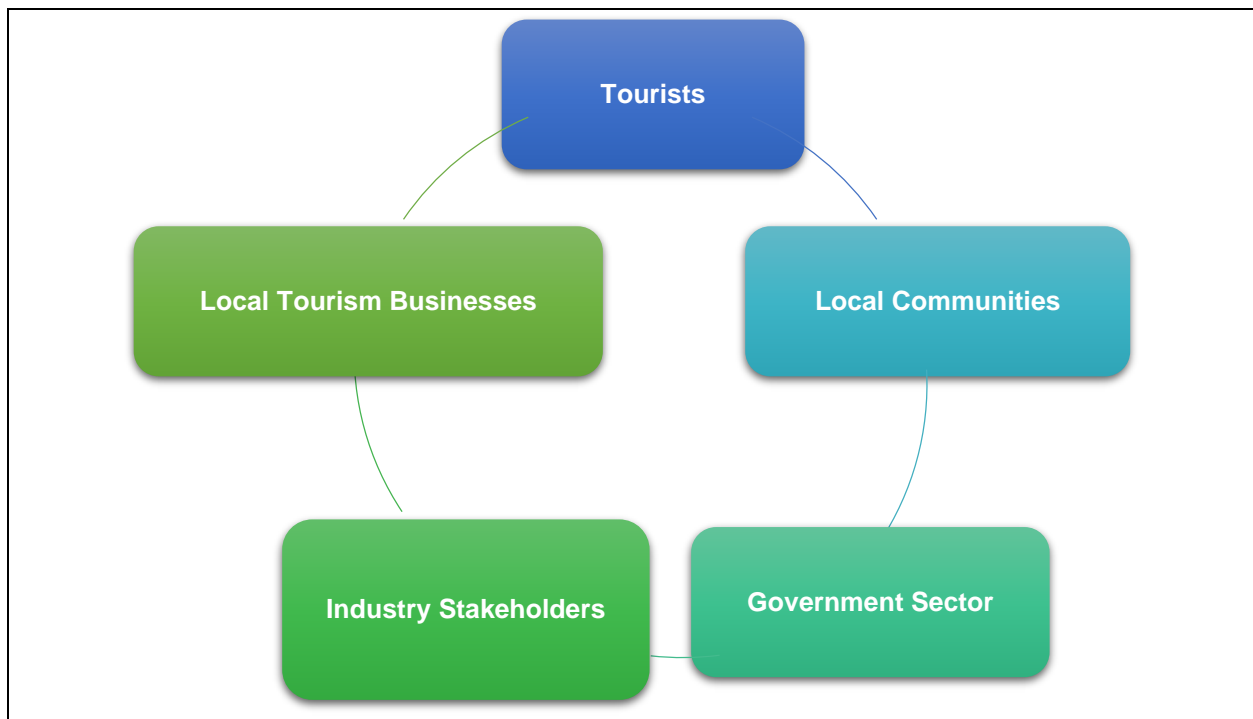
Axial coding refers to the process of looking for a relationship between the categories of data that have emerged from the open coding. This process indicated a process of theoretical development from primary data sources. As relationships between categories began to be recognised, they were rearranged further into a hierarchical form with the emergence of subcategories. Once these relationships were identified, it was verified

against the actual data collected. This process was imperative for data analyses as it explored and described real life phenomena (Saunders *et al.*, 2012).

5.7 QUALITY AND RIGOUR OF THE RESEARCH DESIGN

In this study, a variety of instruments was used to collect data. The quality assurance of the data was ensured through triangulation and crystallisation. Crystallisation refers to validating a variety of data collection methods to establish whether the findings from one method equally validated the findings of another method (Mouton, 2002; Saunders *et al.*, 2012). For triangulation to prove reliable, the data was verified so that the conclusions based on qualitative sources were supported from a quantitative and a theoretic perspective. Triangulation was significant for the interpretative validity of the research data, as it established the trustworthiness of the data (Maree, 2007). The application of the triangulation process is depicted in Figure 16 below.

Figure 16: Application of Triangulation



Source: Researcher's own construction

Lincoln and Guba (1985) proposed the criteria of credibility, dependability, confirmability and transferability, which verify and assure the quality of the research data (Houghton, Casey, Shaw & Murphy, 2013; Maree, 2007). It was important that the results of this study remained consistent, even when the data received was from different data sets from a variety of instruments. Consistency between the results from different sets of data ensured that the results were reliable and therefore dependable. Validity affirms the way in which the phenomena were explained and match the reality. To ensure that the research instruments were credible, all the instruments were reviewed by experts and brought before the University's Ethics Committee, thereby ensuring internal validity. The interviewees for this study were selected on grounds of their experience, professional expertise or advance knowledge about the subject under investigation to make certain that the data collected were of the highest credibility. The credibility of the qualitative research was enriched through the "... development of an early familiarity with the participants and the participating organisations, but also through well-defined, purposive sampling, detailed data collection methods and triangulation" (Maree, 2007:123). Transferability presented the researcher with the opportunity to make connections between theoretical themes, the participants' experience and the research findings. Dependability was demonstrated by the evolution of the research design, its implementation plan and the operational element of the data gathering process. Confirmability was grounded in the degree of objectivity attained and the extent to which the findings of the study were portrayed by the participants and not the bias, enthusiasm, or personal interests of the researcher (Maree, 2007).

During this research study, it was always a matter of concern as to whether the researcher would reveal information and compromise the quality of the research findings. In this respect, there are three types of bias to consider, namely, interviewer bias, interviewee or response bias and participation bias. Interviewer bias relates to potential bias from the researcher through verbal tone and non-verbal behaviour when the participant responds to the questions asked (Saunders *et al.*, 2012). It was also possible for the researcher to demonstrate bias during the data analysis process, therefore, it was important for the researcher to trust the information provided and to trust the data. The second form of bias is the interviewee's or response bias. This type of bias may be caused by the opinion the

respondent has of the interviewer, as a result of participating in interviews through an invasive process. This is especially true when the data collection includes semi-structured or in-depth interviews where an explanation for answers is sought. The interviewees may be willing to respond, but might be aware of the sensitivity surrounding an issue and the potential consequences of their inputs. Therefore, interviewees chose what they wanted to reveal as it potentially leads to further follow up questions by the researcher. Participation bias runs the risk of occurring as result of the nature of the individuals who agree to be interviewed and form part of the research study (Saunders *et al.*, 2012).

The researcher used her personal understanding of the theory and practice of the field of study in conjunction with inductive reasoning to identify the themes and interpret the data. As stated before, the researcher was an active stakeholder in the field of research and, by so doing, added value to the empirical data that was collected. The researcher's knowledge of, and experience in the field of tourism development in rural areas contributed towards greater insight into the complexities pertaining to the position and points of view of the various stakeholders involved (Saunders *et al.*, 2012).

5.8 RESEARCH ETHICS

Ethics were carefully considered. It was important for the research process as the goodwill of the participants equipped them to provide data as accurately as possible (Wilson *et al.*, 2009). Trust was important as the researcher was responsible for gathering data in a professional manner and ensuring that the interviewees' honest opinion was valued and respected. The principles of privacy and discretion were adhered to so that the participants' views and opinions were used in a confidential manner (Wilson *et al.*, 2012). In the conduct of this study, the researcher strived to maintain objectivity and integrity and not, under any circumstances, alter any data or observations. During the recording of the data, the researcher disclosed the methodology and techniques of all the analyses. After all the analyses had taken place, the raw data and relevant documentation that were collected and prepared, would be available to other scientists and interested persons, except where issues of confidentiality and privacy might be violated. In presenting the work, the findings will be presented meticulously and without

misrepresentation of the results in any form. All the details of the research theories, methodologies and design were fully disclosed, which enabled the interpretation of the research results (Mouton, 2001).

The researcher ensured that the participants were briefed as to why their participation was regarded as being exceptionally important. The researcher informed the participants about the purpose of the study and the amount of time the interview and questionnaire would take. With regards to ethical publishing practices, the study made appropriate reference to all the contributions made by all the participants who made the research possible. The researcher acknowledged all the sources that were consulted, both directly and indirectly, as well as those who had added a significant contribution to this study. This study was heavily reliant on a sound relationship between the researcher and the participants and, therefore, being accountable was important. This study relied mainly on public funding, thus accountability regarding the progress made was crucial as was the obligation to conduct this study in a socially appropriate and accountable manner (Mouton, 2001).

5.9 CONCLUSION

This chapter described the methodological path and data collection process that was applied in the study. In summary, the methodological path was guided by an interpretative approach, by defining the case study and following both quantitative and qualitative research methods. The quantitative research analysis was especially relevant in procuring the exploratory data and findings on the trends and patterns of tourists visiting the selected rural Karoo towns surrounding the SKA and SALT astronomical projects. The qualitative data analysis brought to light the perceptions and expert opinions of the key stakeholders, and the methodology served the study exceptionally well, because it provided the study with an in-depth understanding of a real world problem.

The research findings derived from the data analyses and how a real world problem could be addressed through a collaborative approach, will be discussed in Chapter 6. A proposed framework for the sustainable development of Astro Tourism routes in a rural context will also be presented as result of the research process that was followed.

CHAPTER 6: RESEARCH RESULTS AND DISCUSSION

6.1 INTRODUCTION

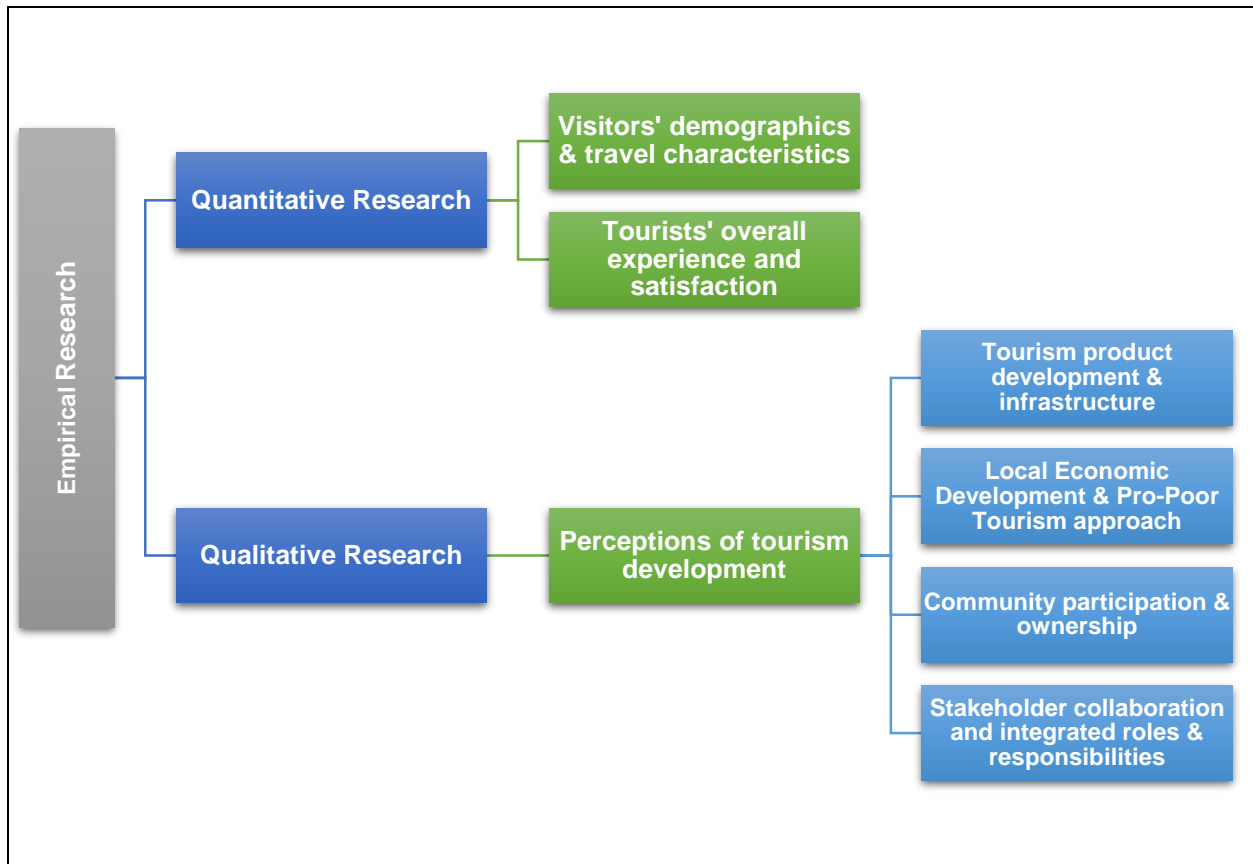
This chapter presents the results and findings related to the following empirical objectives of this study which are:

- **Objective 4:** To determine the demographics and travel characteristics of visitors to the towns selected in the Karoo in the Northern Cape Province;
- **Objective 5:** To investigate the tourists' overall perceptions and experience of the destination using an Importance-Performance Analysis (IPA);
- **Objective 6:** To determine stakeholder perceptions of tourism development in respect of Astro Tourism activities in the region of the case study in relation to tourism product development and infrastructure; local economic development and the Pro-poor tourism approach; community participation and ownership; stakeholder collaboration and integrated roles and responsibilities.

The empirical objectives were addressed through both the quantitative and qualitative research analysis processes. As explained in Chapter 5, a collaborative and consultative approach was followed by including all the affected role players in this research process using various research instruments. This chapter presents the results of the respective quantitative and qualitative data that was collected, with the specific aim of triangulating the research findings from the two data sets. This chapter also discusses the PESTEL and SOAR Analysis of the Karoo region as a potential Astro Tourism destination.

An overview of the flow of the content in this chapter is depicted in Figure 17.

Figure 17: Layout of the empirical research results



Source: Researcher's own contribution

6.2 QUANTITATIVE RESEARCH ANALYSIS

The demographics and travel characteristics of the responding tourists are discussed in the following sections.

6.2.1 Demographics and Travel Characteristics

Objective 4: *To determine the demographics and travel characteristics of visitors to the towns selected in the Karoo in the Northern Cape Province*

The demographics and travel characteristics of the responding tourists are depicted in Table 14. Of the tourists participating in the study, 96.9% were domestic tourists travelling from inside the borders of South Africa. Of the domestic travellers, the majority were from

the Western Cape Province, followed by KwaZulu-Natal, Gauteng, and the Northern Cape Province. The international visitors originated from the United Kingdom, Germany and Zimbabwe. The results also include the completed semi-structured questionnaires completed by representatives from the McDonald Observatory in Chile, South America. Recorded visitor statistics in Chile have shown that majority of their received market were also domestic travellers (72.1%), followed by those from the United States (17.1%), Brazil (14.3%), Germany (13.1%) and United Kingdom (9.1%). It is important to note that the majority of tourists visiting the Karoo were domestic visitors. The reason being that despite the international nature of the astronomy project, the astro physicists, engineers and technicians, who are employed, are drawn predominantly from the South African labour force. The field of astronomy is also predominantly based on advanced technology so that data can be obtained remotely, more specifically, at the SKA Head Office. In the case of SKA and SALT, the South African Astronomy Observatory (SAAO) and SKA Head Offices are based in Cape Town. Cape Town with an international airport, allows for easy and quick access to the head offices' data resources and the relevant contact persons associated with the project as well as serving as the hub where the data are processed, interpreted and analysed. Cape Town is also a huge draw card for tourists as it offers a wide variety of tourism attractions and amenities. However, the popularity of Cape Town, as a tourist destination, has not benefitted the tourism industry in the Karoo, as it is not experiencing an increase in the number of international tourists, as was anticipated.

Table 14: Demographics and travel characteristics of the responding tourists (n=130)

VARIABLE	FREQUENCY	PERCENTAGE (%)
Gender:		
Male	62	53.4%
Female	54	46.6%
Origin of region:		
Domestic	126	96.9%
International	4	3.1%
Origin of international visitors		
United Kingdom	2	1.5%
Germany	1	0.8%
Zimbabwe	1	0.8%
Origin of domestic visitors		
Western Cape	46	36.2%
KwaZulu-Natal	31	24.2%
Gauteng	22	17.3%
Northern Cape	10	7.9%
Eastern Cape	7	5.5%
Mpumalanga	4	3.1%
Limpopo	4	3.1%
Free State	2	1.6%
North West	1	0.8%
Age (years):		
< 20 years	8	6.3%
21-30	17	13.4%
31-40	21	16.5%
41-50	17	13.4%
51-60	35	27.6%
>60 years	29	22.8%
Education levels		
Primary and Secondary school	31	27.2%
College	3	2.6%
Tertiary level	52	45.6%
Postgraduate level	28	24.6%
Number of visits		
First Visit	81	62.8%
Return visit	48	37.2%
Length of stay		
Day visitor	11	8.6%
1 night	35	27.3%
2-3 nights	73	57%
1 week	6	4.7%
2 weeks	2	1.6%
1 month	1	0.8%
Travel group composition		
Family and friends	64	42.3%
Student group	17	13.1%
Alone	13	10%
Business associates	13	10%
Astronomy Club	12	8.5%
Tour group	11	6.9%

Main reason for visit		
Leisure	57	43.8%
Science	31	23.8%
Business	22	16.9%
Education	16	12.3%
Visiting Friends and Relatives	2	1.5%
Academics	1	0.8%

Source: Researcher's own contribution

The majority of travellers to the region were first time visitors (62.8%) who were influenced to visit the region by word of mouth recommendations (45.2%), astronomy interest groups (12.1%) and schools or tertiary institutions (10.5%). Fifty-seven percent of visitors stayed an average of two to three nights, followed by those who only stayed for one night (27.3%) and day visitors who were passing through the respective towns or the Karoo area (8.6%). Day visitors indicated that they drove from the other towns, namely, Calvinia, Richmond, Upington, Prieska and Beaufort West. None of the respondents stayed for longer than three nights. The short stay spent by astronomy interest groups and student groups in the region was unexpected, but was largely due to three factors. Firstly, the short distance between Cape Town and Sutherland makes it possible for visitors to drive in and out of the region frequently, and consequently, spend a shorter time in the Karoo. Leisure travellers, such as those travelling with friends and families, use the opportunity to make a quick weekend-away trip, rather than longer vacation stays. Secondly, the distance to Carnarvon is longer and a bit more difficult to reach, as the condition of the road is problematic, thereby, making the town less accessible and less appealing. Finally, the Karoo towns do not have a variety of quality tourism attractions and amenities to entice the wider international and domestic tourist market to stay for longer periods of time. The composition of the travel groups, consisted predominantly of those travelling with friends and family (49.2%), followed by those who travelled with a tour group (13.1%), with an astronomy interest club (9.2%), alone (10%), with business associates (10%) and as part of a student group (8.5%).

With regards to the visitors' choice of accommodation establishments, visitors chose to stay overnight at hotels (32%), guesthouses (28.1%), self-catering units (19.5%) and B&B's (12.5%). Visitors made use of their own vehicles (55%) to travel in the Karoo region, followed by those who travelled by tour buses (18.6%) and by rental vehicles

(14.7%). The main purpose for visiting the respective Karoo towns was leisure 43.8%. Thirty-seven percent of respondents indicated that they visited the region for scientific, educational and academic reasons, all of which related to astronomy, followed by those who travelled for business (16.9%) and visiting friends and relatives (1.5%). Sixty-eight percent of the respondents indicated that astronomical activities were their primary activity during their visit.

The astronomical activities included tourists visiting SALT in Sutherland (44%) and SKA in Carnarvon (17.9%) as well as general star gazing activities at the various establishments that offered sky gazing and stargazing experiences (38.1%). Of those who did not partake in any astronomical activities during their visit to the region, 47.4% indicated that they had no time whilst being in the region, whilst 21.1% were not aware of any astronomical offerings available. Other activities that visitors actively enjoyed were the cultural and heritage offerings (30.1%), touring around in the Karoo (25.8%) and participating in adventure and outdoor activities (17.2%). Other activities mentioned were business related activities, attending events, agricultural activities and travelling to observe the natural landscape of the Karoo.

Resulting from the qualitative research analyses, the various participants provided the researcher with their observations about the tourists visiting the Karoo region. These observations concur with the quantitative data collected from the visitors themselves. Participants verified that visitors were predominantly retired and middle aged couples. Visitors also included astronomy scholars and interest groups who visited the area to specifically experience the telescope at SALT. In addition, tourism businesses indicated that some of the visitors were photographers and film makers who captured the picturesque celestial landscape of the Karoo. As the Karoo is marketed for its rustic authenticity and untarred roads, it poses an attractive adventure for driving 4x4 vehicles, mountain bike riding and hiking. It was noted by both the local communities and the tourism businesses that visitors especially sought after the quietness and tranquillity of the Karoo. The vast semi-desert countryside has become a niche market enjoyed by adventurers.

6.2.2 Tourists' Overall Experiences of the Destination

Objective 5: To investigate the tourists' overall experience of the destination using an Importance-Performance Analysis (IPA)

The Importance-Performance (Satisfaction) Analysis (IPA) was conducted to assess the weaknesses, strengths and impact of the tourism product offering in the respective towns based on the experiences of the visiting tourists. Respondents had to rate specific features of the destination in terms of its importance as well as their satisfaction level thereof. Ratings were indicated on a four-point scale (1 = very important, 4 = not important at all; 1 = very satisfied, 4 = not satisfied at all).

For this analysis, the mean scores were used to test the gaps between the expectations (levels of importance) versus satisfaction (level of performance). Paired sampled *t*-tests were used to determine the statistical significance of these relationships. The results are indicated in Table 15.

Table 15: Importance-Performance (Satisfaction) Analysis

TOURISM FEATURE		N	MEAN	STD. DEVIATION	t	Sig.
Pair 1	Importance of Roads	129	3.43	.635	3.216	.002
	Performance of Roads	129	3.16	.667		
Pair 2	Importance of Attractions	124	3.10	.719	1.614	.109
	Performance of Attractions	124	2.96	.617		
Pair 3	Importance of Rest Stops	125	3.41	.597	6.327	.000
	Performance of Rest Stops	125	2.91	.622		
Pair 4	Importance of Information	116	3.15	.826	4.751	.000
	Performance of Information	116	2.61	.695		
Pair 5	Importance Signage Attractions	122	3.59	.627	7.576	.000
	Performance Signage Attractions	122	2.94	.647		
Pair 6	Importance Signage Towns	123	3.50	.670	4.893	.000
	Performance Signage Town	123	3.11	.612		
Pair 7	Importance Accommodation	123	3.54	.576	4.659	.000
	Performance Accommodation	123	3.18	.628		
Pair 8	Importance of VICs	111	3.17	.737	4.907	.000
	Performance of VICs	111	2.66	.732		

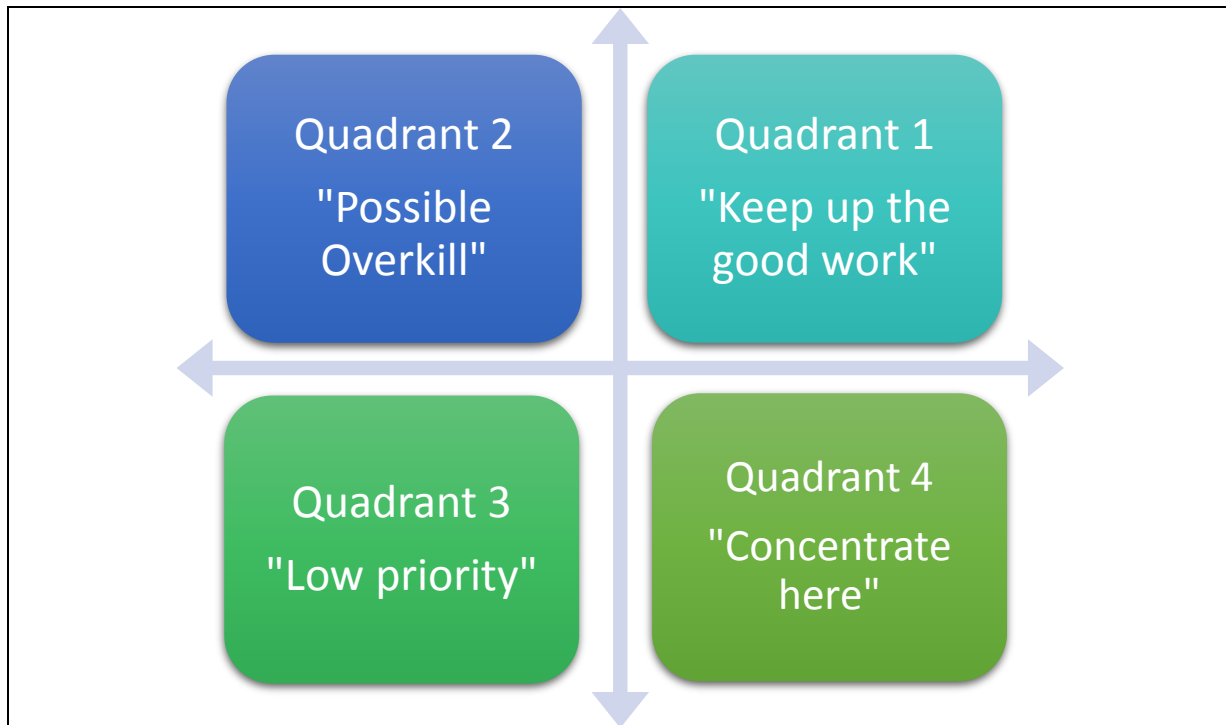
Source: Researcher's own contribution: [* p < 0.05]

As seen in the table, the pair with the greatest IPA gap, based on the mean scores, was pair 8 in respect of their perceptions in terms of the visitor information centre (VIC). This is due to the fact that the satisfaction level of visitor information centres received the lowest average score compared to its level of importance. Only one factor, namely Pair 2, did not have a significant relationship, thereby indicating an overall negative discrepancy between the visitors' expectations and the performance of the destination.

The means from the paired analysis were used to determine the values for the grid. According to the Martilla and James' (1977) grid, the average of importance and satisfaction (performance) divides the matrix into four quadrants. The attributes in quadrant 1 reflect both importance and satisfaction, which are the strengths of the destination and can be interpreted as *'keep up the good work'*. Quadrant 2 is where the level of satisfaction is high but the importance or relevance is low, which implies that resources are being wasted and that the management is undertaking *'possible overkill'*. It is, thus, important that the resources that are wasted be relocated to where they can be better utilised on relevant destination development initiatives. Quadrant 3 demonstrates the *'low priority'* attributes as it rates low in both importance and satisfaction. These attributes are perceived as minor weaknesses to be considered for improvement at a later stage. Quadrant 4 attributes are those that are considered as very important, but received a very low satisfactory rating. Thus, these attributes are indicative that management should prioritise the improvement of these features as a matter of urgency and commitment and the message is *'concentrate here'*.

Figure 18 depicts the interpretation of the quadrants of the IPA grid developed by Martilla and James (1977) which indicates the remedial action required for the related quadrants.

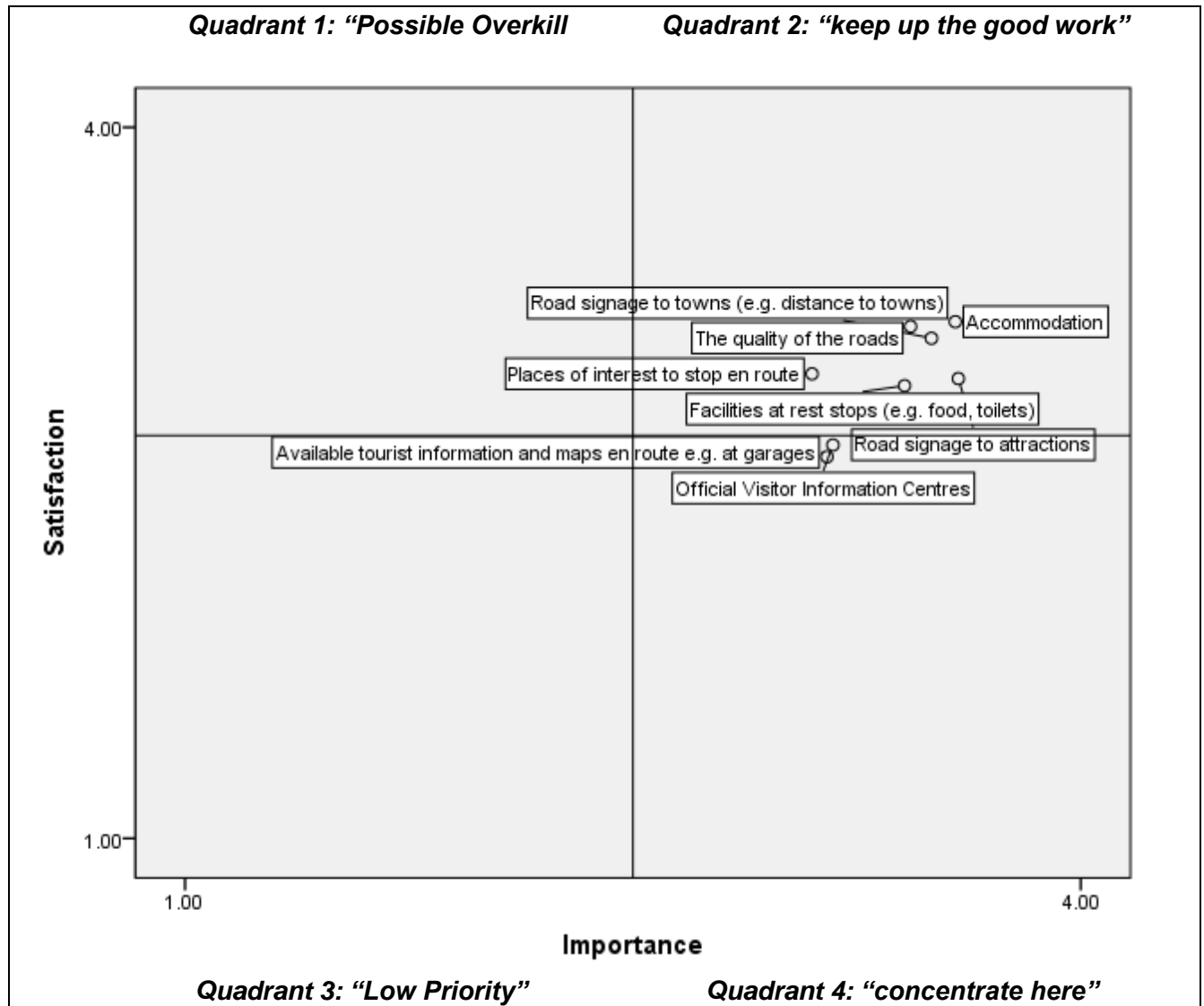
Figure 18: Importance-Performance (Satisfaction) Grid



Source: Martilla and James (1977) (adapted by Maumbe & Van Wyk, 2011)

The results from the IPA showed some notable gaps between the importance of specific features of the destination compared to the satisfaction level of these attributes. Figure 19 presents the populated grid that was obtained from the data collected in respect of the participants' views of importance versus performance (satisfaction) of the key tourism offerings and services rendered during their visit. As shown, most of the features' ratings placed them in the top right corner of quadrant 2, '*keep up the good work*', which indicates both a high importance and satisfaction level. The only feature that appeared in the bottom right corner of quadrant 4, '*concentrate here*', is the low level of satisfaction in respect of available tourist information and maps on-route, which is a clear indication that there are no VICs in the various towns.

Figure 19: Importance-Performance (Satisfaction) Grid application



Source: Researcher's own contribution

The respondents were asked via an open ended question to share their most negative and most positive experiences during their visit. With regards to the negative experiences, almost 40% indicated that bad road conditions were the most unpleasant part of their trip. This included poor road infrastructure as well as the number of speed traps, potholes and bad and unmaintained gravel roads. It is necessary to provide further clarification when making comparisons between the negative road related conditions experienced by tourists and the IPA grid. The tourists as well as the local communities stated that they did not mind the fact that access roads to tourist sites were gravel roads as they provided

an authentic and “off the grid” experience, which they enjoyed, as evidenced in Figure 20, below. The negative experience was, in fact, mostly associated with poor maintenance of the roads, which made driving difficult when driving a normal or light weight vehicle. The negativity expressed by visitors referred specifically to the road between Sutherland and Fraserburg and the partial gravel road between Fraserburg and Williston.

Figure 20: Gravel road within the respective Karoo area



Source: Researcher’s own construction

As astronomical activities are mainly dependent on clear dark skies, unpleasant cloudy weather can interfere with star gazing and other Astro Tourism activities. Some visitors indicated that their experience was spoilt by the extreme cold and cloudy weather. Visitors also viewed the absence of information offices at the tourist sites negatively, while many highlighted the neglected condition and lack of maintenance at some of the tourist attractions and expressed disappointment that there were no decent curio-shops to purchase souvenirs and gifts.

On the positive side, some visitors indicated that their most positive experience was visiting the SALT. They found that the scenery, tranquillity of nature and beautiful towns were most enjoyable. Others said that their most positive experience was the welcome accorded to them by the local communities in the Northern Cape Province. Some were very complimentary about the excellent and friendly service received from the tour guides and staff at the SALT. Other positive experiences mentioned by visitors included the unique local cuisine, the SKA and their experience of snow in Sutherland.

In spite of the potential for these towns to attract tourists, the fact is that local municipalities may not have the funding to maintain the roads, which carries negative implications for tourism development. These rural areas may have positive attributes and experience beautiful winters, but if the roads are wet and muddy, they become extremely dangerous, which together with dark and foggy conditions, any attractions that the region holds can pall.

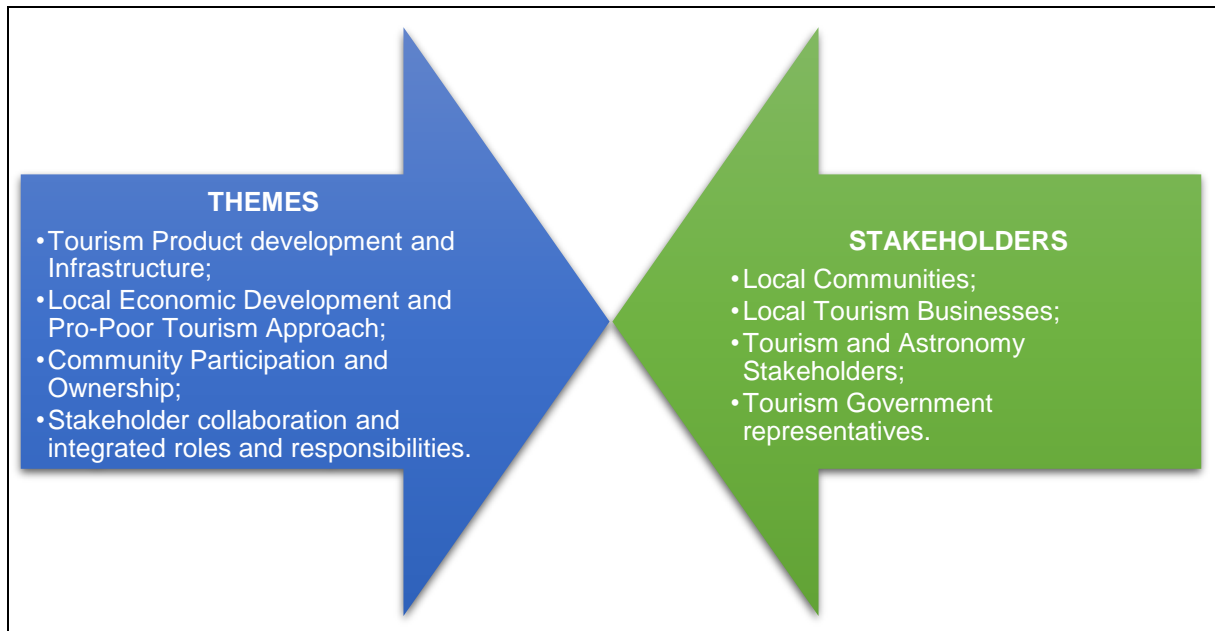
Respondents were asked to indicate their level of overall satisfaction on a five-point scale from very dissatisfied to very satisfied. Eighty-five percent (85%) of the visiting tourists indicated that their time in the Karoo region was satisfactory. Four percent (4%) of the respondents indicated that they were fairly dissatisfied and one percent (1%) was very dissatisfied with their trip. When asking whether they would recommend others to visit the respective Karoo towns, almost 90% of the visiting tourists indicated that they would recommend a trip through this region to others. When asked whether it would be likely that they return to the region, the majority (67.7%) were unsure. A further 9.2% indicated that they would return to the next event or festival and 6.2% would return during the following school holiday.

6.3 QUALITATIVE RESEARCH ANALYSIS

Objective 6: *To determine stakeholder perceptions of tourism development in respect of Astro Tourism activities in the region of the case study in relation to tourism product development and infrastructure; local economic development and the Pro-Poor Tourism approach; community participation and ownership; stakeholder collaboration and integrated roles and responsibilities.*

The empirical objectives of the qualitative research component were to determine the different stakeholders' perspectives and their involvement in sustainable Astro Tourism route development. These views and perspectives are presented in this section. The qualitative analyses formed a firm foundation on which to develop a framework that critically highlights the potential of Astro Tourism as a means of contributing towards sustainable rural tourism development. The discussions emphasised the impact of sustainable Astro Tourism route development on the economy and the social and environmental aspects of the respective geographic areas. All the data received from the four stakeholder groups were discussed according to the relevant sub-objectives that emerged from the theoretical foundation, namely, tourism product development and infrastructure, local economic development and the Pro-Poor Tourism approach, community participation and ownership, and stakeholder collaboration (Figure 16, p. 170). Furthermore, the attractiveness of the Karoo as an Astro Tourism destination, and the economic beneficiation of rural development through astronomy, together with the various stakeholders' roles and responsibilities, was examined. A summary of the findings and main concepts emerging from the qualitative data will be presented in Table 18 (p. 176) at the end of this chapter. Figure 21 below illustrates the relationship between the theoretical foundation and the participating stakeholders.

Figure 21: Participating stakeholders according to the theoretical foundation and sub-objectives



Source: Researcher's own construction

6.3.1 Tourism Product Development and Infrastructure

The following sections discuss the responses relating to tourism product development and infrastructure according to the collective results obtained from the in-depth interviews, the semi-structured questions and the focus groups.

6.3.1.1 Conditions of general infrastructure

Respondents ST6, NAT3 and DIS1 indicated that suitable infrastructure for tourists, such as observatories, accommodation, good roads and signage are key aspects if destination development is to succeed. All the focus groups, COMM1, COMM2, COMM3, COMM4 and COMM5 found that the Karoo towns receive visiting tourists who drive through and spend the day in the respective towns, not necessarily staying overnight. Despite the small number of tourists, these drive-through visitors contribute towards the economic development of the rural towns and also play a role in sustaining the local tourism industry. Due to the location of the SKA, community members stated that the road was tarred between Vosburg and Carnarvon, thereby, making an enormous contribution to the ease of travel to the SKA site as well as travelling between the towns. Improvements to

this infrastructure made the travel experience between these towns much more comfortable and led to an increase in the number of visitors. The upgrade of the roads also contributed towards service providers having easier accessibility to the core of the SKA in Carnarvon as the travelling distance was shortened by 100kms. The community members' representing all the participating towns felt that this was one of the most valuable contributions made to the Karoo region by the SKA.

NAT3 also mentioned that the SKA had contributed additional crucial infrastructures, such as road improvements, power lines, fibre and the refurbishment of buildings. On the other hand, COMM4 indicated that long distances, accessibility and the bad conditions of the gravel roads remained a challenge for local communities. In terms of infrastructure development, tourism businesses TB3 and TB12 also mentioned that the roads between Sutherland and Fraserburg and the roads from Fraserburg to Williston and Carnarvon, respectively, urgently need to be tarred in order to increase accessibility to these towns. Respondent DIS2 said that the upgrading of the tourism infra- and suprastructures are imperative for the development of destinations, which is in accordance with the recommendation made by Kovács and Nagy (2013). Stakeholder ST6 also mentioned that the region is further challenged by insufficient directional road signage. The towns in the Karoo region are a driveable distance from urban cities, but the roads and directional signage need to be improved to maintain the sustainability of route developments. Respondent NAT1 advised that local municipalities should prioritise bulk infrastructure development, upgrade key access roads with lamp posts on the roads between Sutherland and Fraserburg, Fraserburg and Williston and between Sutherland and Williston. Visible road direction signage should be in place and consistent maintenance of the historical buildings is necessary. The infrastructure issue is extremely important as the distance between towns and the condition of the gravel roads have an enormous effect on the movement of tourists as do the bad conditions on some parts of the roads, where poor maintenance actually discourage self-drive tourists from visiting the area. As a result of the poor maintenance of the roads and poor maintenance of historic buildings, the management of tourism businesses are pleading with local municipalities to provide sufficient and ongoing maintenance of the roads as well as to maintain the existing museums.

6.3.1 *Tourism facilities and destination management*

The tourism businesses relayed their concern about the importance of information sharing and the maintenance of the attractions in the Karoo. Many of the museums have no site managers and are closed most of the time. This reduces the length of stay of visitors and prevents them from experiencing the historical heritage of the indigenous folk. Some of the towns do have a few museums, but this is not sufficient for domestic and international tourism consumption. Furthermore, although museums are present, respondent ST9 and the local communities mentioned that bad management and the operational hours are problematic. Many visitors and locals want to visit these cultural sites, only to find that the facilities are inaccessible.

Another reason as to why these attractions are not maintained and are without site management is because there is no tourism association overseeing the region. Such a tourism association would arguably create an enabling environment where holistic tourism services and offerings are on a par. A united tourism body is required to share information with local municipalities about the developmental effects of the SKA and SALT on the local tourism sector. It is the responsibility of local municipalities to allocate funds and supply the required supporting structures for the development of tourism in the respective regions. However, if funds to support these structures are not available, another challenge comes to the fore. Local community representatives in COMM1 stated that tourism could grow, if the local municipality together with the local tourism industry would, for example, host events such as star-gazing festivals. The representatives corroborated the need to establish an effective tourism association. All the representatives of the local communities expressed concern about the lack of sport and recreational facilities for the youth and local communities.

6.3.1.3. *Tourism development within the region*

When asking the focus groups whether tourism can grow, all indicated positively that it can indeed grow, based on a number of conditions. The majority said that the Karoo is ideal for domestic travellers, especially South African families. Families are drawn to the

quietness of the area and the tourism offerings are still affordable for the domestic market. This confirms the statement by stakeholder ST3 that “... *the Karoo should be kept as a low density population area so that it retains its status as a quiet area*”. The SKA and SALT are also draw-cards for visitors to the Karoo and tourism businesses have clients who are scientists, technicians, engineers and academics that work and study at these astronomy sites. During the in-depth interview with respondent NAT1, it was noted that the SKA is a project that has global significance and is visited by high profile individuals, such as political dignitaries, members of royal and noble families as well as celebrities. For this reason, accommodation in Carnarvon needs to be of the highest quality. A presidential suite should be available to cater for these personalities and encourage them to stay over in a small rural town and not just fly in and out without any impact on the destination. The proposed science visitor centre in Carnarvon will “... *definitely capture a certain market share of the tourism industry and specifically those with interest in the SKA project*”, respondent SK3 stated.

A respondent from the tourism businesses, TB17, suggested that tourist friendliness regarding astronomy can be improved by:

“... adding a small planetarium or cinema or just more resources such as stargazing books, information boards in town, information at nearby tourism info centres and resource books”.

This concurs with statements by NAT1, TB20 and TB21 saying that a visitor information centre or a science interpretative centre would contribute positively to the visitors’ experience during their travels, thereby confirming the suggestion made by Atkinson (2012). As stated earlier, the quantitative data also showed this to be an area where visitors’ expectations versus their experiences showed a negative gap. The representatives of the local communities stressed the fact that the stars are such an important feature of the Karoo, and yet there are no tangible offerings or people to interpret the phenomenon, neither are there any events relating to astronomy. Surely, this observation questions the fitness of the region to be positioned as an astro tourism region in the light of the limited offerings provided. If products and facilities were made available for the children, youth and adults, it would be a great opportunity for all the locals to gain

a greater understanding of, and participation in astronomy phenomenon events. However, such products and facilities require expertise and a champion to lead the themed tourism route and destination.

Respondent and government representative, NAT1, said that the reason why the tourism growth is hampered is because the SKA core is not accessible to the general public, who are unaware of the magnitude of this project. One of the respondents suggested that:

“... a life size replica would be great to get a sense of scale and have a destination to visit that stimulates what is being done in the field by the SKA project outside Carnarvon”.

Life size replicas of the telescopes would complement the science visitor information centre and be an ideal way to position the Karoo as a leading astronomical destination in South Africa. However, a life size replica of the telescopes is an intricate instrument to produce. The MeerKAT precursor has been completed, which means that the service providers who could make a replica are no longer in service and the templates, which are subject to intellectual property rights, and the material for such an enormous dish measuring 13.5 meters in diameter are not available. The expectation of producing a life size operational replica or one with limited rotation would be very costly for mere aesthetic reasons.

Although many tourism businesses have acknowledged the significance of astronomy in the region, very few of them provide Astro Tourism experiences, such as events, activities or tours, for example, telescope and star gazing events, as part of their business offerings. However, the reason why these tourism businesses do not offer any Astro Tourism related experiences, is a general lack of interest, the perceived high cost of purchasing telescopes and their limited knowledge of astronomy. Despite the fact that many, in the tourism business, currently, do not provide any Astro Tourism experiences, several business owners, in fact, have indicated that it is definitely their intention to provide some form of Astro Tourism related activities in the near future, given the availability of funds. Of those tourism businesses that currently provide Astro Tourism related experiences, the experiences range from hosting star gazing sessions, artists who design t-shirts related

to the Astro Tourism theme and printed booklets that summarise Astro Tourism activities, such as where one can experience stargazing and obtain observatory information.

Table 16 depicts the PESTEL analysis. The data used for this analysis was retrieved from the collective response from the data sampling. The information was extracted during the analysis phase of the qualitative research process. The PESTEL analysis indicates that there are a number of challenges in the Karoo region that need to be addressed across the board. These issues have to be addressed by the destination developers and the proposed Astro Tourism route association, at a high decision-making level.

The three spheres of governments in the Karoo are politically disjunctive and characterised by a lack of financial and human resource capacity, as has been mentioned on numerous previous occasions. Furthermore, the area has a high unemployment rate with a concomitant dependency on government grants, which instills a culture of inherent reliance amongst local communities. Moreover, as the Karoo region is affected by climate change, it has officially been declared as a drought-stricken area by the Northern Cape government as a means of combating the conditions highlighted in the SDG's of the UNWTO (2013). Therefore, when one looks at the outcome of a PESTEL analysis, it becomes evident that a number of variables preclude the Karoo from being developed as an Astro Tourism destination. The variables of the PESTEL analysis are almost identical to the indicators of the previously mentioned Flora (2004) community well-being framework, which is referred to by Moscardo (2014). As mentioned before, the indicators of this framework is imperative for a well functioned local community. Therefore, if the variables of the PESTEL analysis of the destination is prioritised, it would have a positive spin-off on the well-being and growth of the communities.

Table 16: Application of PESTEL Analysis

PESTEL VARIABLE	RESULTS AND OUTCOME OF PESTEL APPLICATION
POLITICAL	<ul style="list-style-type: none"> ▪ Lack of synergy between local, district and national policy. ▪ Lack of capacity at local government level.
ECONOMIC	<ul style="list-style-type: none"> ▪ High unemployment rate due to slower agricultural sector. ▪ Low educational levels and skilled labour.
SOCIO-CULTURAL	<ul style="list-style-type: none"> ▪ Lack of interest from local communities. ▪ Lack of social cohesion and a platform for dialogue.
TECHNOLOGICAL	<ul style="list-style-type: none"> ▪ Poor signal and network within the rural area. ▪ High demand for upmarket technological facilities e.g. Wi-Fi at various points of interest.
ENVIRONMENTAL	<ul style="list-style-type: none"> ▪ Climate change affecting the local agricultural sector. ▪ Restrictions due to the Astronomy Geographic Advantage Act.
LEGAL SCENARIOS	<ul style="list-style-type: none"> ▪ Lack of proper registration of tourism businesses as well as tour guide registration and the grading of accommodation establishments.

Source: Researcher's own contribution

The SOAR analysis is a result orientated approach, as discussed in Chapter 2, which provides an overview of the destination and its state of readiness for development. The results obtained from the analyses and the interpretation thereof, will assist the stakeholders identify the strengths and opportunities which could contribute to the economic growth of these towns. The findings of this research indicate that the Karoo region has the potential to become a leading Astro Tourism destination.

Table 17: Application of SOAR Analysis

SOAR VARIABLE	RESULTS AND OUTCOME OF SOAR APPLICATION
STRENGTHS	<ul style="list-style-type: none"> • Seasoned travelers are increasingly demanding a knowledge enriched experience. • Demographics vary from the general public to astronomy enthusiasts to professional astronomers. • Types of travel group vary (e.g. scholars, students, families, retired persons and astronomy clubs). • Area is free from artificial light and gives the destination a competitive advantage for Astro Tourism development. • Host of leading globally significant scientific projects (SKA and SALT). • Friendly host communities. • Unique Astro Tourism product offerings, beautiful landscape and biodiversity. • Tourism features as a priority in Provincial Tourism Master plans, and IDPs.
OPPORTUNITIES	<ul style="list-style-type: none"> • Opens up unsuspected possibilities for cooperation among tourism stakeholders, local communities and scientific institutions. • Establishment of the SKA science VIC. • Establishment of the Astro Tourism route association. • Local economic development through active community workforces. • Growth in various niche market segments e.g. outdoor and adventure, culture and heritage, agro, eco and nature.
ASPIRATIONS	<ul style="list-style-type: none"> • Entrepreneurs and tour operators initiate joint business ventures with professional astronomers. • Self-sustainable tourism initiatives that are government led, community based and private sector driven.
RESULTS	<ul style="list-style-type: none"> • Specialisation to create advanced destination competitiveness. • Increased travel for educational travel amongst domestic and international travelers. • Improved geographic spread and seasonality.

Source: Researcher's own contribution

6.3.1.4 International case study examples of Astro Tourism initiatives

Respondent ST6 presented some crucial information about Chile as it is renowned for being an Astro Tourism destination, having 60% of the astronomical observation capacity in the world. Chile has more than 300 clear nights per year and to date, the largest observation facility globally. The tourism authority in Chile presents visitors with various tour packages that not only include visits to the observatory but also non Astro Tourism activities, such as night horse riding and overnight camps. The respective respondents also mentioned that Chile hosts special programmes and events led by the observatory during full moon as well as other astronomical events of interest, which are a big attraction

for the destination. In accordance with the findings from the quantitative research analyses of this study and an observation made by ST9, the majority of visitors to the Chile astronomy facilities are domestic travellers.

Respondent ST4 provided key information about the McDonald Observatory in Texas. This observatory offers guided tours to specific research sites and hosts special evening educational activity-based programmes. Such programmes provide evening Star Party viewing, live safe views of the sun, constellation tours and viewings through the various telescopes for school group field trips. These activities are accessible throughout the year and teacher workshops are offered in the summer. Additionally, the McDonald Observatory in Texas is working together with the State Park System to offer annual workshops to train park rangers in astronomy and dark sky preservation outreaches. Aggressive marketing in respect of tourism offerings and celestial events, such as eclipses, comets and planetary conjunctions, together with a strong presence on social media, is essential for astronomical phenomena to have an effective impact on tourist destinations. What the McDonald Observatory representative recommended is that a tourism association, alongside observatories and science projects, should develop a calendar together with a tourist map and brochures containing information about all the tourism offerings as well as the astro related activities at the observatories in the region. The McDonald Observatory further forms part of local heritage trail that has been established by the Texas Historical Commission.

6.3.1.5 Ideas to further develop the uniqueness of the area

The respondents had a wide variety of ideas and suggestions regarding further development in the region and improvement of the current offerings. When given the opportunity to describe the Karoo's attractiveness, it was stated that the Karoo has the most beautiful clear sky evenings and cosmos, both of which are visible to the naked eye. There are not many places in the world that can offer the beauty and clarity of a dark night's sky like the Karoo. These natural advantages should be used for the benefits that tourism could bring to outlying rural communities, while at the same time bringing economic, technological and scientific benefits to South Africa as a whole. In this respect,

Astro Tourism could play an important role, to which end, the following recommendations reflecting the outcomes of the research are presented.

Astro Tourism route development: At the moment, tourism businesses feel that “... as individuals they spend thousands to create a ‘spin-off’ from an astronomical perspective. It is recommended that “... more national and international advertising about SALT and the Observatory is necessary in order to bring more visitors to the telescopes”. The observatory should include tourism products and services throughout their marketing activities. The observatory should install a small planetarium or cinema to show films and documentaries as well as a resource centre or bookstore that has literature on star gazing and astronomy. The Cradle of Humankind is a World Heritage Site situated in the Gauteng Province, which illustrates the origins of humanity. “*The story of life on Earth is dated back to 4 and a half billion years and the story of the universe goes 14 and a half billion years*”. The Karoo has the opportunity to follow suit and share and showcase a phenomenal story to the rest of the world.

Respondent NAT1 emphasised strongly that “... *the Astro Tourism route is a creative link between our origins of life on Earth and the origins of the universe*”. The Karoo has a rich story to tell about astronomy, palaeontology, eco-tourism and agri-tourism and the tourism route and destination, now have the opportunity to link these sciences and the associated phenomena. A tourism route is in a favourable position for small tourism businesses, in the rural node, to be marketed and branded collectively. The tourism route enables tourism products and offerings to become more aware of other businesses and to form networks and linkages.

Respondent NAT1 said that tourism routes are successful if they are well planned and organised. There is no support for an Astro Tourism route, because at the moment, no tourism activities are related to astronomy in Carnarvon. Respondent NAT1 also indicated that should the tourism offerings be bolstered in Carnarvon, visitors would travel to Carnarvon to visit the SKA Science VIC and stay a night, travel to Sutherland to experience the SALT and stay another night, all *en route* to either the Western Cape or Gauteng Provinces. Tourism businesses in the Karoo should collectively provide packages for tour operators and add offerings of Astro Tourism experiences to existing

tour packages, as any route is predominantly supply-driven (Lourens, 2007). It is also advisable to link Astro Tourism to other related and complementary products in South Africa, such as the Johannesburg Planetarium and the Bloemfontein Observatory at Naval Hill in order to create themed touring routes. As the study conducted by the University of Zululand (2012) indicated, the development of tourism routes is the primary focus for development in the Karoo. Respondents NAT1, NAT2, ST1, ST2 and ST7 mentioned that the Karoo Highlands Route was being resuscitated as a result of a collaborative effort by the Northern Cape Province and Open Africa.

Figure 22: Towns participating in the Karoo Highlands Route



Source: <http://www.tourismupdate.co.za/article/104086/Tourism-routes-by-theme>

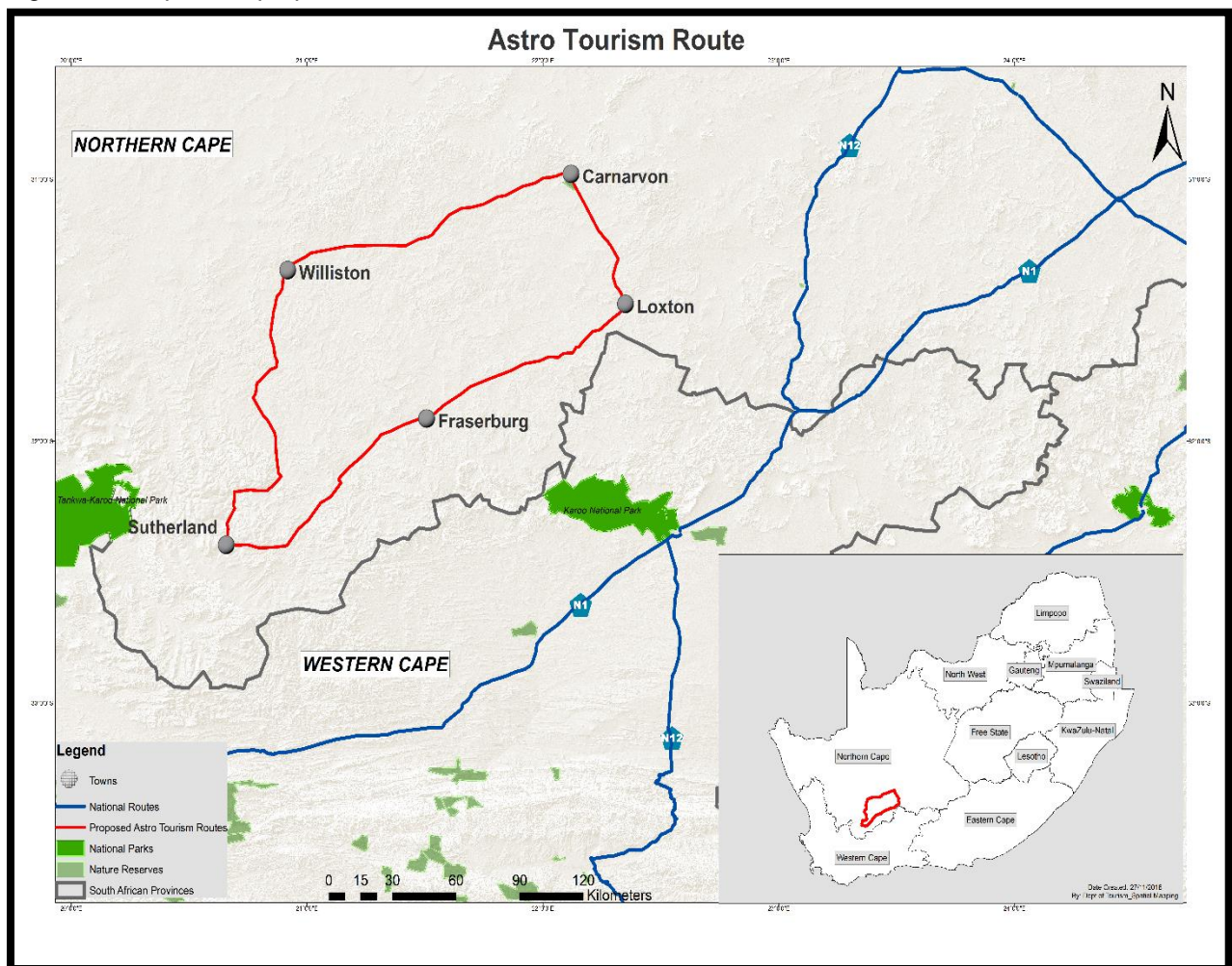
It is advisable that this route, The Karoo Highlands Route, be prioritised for inclusion in Astro Tourism offerings. The branding and marketing of the Astro Tourism route and the regions should be aligned with the branding of the SKA and SALT for greater audience and credibility. Stemming from Neven (2014), the right branding for a particular night market would have a significant impact on its growth and the brand identity of the destination. Respondents ST7 and DIS2 advised that Astro Tourism is a unique /experience in South Africa that needs to be marketed more aggressively in hybrid

packages for the Karoo. A region needs to develop an Astro Tourism brand. Government representative, NAT3 suggested that:

“... Astro Tourism promotional material should be developed and distributed to all places of interest in the Karoo especially at the tourist information centres and accommodation facilities”.

The proposed Astro Tourism route is from Sutherland to Fraserburg (R356), to Williston (R353), to Carnarvon (R63) and Loxton (R63). This tourism route is just off the N1 road with quick access via the R354 to Sutherland and then another quick exit onto the R63 back towards the N1 road to either of the major cities of Cape Town or Johannesburg. The map portraying the proposed Astro Tourism route is presented in Figure 23 below:

Figure 23: Map of the proposed Astro Tourism Route



Source: Researcher's own construction (Credit to the Department of Tourism, Spatial Mapping, 2018)

Stakeholder ST6 advised that in order to strengthen the Astro Tourism product offering, special programmes could be made available, just as in Chile, where the full Moon or some other astronomical events of interest can be observed. In addition, tour operators should provide visitors with tour packages that include visits to observatories as well as other, non-astronomy related activities such as hiking trails and cultural walks.

The registration requirements of the tourism route are three-fold: tourism businesses need to be registered by Companies and the Intellectual Property Commission (CIPC) and South African Tourism Services Association (SATSA), while the tourism association needs to be registered with the local tourism authority and the tourism route needs to be registered with the local tourism authority and the South African National Roads Agency (SANRAL). If a business operates in a rural area with very limited access to the internet, it becomes very difficult to gain access to the relevant organisations in order to meet the registration requirements for compliance, Thus, companies are not being registered making it almost impossible for emerging SMMEs to compete for contracts and sub-contracts, once a construction project is started in their respective towns.

The notion of 'going beyond Astro Tourism' is important. Local tourism business representatives TB1, TB18, TB20, TB21, participant DIS1 as well as stakeholders ST3, ST6 advised that experiences in both Astro Tourism and non-astro related activities should be developed. This statement corresponds with respondent ST9's pronouncement that:

"... the stars alone will do nothing to boost tourism ... we need a bigger plan and one that makes use of all that is great in the area" and respondent ST3 saying that *"... tourism that focuses only on astronomy might not be sufficient"*.

Respondent ST7 mentioned that the Karoo is known for hosting a multitude of mountain bike races that are considered world class. Visitors to the Karoo love the outdoors and combining this type of event with Astro Tourism in a package could promote a wider appeal. Respondent NAT3 mentioned that it is important to brand and link Astro Tourism to the Karoo's heritage in respect of archaeology, the richness of paleontological sites

and the indigenous astronomy knowledge of the Khoi-San people. This is an opportunity for the local community to share their indigenous stories and the significance of the stars and to link them to the actual science that lies behind the celestial phenomena. COMM4 and COMM1 said that the area is very well known for the number of unique corbelled houses that were built between 1811 and 1815. These corbelled houses are small domed houses that are built of flat stones, the name of which stemmed from the lack of a word for roof trusses by the Trekboers. The cement is a mixture of chaff and soil mixed with water and kneaded to the correct texture. Floors of these corbelled houses are a rich red colour derived from a mixture of fat and oxblood polished with a smooth stone. The Karoo has a rich heritage of nature and tortoise reserves, handmade local Karoo arts and crafts, Anglo-Boer War tours, 4x4 self-drive tours and marked farm trails.

COMM1 boasts that the local cultures of the indigenous groups are known for the 'Rieldans' (a cultural dance) and their rooibos tea making. Furthermore, well-known authors of fictional novels, such as Deon Meyer, Chris Marais and Julienne du Toit have not only contributed towards Afrikaans literature, but their stories have also put the Karoo on the map. COMM3 also mentioned that the area experiences extreme temperatures as voiced by respondent PROV3:

“... the Northern Cape Province is branded as the extreme province for its extreme sport, extreme weather, extreme culture and extreme adventure”.

Sutherland is known, in South Africa, as one of the coldest towns in the country and its snowfall, during winter, consistently draws large numbers of visitors. Cultural and heritage artefacts and sites can be incorporated into the story of the people of the Karoo, from the KhoiSan community to the Afrikaner farmers that settled in the area. There are various elements that showcase the beauty of the historical significance of the Karoo residents, their livelihood and their traditions, such as the 'Riel' dances, Karretjiemense as well as the railway history and the truck museum. Small town events are one way of commercialising the local culture and heritage. Festivals and street markets are making their way into these towns, which is a great opportunity for the presentation of authentic cultural performances. Local communities can get involved and take the lead in such events, using the platform to share their story and their day-to-day lives, and most

importantly, be the best ambassadors for their town. Small town events are a great way to ensure marketing opportunities, to lure a greater audience to the region and to contribute to the local economy. Cuisine tourism is another untapped opportunity for the local community to demonstrate their local culinary specialties, such as the traditional method of cooking in cast iron three legged pots over an open fire, using raw herbs from the fields and the production of karusaf, skuinskoek, red meat and cheese.

The respondents stated firmly that the agricultural sector and the tourism industry need to work together so that more activities can be developed for tourists. Fayos-Solé, Marín, & Jafari (2014) also confirm that the success of Astro Tourism product development is dependent on an integrated destination developmental approach. Activities such as events, adventure and cultural activities should be packaged into a single experience together with the astronomy features. By so-doing the Karoo would appeal to a wider target market. Almost half of the tourism business representatives stated that the Karoo should market the destination intensely with regards to its unique Astro Tourism offerings. The farmers have the opportunity to demonstrate their agricultural processes be it from sheep shearing, cheese making, taxidermy, guest farming stays, day-to-day farming activities, horseback riding or nature based products, just to mention a few as the opportunities are endless.

Furthermore, respondent NAT1 mentioned that tourism offerings in the Karoo include a dinosaur footprint and a rich history of trains and the significance of the stars. Fraserburg has a very unique, yet under-utilised and under-appreciated footprint of palaeontology. Palaeo-tourism complements astronomy very well as both improve peoples' understanding of the history and evolution of science. The tourism packages should be designed to intrigue the type of tourist who seeks to learn and understand the world around them. Furthermore, these unique tourism packages need to be paired with proper infrastructure and the management thereof.

Drawing from the inputs from most of the respondents across the various domains, there is a need for all to work collectively, and be committed to growing Astro Tourism products with specific offerings to become a leading niche market. The tourism businesses should all be linked and marketed in a manner that is aligned to the theme of astronomy and

science. The Northern Cape Tourism Authority (NCTA) should include Astro Tourism into its marketing strategy and encourage organisations to host their events in the Karoo region. The Karoo needs to be more aggressive with its marketing efforts in order to draw more visitors with a general interest in astronomy and science into the region. Furthermore, the provincial tourism authority needs to partner with South African Tourism as the national destination marketing organisation in their marketing campaigns, with the aim of drawing a greater domestic and international audience to the region. Marketing research is very important for the Karoo, so that tourism products and services are able to provide for the explicit travel requirements of travellers and accommodate the behavioural needs of those who visit the region. Respondents, ST7 and NAT2 recommended that new technology needs to be embraced to stimulate a greater understanding of tourism, its social development benefits as well as its economic value for local and provincial authorities, the business community and local residents. Marketing needs to occur more often at international trade shows, especially in Europe, where the similar time zones and weakness of the Rand can be beneficial to lure an increasingly growing number of foreign visitors.

6.3.2 Local Economic Development and the Pro-Poor Approach

Economic development and the Pro-poor approach are integral themes in tourism development and the discussions that follow highlight the economic development which is already evident and the opportunities available for further beneficiation along the tourism value chain as well as the challenges that need to be overcome to ensure region-wide economic development.

6.3.2.1 Economic development already evident

Respondents NAT1, NAT2, various tourism business representatives and COMM4 specifically noted that economic development is clearly evident through the dramatic rise in property prices in Sutherland and Carnarvon. This increase in the value of property is manifestly due to the development of the SALT and SKA projects. The local hospitality industry experienced an influx of visitors, which led to the expansion of guesthouses. During the stakeholder engagements, MT2 highlighted the fact that the hospitality industry

is experiencing an influx of visitors and increased bed nights in Carnarvon. This SKA project is especially appealing to those travelling for science, academic and educational purposes. Carnarvon has a great potential for growth in their tourism products and offerings.

The area is known to have the oldest sheep breed, the Merino sheep, in the country, which plays an important role in the history of the town as it provides the best wool in the country. The area is also part of the Red Meat District as its production of Karoo lamb is a major industry. From a cultural and heritage perspective, the town has great historical value in relation to brick-making and this provides an opportunity for agri-tourism. The observatory has made a huge impact on the tourism industry in Sutherland over the years, to the extent that businesses have bought-in to the whole celestial concept and named their establishments, Skitterland, Sterland, Jupiter and Blue Moon, just to mention a few. Carnarvon's tourism products, on the other hand, still need to embrace the SKA and find their place in the expanding market and link their branding to scientific phenomena.

Carnarvon and Sutherland, which include the two noteworthy global projects, are at different phases of development regarding the identity of their towns. Sutherland was never a tourist town and the highest number of visitors to Sutherland before the SALT development was recorded as 130 people in 1998. COMM 1 commented that the SALT transformed Sutherland from an agricultural town to a well-known astronomy tourist destination. The SALT has contributed significantly to the increase of tourism numbers and number of guesthouses in the town. COMM1 agreed with respondents, NAT1 and ST5 that since the inception of the SALT in Sutherland, a great deal of positive development had taken place in the town. Development has occurred particularly in the field of education and the local economy. The number of accommodation establishments has grown tremendously as people started their own businesses and created jobs for the local communities. ST5 and COMM1 mentioned that, in Sutherland, an unused building has been transformed into a computer laboratory where local community members are given access to free computer and internet services. This building is also used to host a number of workshops that provide the local community with training in a variety of skills. ST5 recommended that this computer laboratory should be used more optimally, for

example, it could even be used as an information office where tourists could engage with the local community members whilst receiving information about the tours on offer. It could also be a great place for interactions to take place between visitors and the local communities.

6.3.2.2 Further beneficiation along the tourism value chain

The level of service standards is very important for South Africa. The Northern Cape Province is well known for its friendly host communities, but it should be accompanied by a professional and efficient customer service. Local economic development occurs through an inclusive tourism value chain that supports the Astro Tourism niche. Stakeholders ST6 and DIS1 mentioned that in Chile, the local towns participate in the astronomical tourism by offering “... *the service of transfer, restaurants, agencies, tour operators, accommodation and more*”. Stakeholder ST6 and government representative NAT3 mentioned that the Karoo would experience greater growth if the availability of quality and star-graded accommodation were made available by local communities and local tourism businesses so that travellers with different budgets could be accommodated. Respondents ST6 and DIS1 indicated that astronomy needs to be promoted in conjunction with partnerships delivering quality products and services to tourists. The local communities in the respective towns should participate in Astro Tourism niche development projects. Their involvement, through amateur astronomy and authentic historical astronomy heritage trails, could significantly enhance the tourism experience. It was recommended that local communities provide tourists with shuttle services, local dining facilities and entertainment, arts and crafts, tourism agencies, tour operators, local guides and accommodation. A conference facility is also crucial as it would draw a variety of events to the area, whether is science related or linked to agricultural and governmental functions or banqueting. Such supporting services in the tourism value chain would encourage entrepreneurial and business opportunities. The hospitality industry in the Karoo needs to ensure that it complies with the grading and standards of the South African Tourism Grading Council.

Respondent NAT1 mentioned that the establishment of the Astro Tourism route would provide a unique experience for drive tourists who travel annually from Gauteng Province to the Western Cape Province. It is a quick off-route divergent that would not only enrich their journey, but also contribute towards increasing tourist spend and bed nights in the local towns. For any destination to develop and maintain its sustainability, respondent PROV2 advised that the generic focus should lie in its attractions, amenities, access, accommodation, tourist information distribution, entrepreneur development and improved communication infrastructure. The development of the tourism product in the Karoo should comply with the following guiding principles:

- Creation of decent jobs;
- Tourism infrastructure development;
- Tourism product and attraction development;
- Travel experience enhancement;
- Enhance tourist distribution to isolated rural areas;
- Attract more visitors, extended length of stay and increased tourism spend;
- Create platforms for launching cultural industries and manufacturing; and
- Viability and sustainability.

6.3.2.3 Challenges in ensuring region-wide economic development

During the interactions with respondents representing the various stakeholders, it became clear that the Karoo area was ideally positioned for the development of Astro Tourism. Many of the tourism businesses and local community representatives mentioned that the lack of prioritisation and interest displayed by local municipalities towards the towns' development caused a stumbling block as there are no plans in respect of tourism in the LED component of municipalities. The lack of interest in tourism development displayed by local municipalities is due more to the immediate demand for basic bulk infrastructure and public services. Basic services are critically important in municipalities with few economic opportunities. The draft annual budget of the Kareeberg Municipality (2018) indicates that it is doing its best to deliver effective public services within the constraints

of the budget allocation, but is still faced with the following challenges that are a source of concern:

- "...aging and poorly maintained water, roads and electricity infrastructure;
- the increased cost of bulk electricity (due to tariff increases from Eskom), which is placing upward pressure on service tariffs to residents; and
- wage increases for municipal staff that continue to exceed consumer inflation" (Kareeberg Municipality, 2018:1).

A presentation made by Dr Misa, representing the Department of Cooperative Governance (13 June 2018), demonstrated that many challenges exist in small rural municipalities, within the South African local government context, which present various opportunities for intervention that should be considered by the business sector. Such challenges include failure to render adequate services to communities and a lack of communication between municipalities and the business sector. Local municipalities also face insufficient sourcing strategies, while deficits in procurement procedures fail in respect of service delivery. In addition, the operation and maintenance of infrastructure, in a cost effective manner, remains a challenge for poorer municipalities. Municipalities struggle with providing water purification chemicals at remote water treatment plants and are often short of supplies, which then results in poor quality drinking water. Many small rural municipalities still continue to face prolonged disruption in service delivery (Misa, 2018).

An additional concern was raised by respondent DIS1, namely, that there is a lack of prioritisation of the SKA related developments in the Integrated Development Plans (IDP's) of the local municipalities. Stemming from Binns and Nel (2002), local economic development is an important process that is incorporated in the mandate of local municipalities. However, as mentioned by Snowball and Courtney (2010), developmental strategies at local government level are often very poorly implemented due to limited resources and the lack of capacity. However, during a recent contact with the SKA management, the researcher was informed that the SKA will be funding the updated IDP during the 2018/19 financial year on behalf of the Kareeberg local municipality, as they were unable to do so. It is, therefore, proposed that support in the form of adequate

financing and long term planning be granted to these rural areas (Gartner, 2005). If a project, especially one of any great magnitude, does not appear in the local IDP, it would have not been possible for it to continue with any kind of infrastructure development. The absence of the SKA projects in the local Karoo Hoogland, Ubuntu and Kareeberg municipalities would make it very difficult to realise the true potential and development opportunities in the towns of Sutherland, Fraserburg, Williston, Loxton and Carnarvon.

The tourism business representatives mentioned that they do not receive any support from the local municipalities and would like the relationship between the local communities and the private and public sectors to be strengthened. It was, therefore, recommended by NAT1 that local municipalities contribute to the tourism industry in non-monetary terms in the interim, by leading discussions to bring about collaboration and generate creative and innovative ideas as a collective with local tourism businesses to realise and reach the region's true tourism potential. COMM5 showed great concern about the impact of the SKA project on the natural environment, such as the destruction of fauna and flora to make space for the installation of satellite dishes as well as the excessive use of water in a drought-stricken arid desert region. Furthermore, concern was voiced about the effects of climate change on the Karoo region, which could potentially disturb the agricultural sector and food distribution in the area. The increased amount of fracking and establishment of wind farms were also mentioned as risk factors threatening the natural environment.

Most of the respondents, COMM1 to COMM5 and, respondents NAT1, DIS1 and LOC1 stressed the fact that the socio-economic status of the towns in the area is a major challenge. They are faced with a high unemployment rate, extreme poverty and dependence on governmental social grants, high alcohol abuse and low educational levels. These observations are corroborated by those of Kovács and Nagy (2013) and the Provincial Treasury (2014), in their description of the characteristics of rural areas. The majority of people living in the Karoo are dependent on the state's social grant system and set a low value on the importance of employment. Most of the locals are economically inactive in a "... *declining economy which is based on sheep farming*". The lack of economic development opportunities in the local municipalities causes large numbers of

the population to leave their home towns to seek employment in urban areas. There is a level of dependence, by both the private sector and local communities on local government, to give greater recognition and support to the tourism sector as neighbouring areas are seen to have already benefited from the tourist industry, for example, the Red Meat District brand in the Karoo. However, local municipalities have neither the capacity nor the funds to prioritise tourism development over basic services such as water and sanitation.

6.3.2.4 Local community employment and a Pro-Poor Tourism approach

Respondent NAT1 emphasised the fact that the SKA projects had embraced the notion of Pro-poor throughout the entirety of the project. This is in accordance with Mitchell and Faal (2007), Rogerson (2006) and Torres and Momsen's (2006) statements that the Pro-poor approach addresses the net benefit of local communities. The SKA project offers a variety of job opportunities to about 50 local residents as indicated by NAT3. The employees on site include office administrators and construction workers on the SKA site as well as sub-contractors. A number of local businesses provide the SKA site with transportation and logistical necessities. Respondent NAT1, who was in agreement with NAT2 and COMM4, mentioned that in addition to the influx of people who are working on the SKA site, the demand for accommodation has led to the creation of more jobs in the hospitality industry.

Of the tourism businesses who responded, approximately 95 local community members are permanently employed and approximately 43 are temporary staff. Temporary staff are usually appointed during the peak season, which is during the winter months, from June to the end of August; the Easter holidays during March and April; the Flower season lasting from June to October and the summer school holidays in December. The tourism business representatives were requested to indicate whether they were residents in the Karoo region and to disclose their ethnicity. The majority (74%) of the owners indicated that they originate from the respective local regions with 60% of the respondents indicating that they are descendants of the White ethnic group, while only 4% are members of the indigenous Coloured ethnic group and 36% did not disclose their

ethnicity. More than half of the responding accommodation establishments indicated that their businesses receive clients throughout the year. Tourists visiting throughout the year are usually those representing the farmers' corporations and agricultural businesses and the scientists, academics and technicians who work on either the SKA or SALT sites. Respondents NAT3, NAT4 and ST3 emphasised that the SKA project held numerous events and stakeholder engagements on site and that local communities and businesses had the opportunity to provide catering and hospitality services. However, it was recommended that local communities and businesses need to be capacitated and receive more training, so that they are able deliver services of the highest standards. Training should include customer service excellence, visitor information services and tour guiding.

The above respondents also proposed that local government and the SKA unit responsible for social cohesion should provide training and information sessions about the astronomy projects, initiatives and prospective opportunities to local community members in which they could become involved. The Northern Cape Department of Economic Development and Tourism already anticipates offering tour guiding training for members of the local communities, once construction of the proposed visitor information centre in Carnarvon commences. In addition, since its inception, the SKA has provided artisan training for community members (Department of Tourism, 2018). Tourism business representatives, TB1, TB18, TB20, TB21, and government representative, NAT3 stated that throughout the tourism product development process, local communities should actively engage and take the lead by providing amateur astronomy activities and indigenous walks to historical buildings and sites to enhance the overall visitor experience. The local communities from COMM3, COMM5, and respondent NAT1 said that towns in the Karoo region are the hosts of two well-known events, the Williston Winter Festival in Williston and the Toneelfees in Fraserburg. Both these towns have increasingly contributed towards a growing interest in their towns by outsiders and domestic tourists. Small town rural events and festivals, such as the Williston Winter Festival, Carnarvon Fly-in, AfricaBurn, Trans Karoo Mountain Bike Challenge and the Fraserburg Logan Drama Festival are organised by local tourism businesses and have contributed towards increasing civic pride amongst the local communities as well as providing opportunities for entrepreneurship.

The impact of Pro-Poor and rural community development have also been negatively critiqued by a number of authors, such as Eusébio, *et al.*, (2014), Choi and Sirakaya, (2006) as well as Tao and Fuying (2009), who argue that local community members receive minimal beneficiation from the tourism products. The rationale behind small-scale niche markets, such as Astro Tourism, being beneficial to local communities is, thus, being queried. The question being, if tourism initiatives on a national scale contribute minimally to the social and economic well-being of local rural communities, how then can the products of rural local community niche markets?

Despite the negative critiques regarding the outcomes pertaining to rural local community niche markets, the development of both astro and non-astro tourism products in the Karoo region is deemed to be viable. The Karoo is definitely a region that has the potential to be developed. The SKA and SALT are globally popular astronomy products, thereby making the appeal for astro tourism development defensible. The Department of Science and Technology have already received copious requests from international investors willing to provide astronomy related activities in the respective Karoo towns.

6.3.3 Community Participation and Ownership

Community participation and ownership are integral themes that underpins sustainable tourism development.

6.3.3.1 Enabling community involvement

During a stakeholder engagement, MT6 mentioned that:

“You cannot eat astronomy, but it has influence on the sustainable development goals and has lasting beneficiation on the livelihoods on the local communities”.

As Haukeland (2011) stated, community participation plays a crucial role in the implementation of sustainable tourism. Respondents NAT1, NAT3 and ST5 said that, just as the situation at the SALT, in Sutherland, experienced an overflow of visitors, the SKA, in Carnarvon, also gives local communities the opportunity to offer star gazing lessons

against the background of indigenous story-telling narratives. Respondent NAT3, together with several representatives from other relevant stakeholder groups, emphasised that in order to contribute to destination enhancement in the Karoo, it was desirable to give smaller optical telescopes to each town, thereby providing ideal opportunities for local communities to present star gazing sessions for visiting tourists and, as such, generate income, preferably into a community trust. This would generate more interest in astronomy for both the local communities and the visiting tourists. However, it should also be noted, as was indicated by respondents NAT2, PROV1, PROV2, DIS1 and LOC2, that the necessary expertise is not yet to be found in the local community. Thus, local communities would have to be capacitated in basic tourism and hospitality skills by either the local authorities or provincial government or the tourism route association. Such training has already been rolled-out nationwide, for example, the National Department of Tourism has hosted the Tourism Capacity Building Programme, the Tourism SMME Incubator Programme, Service Excellence and the Tourism Incentive Programme. Training of the local community about astronomy is a long term aspiration. However, the observatory in Sutherland and the SKA could continue to provide local communities with star gazing sessions and updates on the findings of the SKA Project. These activities would improve awareness and stimulate further interest. As Gray stated (Okazaki, 2008), local communities need to be equipped with the most appropriate and relevant skills as part of destination development. Capacity building training should be in the fields of arts and crafts, accommodation, food and beverage, tour guiding and registration, business grading and registration, service quality and marketing skills. Tour guide training would provide entrepreneurial opportunities and a sense of pride amongst the local communities. Tourism establishments should also have similar instruments, whether they be amateur ones or not, and offer star gazing experiences during the visitors' stay. This is a quick and affordable investment to create interest in the celestial beauty and expanding the astro product offerings for tourism consumption.

Respondents NAT1, DIS1 and LOC1 mentioned that the SKA project would benefit and have a positive impact on local communities, but would still not benefit every single person. Like all projects, beneficiation is limited to the scope and requirements of the projects. Therefore, it remains the responsibility of local communities to find their 'space'

in the project and equip themselves to ensure that they benefit from the '*spin-off*' of the SKA project. Agreeing with respondent DIS2, the participants believed that the ultimate goal of development is that local communities become self-sustainable and expand their businesses. NAT1 said that the residents have a rich history of the use of plants for medical products and that they can use this indigenous knowledge to their advantage. They can further empower each other by producing related products, for example "... *customised soaps that are locally produced*". Such an initiative would work well in the agri-tourism sector, where tourists could participate in the manufacturing process of the products.

Respondents NAT1 and DIS1 both strongly indicated the need for the establishment of conferencing facilities in the respective regions. It was recommended that the conferencing facilities must include accommodation and a '*decent*' restaurant. The proposed facility should be designed with the capacity to host political and agricultural events. It was further recommended that local communities participate actively in the development of this facility by means of social contracts set up by businesses as part of their social responsibility towards the local communities. This would provide an opportunity for local communities to partner with the formal business sector of the region. NAT1 suggested that the partnership should comprise of a franchise business with the local municipality and the local community making the projects '*semi-state owned*'. This agrees with Briedenhann and Wickens' (2004) statement that partnerships between the public sector, the private sector and the local community need to be driven collectively for tourism to be sustainable. The objective of community participation is, therefore, strengthening the relationship between all the active role-players in order to facilitate optimal decision-making and implementation (Aref, 2011).

6.3.3.2 Social legacy of the communities

The local communities from all the focus groups, COMM1, COMM2, COMM3, COMM4 and COMM5, stated that they would appreciate a closer working relationship with the SALT and SKA. It seems fitting that learners are exposed to astronomy and its instruments, such as telescopes, from an early age, and develop a passion for what is

unique in their own region. The representatives from the local communities expressed their need to have regular field trips to their project sites, especially for primary and secondary school-goers. All agreed with TB5 that this would really have a positive impact on the learners especially as astronomy forms part of the 'Earth and Beyond' section of the South African educational curriculum.

However, the local communities acknowledged that the SKA already plays an active role in local schools by the hosting of various workshops on mathematics and the natural sciences and potential careers in these fields. The active participation of the SKA, at school level, encourages learners to study mathematics and science. Respondents PROV1, ST5, ST3 and NAT3 provided some insight into the programmes offered by the SKA and SALT. The Human Capital Division of the SKA Office offers bursaries to science and engineering students at under- and postgraduate levels.

The local community representative from COMM4, and respondent NAT3, expressed appreciation to the SKA for providing the local schools with computer laboratories, internet access and the training of teachers. Despite acknowledging the role SKA plays in the local educational sphere of the region, the community indicated that not all scholars benefitted, as not all students are mathematically and science orientated, and many want to pursue other fields of study, but unfortunately this falls outside the SKA mandate.

6.3.3.3 Business ownership

With regards to the tourism industry, it is debatable to what extent the SKA project has created benefits for the local community. The majority of the responding tourism businesses indicated that the current impact of the SKA and SALT differs from business to business. Local communities, COMM1 to COMM5, and respondents NAT1 and ST5 said that the SALT and SKA definitely had a positive impact on businesses. Many indicated that they received a huge influx of visitors as a result of these scientific projects, while some have not. This, mainly, has to do with the distance of their business in relation to the projects. However, there have been very little new entrants into the tourism industry. Even more concerning, is the fact that the transformation of ownership has not effectively transpired in the local tourism industry. This reiterates the statement by Saarinen

(2010:721) that even though the entire community is not benefitting in respect of ownership or management of tourism products, it is imperative that tourism development concedes the notion of “... *transferring of benefits to a community regardless of location, instigation, size, and level of wealth, involvement, ownership or control*”. The pattern of ownership needs to be continually monitored by all the stakeholders involved, whether by the tourism or astronomy sectors. According to the communities “... *no one seems to be interested, or given the opportunity to lead*”. Transformation has not truly happened on the supply side of the tourism industry as existing businesses expand, but then again, not a lot of new black-owned businesses have entered the tourism industry.

Respondents ST3 and most of the representatives from the local communities, COMM1, COMM2, COMM3, COMM4 and COMM5 said that the reason why towns in the Karoo region are not being developed into the desired state is due to a lack of leadership and the absence of committed community members. The local communities need to “... *take ownership to a certain extent*”. Of the responding tourism businesses, the number of responding owners, who are residents of the Karoo, constitute thirteen (13) Whites and one (1) Coloured, while three (3) of the respondents are non-residents. This ratio contradicts a statement made by COMM1 indicating that tourism business owners are predominantly those who do not originate from the Karoo region.

The majority of the responding stakeholders mentioned that apathy and a lack of involvement by local community members inhibits the growth of tourism development. A perception about the lack of tourism potential in the Karoo needs to be addressed. The local community needs to acknowledge the value and beauty of their town and culture. The expectations of local communities need to be carefully and realistically considered in respect of the extent to which beneficinations can accrue from tourism and the astronomy projects. The beneficial impacts from both sectors will not be felt in the towns immediately, but will become apparent, to some extent, over time. Therefore, it is proposed that local communities drive their own initiatives to find ways to contribute to economic development in accordance with their own skills and capacity. Many of the stakeholders found that, in many instances, the unrealistic expectations are due to a lack of expert knowledge about the SKA and SALT projects.

6.3.4 Stakeholder Collaboration

It has become evident that stakeholder collaboration is imperative. It is important that a platform such as a tourism association should serve as a vehicle to drive such collaborative efforts and indicate clear roles and responsibilities for all the affected parties.

6.3.4.1 Tourism Association

According to respondent ST3, an effective manner to address the various challenges facing the Karoo, is to undertake information sessions on a regular basis. Respondent NAT3 recommended that workshops with key stakeholders should be organised to discuss the value of the cultural heritage of the area and the progress made in the implementation of the SALT and SKA. This could be achieved by establishing a tourism association through which collaborative opportunities can be identified, effective structures established and funding sourced. NAT 3 stated that a tourism association would:

“... provide a common voice that can have muscle to make a wider impact. The tourism association will also be able to mobilise the relevant stakeholders in an organised manner and further facilitate the development and implementation of key initiatives”.

ST2, in full agreement with the local community representatives, stated that a tourism association must be properly coordinated and provide the region with a common vision to implement tourism initiatives collectively. As the region begins to gain momentum as an Astro Tourism destination, marketing research could lead to the development of appropriate tour packages and effective decision-making concerning destination development. In addition, respondent NAT1 stated that:

“... the only way to benefit business is by increasing feet through the door. Drawing additional tourists to this area who are specially interested in the SKA project and come here to see it; or tourists who hear about it while they are in the area and decide to go and see what it is all about and maybe even stay a night or two”.

All the local community representatives, COMM1, COMM2, COMM3, COMM4 and COMM5, indicated that their towns or region did not have a tourism association. It was decided that a tourism association is needed to grow tourism in the Karoo region. COMM1 and COMM5 stated that their towns did have a tourism association but that it was unsuccessful due to lack of leadership and a collaborative approach. Respondent ST1, who was in agreement with the sentiments expressed, stated confidently that he:

“... strongly believe that this can be achieved, but will be incredible challenging to establish because of the distances involved.....once people see the value in an association they will look past the logistical challenges”.

He added that *“... it will take a fair amount of time and careful guidance and mentorship to be successful”*. Most of the responding stakeholders agreed with ST1 that a tourism association would strengthen tourism development in the Karoo as it could put together a collaborative capacity, funds and resources.

Representatives of the local tourism businesses were asked whether they would be willing to support a tourism association in their region and the majority indicated that they, indeed, would join a tourism association. Some of the respondents mentioned that previous attempts to establish a tourism association had taken place, but had failed as mentioned previously. The majority agreed that the establishment of a tourism association was critical and respondent TB3 recommended that, this time, the tourism association should be:

“... an independent body [from political affiliation] that supports and inform [tourism business] stakeholders. The tourism development body [or association] should not be dependent on the [public sector] stakeholder as nothing will develop or progress. It is [better to] be involved and contribute [to initiatives] and out of that [broader public] participation will come”.

Respondent NAT2, in turn, agreed that:

“... a local association that involves all related stakeholders including local government, scientists, tourism and other businesses, community members

etc. This will ensure coordination and support. This structure should then also link in with other relevant provincial and national business and tourism groupings and organisations”.

Closely related to the concept of tourism associations is that of collaborative effort.

6.3.4.2 Collaborative Efforts

Several tourism business representatives indicated that they expected closer collaboration with one another and to get more involved in the development of the region. When asked whether they make use of the local farmers, 96% indicated that they do make use of local farm products and offerings, with approximately four percent (4%) stating that they do not do so. The respondents were then asked for the reasons as to why they do not make use of the local farmers, and most said it was due to the lack of goods and services, followed by those who felt that local suppliers do not deliver quality products and services, the extremely high prices charged locally and unreliable delivery services. Respondent TB1 said that tourism businesses should rely on local suppliers like the farmers, but in response respondent TB12 replied that “... *local suppliers, like the cooperatives charge at least 50% higher than the price of products in Worcester*”.

Respondent, ST6 shared information about the successes of Chile as a leading Astro Tourism destination stating that local towns actively:

“... participate in the astronomy tourism because they offer the service of transfer, restaurant, agencies, tour operators, local guides and accommodation”.

ST6 also stated that “... *promoting this type of tourism is the partnership and delivering a quality product to tourists*”.

ST2, the representative of a tourism route management authority, indicated that a tourism association and a tourism route are ideal for the area and most definitely to be recommended. Respondent ST4, representing the McDonald Observatory in Ford Davis, Texas, provided learning offerings in this regard. The respondent mentioned that they had

developed a system for coordinating calendars between the astronomy facilities and the local accommodation establishments, so that the tourists could be informed on a continuous basis about events at the astronomy facilities as well as the timing of celestial happenings. This assists tour operators and tour guides to manage their travel itineraries for visitors. This particular respondent also mentioned that a tourism route had been established by the Texas Historical Commission, which draws all the stakeholders together to support initiatives by the McDonald Observatory to provide complementary services in the tourism value chain and by so doing strengthening the region as an Astro Tourism destination.

6.3.5 Roles and responsibilities of the various stakeholders

The researcher requested that all the respondents present their expectations concerning the roles and responsibilities of the various stakeholders. They were asked to give very specific indications about what they expect from each role player in respect of accountability.

6.3.5.1 Local municipalities

Respondent LOC1 mentioned that of all the towns in the Karoo, Sutherland had made the most progress in respect of developing the tourism industry. The Karoo Hoogland local municipality offered assistance to the Kareeberg local municipality with the implementation of the IDP in relation to tourism as well as how to create a living dialogue with local communities and businesses. The Karoo Hoogland local municipality has a twin city agreement with Fort Davis in Texas in the United States, through the agency of National Research Foundation, in which a vision and resources are shared. Respondents DIS1, LOC1 and LOC2 stated that no tourism strategy or plan has been implemented at local municipality level. Under these circumstances, it is fortuitous that such a strategy has been positioned within the existing Northern Cape Provincial Tourism Master Plan (Northern Cape Department of Economic Development and Tourism, 2015). The provincial tourism department has already indicated that Astro Tourism development is an ideal proposition and relevant for the Karoo region.

ST2 and NAT3 also mentioned that the provincial and national government is responsible for providing the resources and creating an enabling environment for sustainable tourism development through policy and tailor-made programmes for implementation of the plans. Respondents ST2, ST3, and ST7 were in agreement with responding tourism business representatives TB12, TB13, TB16, TB17 and TB19 that the government sector, irrespective of its sphere of interest, should be responsible for supporting the sustainable development of tourism routes and the aggressive marketing and promotion of the Karoo area as an Astro Tourism region. Finances can be drawn from government grants and applications made to financial institutions such as, SEFA, SEDA and the IDC.

The establishment of a PPP agreement with the local community can also contribute towards development through community trusts. In-kind contributions can also be made to support the route, for example, the printing of brochures, exposure at South Africa's biggest tradeshow, the annual Tourism INDABA, as well as other domestic and international tourism tradeshows led by South African Tourism and the Tourism Incentives Programme at the National Department of Tourism.

6.3.5.2 Local communities

The local community representatives, COMM5 and COMM2, together with the tourism business respondents, TB19, TB2, TB20, TB21 and TB222, conveyed a strong message that the obstacles preventing positive development in the Karoo are predominantly due to a lack of interest and poor prioritisation of projects in the respective local municipalities. They also mentioned that internal politics are at play at local government level. This lack of leadership and poor implementation of plans leads to a lack in the provision of the necessary bulk infrastructure. Consequently, they suggested that local municipalities should be more supportive of local economic growth nodes and provide adequate infrastructure. They also agreed that the local municipalities should allocate more funding and draft a tourism development strategy for the Karoo towns as well as establish a tourism information office.

The respondents, ST1, ST2, ST3, ST7 and NAT3, emphatically expressed the view that local communities should mobilise themselves and identify specific interventions and

business opportunities that would become available due to the development of the SKA and SALT. Local communities need to “... *take a level of ownership of both projects*”. ST2 also said that the local communities should become more passionate about the region and promote the astro areas to visiting tourists. Tourism business representatives, TB12, TB13, TB16 and TB17, also mentioned that local communities should “... *be part of the whole tourism industry*” by ensuring that the towns are kept clean and by becoming more involved, being a reliable workforce and delivering quality services.

6.3.5.3 Tourism businesses

Respondents ST3, ST7 and NAT3 agreed that the tourism businesses should seek opportunities, arising from the astronomy projects, where they could make a contribution and play a more active role through their specific trade and business. ST1 and ST2 both agreed that the tourism businesses should take the lead in implementing strategies that could benefit the region and one in which businesses could operate. They also stated that businesses should share information concerning the astronomy projects with visitors and increase an awareness of these projects as widely as possible. Respondent NAT3 also indicated that tourism businesses should:

“... organise and position themselves on SKA business opportunities and contribute their corporate social investment into SKA initiatives to create a wider societal impact”.

The tourism business owners recognised that there was a vacuum in the industry and stated that “...*we as residents would love to make a contribution to the well-being of the town and local work-force*”. Respondent TB13, representing the tourism businesses, said that:

“... local businesses are the heart of any tourism town. The government should give us a grant - it is very difficult to get products and services in a small town. Transport is expensive and turnover not so big and quick as in bigger places. We do provide jobs”.

It is not easy for small businesses to obtain funding from government funding bodies, such as the Industrial Development Corporation (IDC) and National Empowerment Fund (NEF). Emerging entrepreneurs are required to provide detailed information about their business ventures and include proper documentation, such as a business profile and business plan, financial statements and projections as well as contingency plans. All this requires a level of knowledge and skills. It is also important to ensure that public funds are used with accountability and to eliminate wasteful and irregular expenditure. Respondents TB2, TB13, TB16 and TB17 all stated that tourism businesses carry the responsibility for providing quality services to their customers and grow the tourism sector. Furthermore, tourism businesses should realise that receiving a public grant should be perceived as a boost to local entrepreneurs to improve themselves alongside the local communities and local economies and not merely for personal ambitions.

6.3.5.4 SKA management team

Respondents, ST2, TB1, TB3, TB16, TB19, TB20 and TB21, all stated that the SKA management team should always keep the community, local businesses and local municipalities informed about the progress and future prospects of the SKA project. The SKA team should also show more empathy and sensitivity towards local communities and host regular public information sessions. Respondents NAT3 and ST3 said that it is very important that the “... SKA impart knowledge about the SKA, in order to increase interest, which can lead to more participation by the locals in the project”. Furthermore, respondent ST1 recommended that SKA should provide a “... supporting structure and create an environment where dialogue and joint planning can happen”. Many also mentioned the fact that a science information centre is crucial. Most respondents agreed that a science information centre would serve as a central place where information could be shared with the local communities and as a convenient space to interact with the SKA team.

Respondent NAT1 shared the information that many science visitor centres were built in an established environment where there is a lot of traffic, such as in shopping malls. The SKA science centre is a newly, stand alone, constructed feature. All were in agreement with DIS1 that it is important for the building to be multi-functional in order to draw visitors

and serve as an economic hub in Carnarvon. It is imperative that the Science VIC should be a hub for various activities, such as an exhibition space for tourism and radio astronomy and a conference facility, for example, for agricultural, scientific, renewable energy and political events as well as for hospitality and information services and a restaurant.

The centre should include a commercial arm accommodating a conference facility, small observatory, graded accommodation, hostels for learners, shuttle services and decent catering, thereby creating a space for development. It was suggested that a private public partnership be raised with an established franchise that could bring political and agricultural events to the town. The contracts awarded to businesses should include a clause compelling businesses to assume social responsibility for local residents in respect of employment and development. This is in response to the instruction given in terms of Section 76(4)(c) of the Public Finance Management Act of 1999 (Act 1 of 1999) (PFMA), which requires that the Standard for Infrastructure Procurement and Delivery Management (SIPDM) be implemented by all the organs of State, subject to the PFMA and effective from 1 July 2016 (National Treasury, 2016). This is an attempt to ensure that any government initiative is both feasible and sustainable, particularly since they relate to infrastructure projects. Infrastructure development in respect of the proposed SKA science visitor information centre building will require a range of expertise as it is expected to be a world class construction that reflects the complexity and first class uniqueness of the SKA project. The Cradle of Human Kind and its visitor centre, Maropeng, is one of South Africa's nine world heritage sites, achieving much of its success using the PPP model. This is one of the most unique world heritage sites in the country and has won architectural prizes worldwide because of its remarkable building construction. Private public partnerships play a very important role in the establishment of a visitor centre. It is important to ensure that the initiative is managed according to the rules governing good business practice to prevent 'white elephants', wasted efforts and expenditure. An example was cited of a tri-part ownership between the Protea Hotel Group, the IDC and the local community. Regardless of who the private partner is, the local community would need to find its space in the private public partnership sector and provide services that demonstrate the importance of their local cultures and the quality of

their services. The SKA does not have public access so respondent NAT1 suggested that a life-size replica of one of the radio telescopes, placed at the visitor centre, would be ideal for visitors to witness the enormous scale of the telescopes: the visual impact of the project would be awe inspiring.

The roles and responsibilities of the respective stakeholders have been described and consolidated across the four sub-themes of the qualitative data analysis as illustrated in Table 18.

Table 18: Consolidated roles and responsibilities

STAKEHOLDER	LOCAL COMMUNITIES	LOCAL TOURISM BUSINESSES	GOVERNMENT	ASTRONOMY MANAGEMENT
THEMES				
TOURISM PRODUCT DEVELOPMENT AND INFRASTRUCTURE	<ul style="list-style-type: none"> • The “Proud Owners”. • Be hospitable towards tourists. • Promote astro areas and rally behind the astronomy projects. • Promote SKA and positive image of the Karoo. • Find and create platform to demonstrate local cultures. • Provide quality services to the tourism industry and be a reliable workforce. 	<ul style="list-style-type: none"> • The “Great Vehicle”. • Provide a diversification of products and services. • Recognise and meet the needs of visiting tourists, such as scientists and government officials. • Lead in implementing strategies for the beneficiation of the region. • Quality standards offerings and service excellence. • Improved collective marketing and branding (tourism and astronomy). 	<ul style="list-style-type: none"> • The “Great Enabler”. • Promote the Karoo as an Astro Tourism destination. • Rejuvenate and support the local tourist information office. • Identify and prioritize maintenance of key attractions. • Supply and improve bulk infrastructure i.e. upgrading of roads and signage. • Erect signage and market the destination more aggressively. 	<ul style="list-style-type: none"> • The “Key drawing Card”. • Invest in the infrastructure. • Contribute to market access initiatives and campaigns • Establish a Visitor information centre and scheduled site visits (link tourism and education/science).
LOCAL ECONOMIC DEVELOPMENT AND PRO-POOR	<ul style="list-style-type: none"> • Encourage youth to concentrate on education. • Be a reliable workforce. • Embrace entrepreneurial opportunities • Take ownership and mobilize themselves. 	<ul style="list-style-type: none"> • Find linkage with agricultural sector. • Capacitate and train management and front-line staff. 	<ul style="list-style-type: none"> • Hold private sector liable for their social responsibility. • Provide frequent training and skills development programmes. • Allocate resources affectively. • Provide an enabling environment through town planning and policy. • Develop a tourism development strategy for the Karoo Highlands region within the IDP of the local municipalities. • Create socio-economic development opportunities inter-governmental department projects. 	<ul style="list-style-type: none"> • Create local job opportunities. • Create space and opportunities for commercial tourism activities. • Support local tourism sector. • Support structure and environment for dialogue and joint planning. • Increased public awareness about business opportunities and progress on actual project.
COMMUNITY PARTICIPATION AND OWNERSHIP	<ul style="list-style-type: none"> • More proactive in identifying and pursuing ownership opportunities. • Actively involved in tourism initiatives and create tourism attractions by showcasing their unique heritage and culture • Maintaining cleanliness in the towns and the natural environment. 	<ul style="list-style-type: none"> • Mentor SMMEs esp., black-owned tourism enterprises. • Collaboration with the SKA and SALT • Passion for the industry and participate in events. 	<ul style="list-style-type: none"> • Ensure communities are informed and involved. • Social cohesion. • Uplift poor communities and create more job opportunities. 	<ul style="list-style-type: none"> • Draft an agreement with the local communities • Educational programmes targeting local community/open days. • Train tour guides on astronomy and SKA projects.

STAKEHOLDER COLLABORATION AND INTEGRATED ROLES AND RESPONSIBILITIES	<ul style="list-style-type: none"> • Volunteer as tour guides linked to indigenous star gazing narrative. • Show support for one another • Seek involvement in the SALT and SKA community initiatives. 	<ul style="list-style-type: none"> • Link product offering with astronomy discipline. • Collaboration between businesses and implement strategies. • Closer work with Tourism Grading Council. • Collaborative effort and eliminate negative competition. • Participate in tourism structures and forums • Strengthen relationship with the SKA and SALT. 	<ul style="list-style-type: none"> • Cooperation with private sector. • Cooperative investment initiatives • Provide more funding opportunities for emerging and black businesses and expansions for existing businesses. • Lead stakeholder coordination and enabling environment for tourism. • Strengthen inter-governmental relations with key partnerships, tertiary education institutions in the Province • Increased interest and involvement in the tourism industry and capacity building workshops. 	<ul style="list-style-type: none"> • Make use of local businesses. • Organise events for local businesses and communities to participate. • Collaboration with local tourism businesses. • Strengthen regular communication with the public.
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Source: Researcher's own construction

6.4 CONCLUSION

This chapter addresses the empirical objectives reflected in this research study. The objectives of this research were fully identified and explained through the analyses and interpretation processes. The demographic and travel behavioural characteristics were discussed as well as the Importance-Performance Analysis (IPA). Data that was analysed and interpreted also identified strategies to capture a greater Astro Tourism market share. Furthermore, all the relevant role-players expressed their perceptions about the development of the Karoo as an Astro Tourism destination with regards to infrastructure and product development, local economic development and Pro-poor and stakeholder collaboration together with their roles and responsibilities.

The Karoo has a great number of available offerings but they need to be packaged and marketed as the “*star gazing region of South Africa*”. It is clearly indicated that Astro Tourism has the potential to contribute positively to the socio-economic conditions of the local rural communities. However, the Astro Tourism niche cannot be observed in isolation as it also requires improvements to the non Astro Tourism products and services in the region. The niche also needs to take realistic cognisance of the importance of a collaborative approach from all those who find themselves operating in the Karoo.

The next chapter presents the recommendations that are based on the empirical data analyses, as well as the overall conclusions of the study.

CHAPTER 7: RECOMMENDATIONS AND CONCLUSION

7.1 INTRODUCTION

The purpose of this study was to understand how rural development can be sustainably implemented and how tourism routes can play a pivotal role in niche market development. This study also explored astronomy in the context of tourism and how all these factors could possibly be utilised to uplift the socio-economic status of local communities. For this reason, the researcher proposes an Astro Tourism Route Development Framework based on the case study presented, although it is recognised that there might be a number of challenges in the implementation thereof. The findings of this study found that astro tourism might not be a sustainable development product as a standalone offering, but has the potential to contribute meaningfully, however minimally, to the tourism industry in rural areas.

This chapter revisits the objectives of the research study and the main findings from the literature. The main themes emerging in this section are subsequently discussed, namely, the visitor profile, tourism product development and infrastructure, local economic development and the Pro-poor approach, community participation and ownership, stakeholder collaboration and integrated roles and responsibilities. The themes in the literature as well as the foundation on which the Astro Tourism Route Development Framework is based, is discussed. Whilst the theoretical frameworks help to guide this research, the empirical research process led to the gathering of primary data on which the findings were built. This chapter includes the proposed Astro Tourism Route Development Framework which serves as a systematic and strategic method to develop an Astro Tourism destination in a developing and rural region.

The empirical research was carried out using a mixed method approach. For the quantitative component, questionnaires were conducted from amongst the visiting tourists. For the qualitative component, various research instruments were used to collect data from the relevant stakeholders including local community members, local tourism businesses and relevant officials from all three spheres of government, as well as key representatives in the astronomy and tourism industries.

The objectives which were addressed in the various chapters are as follows:

Objective 1: To investigate the factors that contribute to sustainable development in the rural context. This objective was addressed in Chapter 2 where the factors that contribute to sustainable development in the rural context were investigated. Sustainability was discussed in the context of a review of tourism and astronomy related policies and the methods to measure sustainable development.

Objective 2: To describe successful tourism route that are based on niche markets. The objective was explored in Chapter 3 by describing niche markets that are tourism route based. Various routes were considered in order to determine the most suitable and viable benchmarks and the related factors necessary for successful implementation.

Objective 3: To describe astronomy in the context of tourism with specific reference to Space Tourism and Astro Tourism; including a description of the contribution that Astro Tourism makes toward the Karoo as tourism destination in respect of the Square Kilometre Array and the South African Large Telescope. The objective was answered in Chapter 4 where astronomy was investigated in the context of tourism. This objective was addressed by looking at space tourism and Astro Tourism and the effect light pollution has on this specific tourism offering. Chapter 4 also included a discussion about the Square Kilometre Array and the South African Large Telescope at the Karoo tourism destination as this was central to the case study used for the research.

Objective 4: To determine the demographics and travel characteristics of visitors to the towns selected in the Karoo, in the Northern Cape Province. It was met through the quantitative component of the empirical research presented in Chapter 6. This included the demographics and travel characteristics of visitors to the Karoo in the Northern Cape Province.

Objective 5: To investigate tourists' overall perceptions and experience of the destination using an Importance-Performance Analysis (IPA). The objective was also addressed in Chapter 6 where the researcher investigated the tourists' overall experience of the destination by presenting the Importance-Performance Analysis (IPA).

Objective 6: To determine stakeholder perceptions of tourism development in respect of Astro Tourism activities in the region of the case study in relation to tourism product development and infrastructure; local economic development and the Pro-poor tourism approach; community participation and ownership; stakeholder collaboration and integrated roles and responsibilities. The last objective was addressed in Chapter 6, where the perceptions concerning the impact of tourism development in a Karoo region were identified. Perceptions were explored in relation to the four themes identified from the literature including tourism product development and infrastructure, local economic development and the Pro-poor tourism approach, community participation and ownership and stakeholder collaboration and integrated roles and responsibilities.

7.2 INTEGRATION OF THE MAIN FINDINGS IN THE LITERATURE

The degree to which the main findings extrapolated from this research is reflected in the following section.

7.2.1 Visitor Profile

The empirical findings of this study corroborate those of Olsen (2003) and Eusébio, Kastenholz and Breda (2014), that drive tourists enjoy themed routes, and as much as they want to get away from the busy city life, they also want to learn and experience new things in a unique environment. The success of Astro Tourism product development is mainly dependent on the degree to which advanced destination development and the governing systems are professionally integrated into the product. It was found that entrepreneurs and tour operators should initiate joint ventures alongside professional astronomers to improve their tourism packages. Professional inputs lay down a solid knowledge foundation together with an in-depth understanding of tourism markets and their demands. The mix of resources, support services and high quality Astro Tourism products should be carefully developed within a strategic plan and within a set timeframe (Fayos-Solé *et al.*, 2014).

With regards to determining the demand side of the respective niches, it is important to identify who visits the various tourism destinations and to determine the nature of the demographics and behavioral patterns of these visitors. By determining these

characteristics, an assessment can be made as to how visitors' experiences can be enhanced and how to develop unique travel packages. Travel packages are a necessity and should include both Astro Tourism and non-Astro Tourism activities in order to lure the visitor to stay longer. A longer length of stay will mean an increased tourism income for rural areas (Gössling *et al.*, 2016). The visitors' satisfaction index will give developers and tourism businesses an indication of the current status of the tourism industry in the area, the infrastructure improvements required and the quality of supporting goods and products. The findings agree with Weaver's (2011) statement that the main reason astro tourists travel is to observe and appreciate the naturally occurring celestial phenomena. These considerations should continue to be the focal point of destinations that have quality dark night skies, but this also means that the supporting tourism value chain have to provide quality services and high standards. No destination develops in isolation. Therefore, the tourism industry, through the establishment of a tourism association should pool all their resources to develop areas into Astro Tourism destinations.

7.2.2 Tourism Product Development and Infrastructure

The findings corroborate the importance of infrastructure as stated by various authors (see Sivijs, 2003; Marques & Santos, 2014; Rogerson, 2014; Ruddy, Gössling, Scott & Hall, 2015), along with the challenges faced by typical rural tourism settings as described by Briedenhann and Wickens (2004) and Govender (2011). The destination development strategy consists of both infrastructure and 'suprastructure' elements (Kovács & Nagy, 2013:224). Accessibility and bulk infrastructure all play a big role in upgrading the roads: whether or not they do so will have a huge effect on visitor numbers (Ingle, 2010).

Local tourism businesses and all the related sectors benefit from infrastructure development along the tourism routes and their support of new and emerging niche markets are vital for sustainability. Increasing the number of visitors as result of a sustainable tourism route will boost the local economy. Ideally, local tourism enterprises should gain a stronger voice as the tourism route association builds a strong collective marketing and branding identity. As mentioned before, tourism development cannot be sustainable if it is developed in isolation. Gartner's (2005)

method is applicable when a destination is approached holistically together with all the relevant stakeholders in a geographical space. Haukeland (2011) states that "... good governance is interaction among structures, process and traditions that determine how power and responsibilities are exercised; how decisions are taken and how stakeholders have their say".

Govender (2011) stated that Africa has great potential to grow Astro Tourism, and because of the quality of dark skies and visible starry nights, the tourism industry should take hold of this unique opportunity by all means at their disposal. As Astro Tourism is a form of Eco- and Nature-based tourism (Najabadi, 2012), the experience should be complemented with other activities that are unique to the area, such as Palaeo-, Agri-, Eco- and Nature tourism, adventure and outdoor activities as well as the culture and heritage of the local people. Astro tourists enjoy high quality amenities (Molokacova & Domaracka, 2011) such as hotels and restaurants and, most importantly, highly sophisticated and modern technology. The support structure and established product diversification through a tourism association would also strengthen the destination as would tourism route branding. A collective marketing and branding effort would also improve the destination's economic status and its competitive advantage (Binns & Nel, 2002; Bitsani & Kavoura, 2016; Chin *et al.*, 2016).

Knowledge gained from comparing case studies and observing niche market-based tourism routes in this study, serve as central to developing a framework for Astro Tourism routes. The current situation of the case study in this research emphasizes the importance for a collaborative approach between tourism businesses (Giordano *et al.*, 2012), along with the effective management system that guided the Midlands and Magalies Meander towards an inclusive tourism industry (Lourens, 2007). Furthermore, international case studies, such as the Camino de Santiago, demonstrated the importance of tourism routes in bringing development, entrepreneurial initiatives and the improvement of infrastructure to rural areas (after Rogerson, 2007). Other Astro Tourism routes such as the Astro-Chile and the EU Sky Route furthermore emphasise that an offering is usually supply driven and not demand driven and that a collaborative approach for sustainability is imperative. The fact that niche market-based tourism in rural areas is predominantly Pro-poor orientated correlates with the work of Marschall (2012) and is indicative of the potential role of Astro Tourism in this regard.

7.2.3 Local Economic Development and the Pro-Poor Tourism Approach

The rural tourism sector has shown to some improvement in respect of the local economic status and local economic opportunities for rural communities by being community based and private sector driven (Visser & Rogerson, 2004). Rural tourism routes have the ability to contribute to poverty alleviation through job creation and skills development for the unskilled, youth, women, emerging entrepreneurs and people with disabilities (Rogerson, 2006). In conjunction with local economic development, it is important that training and skills development are available for members of the local communities (López-Guzmán *et al.*, 2013; UNWTO, 2013). Skills development and training in the tourism economy improve the carrying capacity of the rural area as well as improving the local tourism product and offerings (Grefe, 1994:34; Trejos & Chiang, 2009:374).

An improvement in the quality of offerings and services will eventually lead to an increased number of visitors, a longer length of stay and a higher number of repeat visitors to the region (Ingle, 2010a). Early scholars (Aref, 2011; Belisle, 1983; Grefe, 1994; Scheyvens, 2007; Torres & Momsen, 2004) maintained that rural tourism complements agricultural activity. Agri-tourism provides the opportunity to supply the tourism industry with fresh produce and local food production, thereby meeting the goal for local suppliers to participate in the tourism value chain. Improvement in both the agriculture and tourism sector means an improved local economy in the respective rural areas. In the empirical research analysis, the tourism business representatives mentioned that they make use of the local farmers, but are faced with high prices and low quality of goods and services and the limited range of stock available (Kovács & Nagy, 2013). The tourism value chain is important in the rural context by including agricultural activities in its offerings, using local produce from the farmers as well as supporting businesses and by so doing, benefitting communities from the local tourism industry, both directly and indirectly (University of Zululand, 2012).

The readiness of a tourism destination can be analysed through the PESTEL (Stavros & Cole, 2013) and SOAR analyses (Fayos-Solé *et al.*, 2014). These methods were discussed and critiqued in detail in Chapter 2 and, thereafter, applied in the empirical findings described in Chapter 6.

7.2.4 Community Participation and Ownership

The study supports the view that active partnerships and ownership of businesses and products by members of the local communities are vital in sustainable tourism product development. An inclusive tourism sector and a positive attitude towards tourism development will enable sustainable tourism growth (Ashley *et al.*, 2007; Bitsani & Kavoura, 2014; Saarinen & Rogerson, 2014). The support and perception of the local community towards any development initiative is important for the successful implementation of tourism product development in rural areas (Muresan *et al.*, 2016). Ownership of tourism products will strengthen the local economic resources for community development in terms of tourism facilities and an improved quality of life (Chan *et al.*, 2016). Tourism however, does not necessarily bring overall change of ownership to the local communities. Unrealistic expectations need to be managed by the industry stakeholders and government sector through consistent and clear communication. Unfortunately, as Chan and Bhatta (2013) stated such interactions with the local communities take place close to the end of process and only at inadequate and inappropriately constituted formal forums. The local communities should be made aware of the opportunities of Astro Tourism, such as amateur astronomy and tour guides as possible entrepreneurial opportunities, and skills development and training should be transferred from the experts to the public and also from generation to generation (Najafabadi, 2011). In this modern world, the transfer of indigenous knowledge is very challenging as the generation gap creates resentment amongst the youth and a lack of appreciation of past traditions and customs.

The empirical data has demonstrated that intensive interaction and collaboration are needed between the relevant stakeholders in order to bring about greater development and more entrepreneurial opportunities to the Karoo (Binns & Nel, 2002 and Gartner, 2005). Another unique aspect of rural tourism and the Astro Tourism product offering is that the tourists and the rural communities exchange worlds (Van Rekom & Go, 2006). Modern astronomy can be linked with the indigenous Astro Tourism narrative and so the past and present become synergised as people enter into one another's lives. The authorities responsible for creating the enabling interactive environment have to bring these two "worlds" together and assist with the development and recording of such narratives. However, they have still not reached the point of

resolving the situation. This task is deliberated upon frequently, but ownership has yet to be taken.

7.2.5 Stakeholder Collaboration and Integrated Roles and Responsibilities

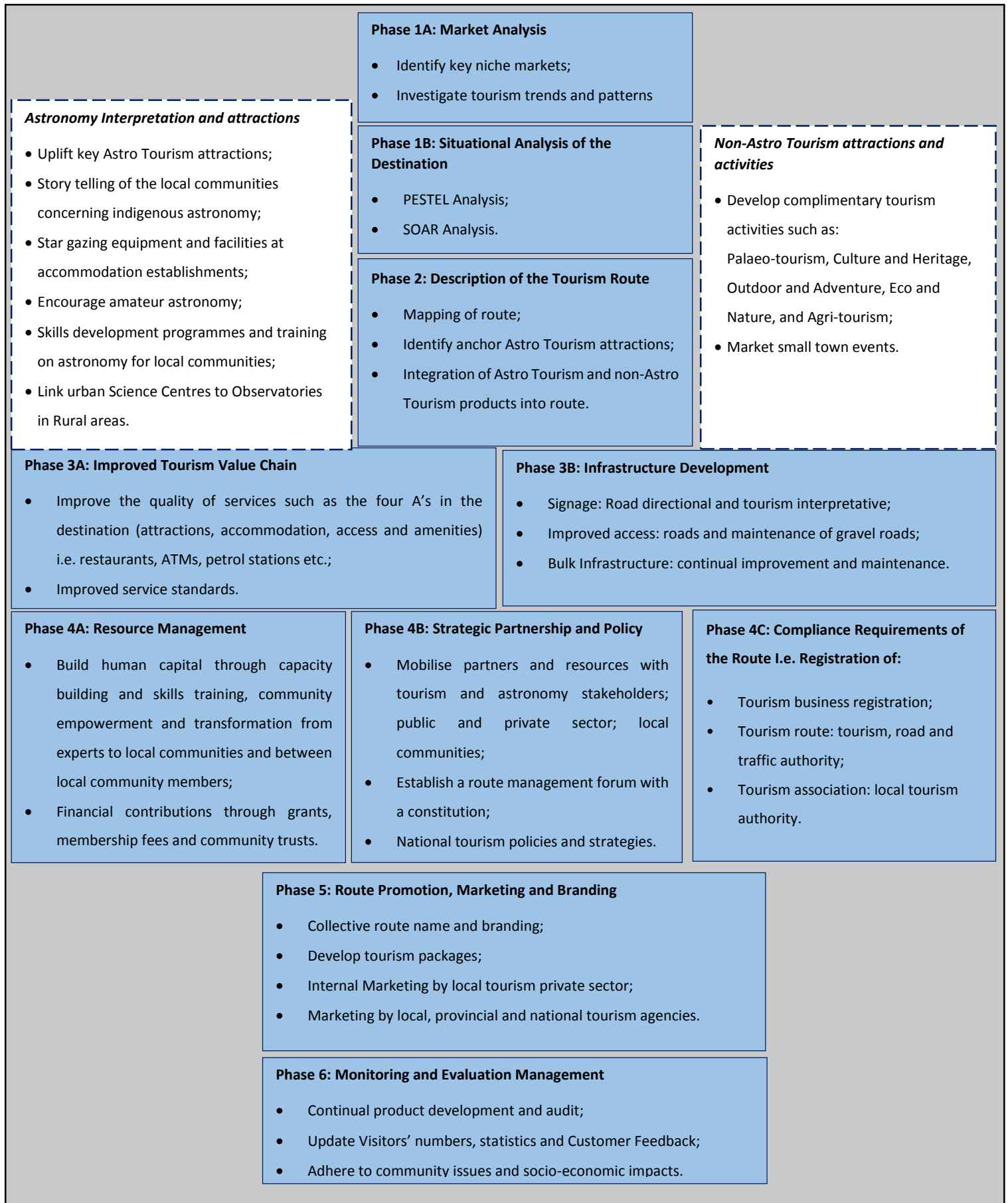
The importance of multi-stakeholder involvement is shown in numerous studies in the rural context (Eusébio *et al.*, 2014). The stakeholder theory statement by Lyon, Hunter-Jones and Warnaby (2017:237) reiterates that core stakeholders in any tourism development initiative are the tourists, local communities, entrepreneurs and local government or management officials. Stakeholder identification has been very important to this research study and, as also indicated by Lyon, Hunter-Jones and Warnaby (2017:237) as well as Rogerson (2012), rural tourism provides an opportunity for collaboration and inter-sectoral linkages. Through this process, inter-governmental relations and strong partnerships are improved (Suní *et al.*, 2015). The navigation of relationships in a multi-stakeholder project can be complicated. Thus, sensitivity and clear communication channels are essential. The findings of this study also address SDG 17's statement that global partnerships strengthen and revitalise the implementation of sustainable tourism development (UNWTO, 2015). The most important aspects of stakeholder collaboration and the allocation of roles and responsibilities are a reliance on accountability, commitment, active participation, interest, trust and communication (Liang *et al.*, 2008; Wilson *et al.*, 2009). The establishment of a formal structure, for example, a local tourism association whereby management, roles and responsibilities, including a vision and mission can be properly organised, is recommended (Viljoen *et al.*, 2010).

7.3 PROPOSED ASTRO TOURISM ROUTE DEVELOPMENT FRAMEWORK

The overall aim of this study was to produce an Astro Tourism Route Development Framework. The inter-disciplinary nature of the proposed framework seeks to address the objectives that are required to identify the opportunities available for Astro Tourism as a focal point for sustainable rural route development. The proposed framework is of paramount importance to position Astro Tourism as a potential keystone socio-economic initiative that aims to deliver tourism-led economic development in a destination. The six phases of the framework are a logical roll-out plan that could be

applied to implement any theme-based tourism route. The proposed framework is generic, but not static. Therefore, it can be tested and customised according to each specific destination that has the potential to promote astro tourism. It is important to note that there are a number of other variables and factors that have not been identified in this particular case study. The phases present a comprehensive approach that is built on the critique arising from the literature review as depicted in Chapters 2, 3 and 4 of this research study, as well as the data stemming from the empirical research reflected in Chapter 6. Importantly, numerous challenges exist as described in the literature study, particularly in respect of the collective approach, which is recommended in the proposed Astro Tourism Route Development Framework. Implementation of initiatives across all six phases should be considered over the long term and built on the aspirations and the collaboration that should take place between the multiple stakeholders. Stakeholder management is an issue, especially with regards to rural communities, as it is important to secure their involvement in the process from the onset (Chin et al., 2016; Eusébio et al., 2014). If implemented adequately, challenges can be mitigated through the framework. Figure 24 illustrates the phases that serve as guidelines for the implementation of the proposed Astro Tourism Route Development Framework.

Figure 24: Proposed Astro Tourism Route Development Framework



A detailed narrative and critique of the Astro Tourism Route Development Framework is presented in the following section.

7.3.1 Phase 1A: Market Analysis

The target market for the proposed route needs to be determined by means of market research to establish a profile of the people who are travelling to the respective regions and their associated expectancy and satisfaction levels (University of Zululand, 2012). The IPA analysis is, as demonstrated in this particular research study, a strategic research tool to assess visitors' experience and satisfaction (Gonçalves *et al.*, 2014). It provides some guidance for tourism product owners regarding all the amenities and tourism products offerings that would be required along the route. In this regard, market research provides an understanding of all the requirements associated with the development of a sustainable Astro Tourism route (as subsequently discussed).

The first phase of the framework investigates the supply and demand side of the destination. Demand refers to the market analysis and provides guidance regarding the visitors' needs, requirements and satisfaction levels, while the situational analysis provides insights into the state of readiness of the area to become a tourist destination. This phase is congruent with the work of Fayos-Solé, Marín and Jafari (2014), and sets the scene for developers to identify the strengths and weaknesses of the destination (Gonçalves *et al.*, 2014). This phase does carry the potential risk that the destination developers responsible for conducting the situational analysis may be biased and not entirely be truthful about the suitability of the area scheduled for development. This could create disjunction between the various stakeholders and their expectations and unsuccessful tourism products and offerings.

The travel behavioral patterns of astro tourists: through determining how travelers plan to embark on their journey, the areas in which development is required will become evident as will the supporting services in the tourism value chain that need to be improved, for example, restaurants, retailer and accommodation establishments.

Products complementary to astronomy: through marketing research, the proposed Astro Tourism Route Forum determines the products that complement the astro-tourist offerings and find synergy with the relevant stakeholders and sectors. Examples of this are the arts and cultural aspects that can be showcased by local communities

through informal street vendors, local festivals and events as well as curio shops at the information offices.

Complementary activities of astronomy: astronomy or Astro Tourism is found predominantly in rural areas that have a long history of agricultural industry. It would, therefore, be ideal to market Astro Tourism alongside Agri-tourism activities and outdoor and adventure activities as well as Eco- and Nature-tourism.

Infrastructure and services required for the Astro Tourism route and region: infrastructure development is required for any tourism product. Market analysis will generate information regarding the satisfaction level of visiting astro tourists; providing developers with a good understanding of those areas in need of urgent maintenance and improvement.

7.3.2 Phase 1B: Develop a Situational Analysis of the Destination

Apart from determining and mapping the tourism product offering, it is also important to establish the present state of the destination as well as identifying potential opportunities and lurking threats and assessing how the weaknesses of the prevailing conditions can be improved. This can be done by means of a SOAR (strengths, opportunities, aspirations and results) analysis of the destination as well as the PESTEL (political, economic, socio-cultural, technological, environmental and legal scenarios) analysis. These two classical analyses evaluate the internal and external factors that may affect Astro Tourism development either positively or negatively. The analyses will assist implementers to prioritise strategic issues in order to realise sustainable rural development goals, thereby achieving the region's maximum potential as well as addressing the state of readiness of the destination (Chaoprayoon & Panyadee, 2013; Fayos-Solé *et al.*, 2014).

The SOAR analysis includes a five to one (5-1) Approach, which stands for initiate, inquire, imaging, innovate and inspire to implement (Capela & Brooks-Saunders, 2008; Stavros & Cole, 2013). This approach has been applied to this research study and has led to the following conclusions:

- a) **Initiate:** continual communication and planning has to be done and led by the proposed Astro Tourism route association. Ongoing discussions with all the

relevant stakeholders are required. Clear roles and responsibilities have to be agreed upon.

- b) ***Inquire***: developers are required to provide a situational analysis of the current state of the destination and identify those factors that could deter or encourage economic growth. Once the analysis has been made, remedial actions need to be identified to mitigate these shortcomings and challenges.
- c) ***Imagine***: the Astro Tourism association is required to develop a collective value system in terms of which the relevant stakeholders are responsible to grow and market the tourism products as one unified body.
- d) ***Innovate***: as astronomy is perceived to be an intricate science, the Astro Tourism route association has to deliver a creative strategy drawn from the Astro Tourism offerings and seek ways to have practical, yet achievable programmes and plans in place to ensure inclusiveness and sustainability.
- e) ***Implement***: the strategy developed, including the practical programmes and initiatives, needs to be consistently evaluated and monitored against the goals and objectives through a continuous review process.

7.3.3 Phase 2: Develop the Tourism Product and Description of the Route

After assessing the tourism demand, the next phase is to match the demand with the appropriate tourism product offering. This offering should be unique, indigenous and one that mirrors the true characteristics of the rural area, its beauty and its people. The Astro Tourism products and offerings should be in synergy with the region, the landscape and the local community. The local environment must be valued in its purest form, with the tourism product being so unique that it gives a competitive advantage to the destination, but also being of sufficient scale to make significant contributions to the local economy.

7.3.3.1 Identify Anchor Attractions

The anchor attractions for the Astro Tourism route are those with the potential to attract the target market to the area. These attractions should possess those features and qualities that capitalise on the environment's competitive advantages. Currently, there are still insufficient Astro Tourism products along the route despite the fact that a tourist route has been identified as a viable commercial tourist product. The anchor

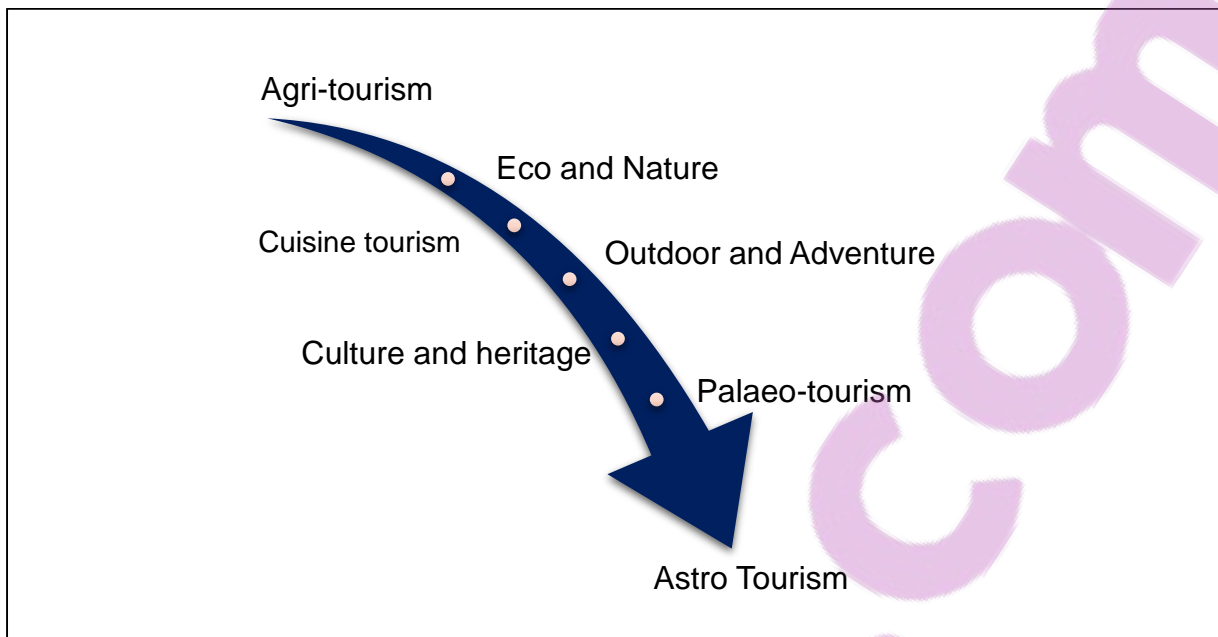
astronomy attractions should be identified, with regular upgrading of the surrounding attractions to lift the destination's reputation in order to reach a bigger audience with longer stays.

It is important to plan the overall astronomy route in conjunction with the governmental authorities as well as the astronomy project management, and as a collective, act as a curator to link the astronomy attractions with all the other potential attractions on the route. As astronomy is the focal point, it is important that all the Astro Tourism features are well demonstrated, developed and marketed. Proper research, exhibitions and interpretation material need to be developed in order to disseminate more information about astronomy and the associated celestial activities to create a greater public awareness and understanding of these phenomena. Local communities have a unique story about how they perceive the celestial phenomenon and they should make use of the tourism route for story telling purposes. Star gazing equipment is perceived as expensive by local tourism business owners, but there are a variety of affordable telescopes and pointers, available from local outdoor stores, that are suitable for beginners. Amateur astronomy is also possible and provides additional experiences for visitors at accommodation establishments. The stars are also very visible to the naked eye due to the quality of the dark night skies, so that local business owners can start to learn about the celestial features and activities and share them with their visitors, either informally or on a formal basis.

7.3.3.2 Integration of Astro Tourism and non-Astro Tourism products into route

The sustainable development of the Astro Tourism route product should include both the Astro Tourism and non-Astro Tourism products. Both of these aspects of the tourism route are very important as developing the astronomy element alone will not sustain rural route development (Gössling *et al.*, 2016; Najabadi, 2012). Astro Tourism needs to be complemented by the various unique hidden gems of the respective region as illustrated in Figure 25.

Figure 25: Integration of Astro Tourism as a focal point of the tourism route



Source: Researcher's own construction

The focal points illustrated in Figure 25 are elaborated on as follows:

- **Agri-Tourism** complements Astro Tourism as agriculture is often the largest industry in a rural area in general (Bwana, Olima, Andika, Agong & Hayombe, 2015; Torres & Momsen, 2004);
- **Culture and Heritage tourism** forms an important part of the rich history of the local communities;
- **Outdoor and Adventure tourism** is becoming an increasingly important event in tourist experiences;
- **Eco- and Nature-tourism** is self-explanatory with reference to rural and developing areas (Najafabadi, 2012);
- **Palaeo-tourism** complements astronomy very well as both improve peoples' understanding of the history and evolution of science. The tourism packages should be designed to intrigue the type of tourist who seeks to learn and understand the world around them; and
- **Cuisine tourism** is another untapped opportunity for the local community to demonstrate their local culinary specialties.

The second phase provides insights specifically into tourism product offerings, both in terms of the Astro Tourism products and the non-Astro Tourism products. It is

important that both are identified and mapped out, so that the destination can develop holistically (Gössling *et al.*, 2016). This phase could be a tedious and lengthy exercise as synergy between Astro Tourism and other related non-Astro Tourism products may not exist. If such synergy and linkages are non-existent, content development is required. This phase may require bids for the inputs of experts in the hope that such professional services are acknowledged as being compatible with the aims of the proposed Astro Tourism Route Forum. Another challenge is the need for holistic development in the region. Developers tend to view their projects in isolation, ignoring growth in other related sectors. Agri-tourism and Eco-tourism form a crucial part of tourism development in rural areas and should, therefore, be taken into account alongside Astro Tourism development.

7.3.4 Phase 3A: Improved Tourism Value Chain

The Astro Tourism Route offers tourists a new type of tourism experience. The tourism offerings on this route are specifically designed to educate the tourists about astronomy. However, as they are learning, they are also there for leisure. The quality of products offered and the quality level of the service is, most definitely, an immense influence on a visitor's travel experience and the possibility of return visits (Gartner, 2005). The third phase of the framework is to investigate the supporting aspects of the area, which creates an enabling environment for development. This is identified as the tourism value chain as well as infrastructure development (Gartner, 2005; Rural Tourism Strategy, 2012). Local municipalities are supposedly responsible for the creation of such an environment. However, as mentioned on numerous occasions in the theoretical and empirical data of this research, they themselves are frequently confronted by a lack of financial and human capacity issues that result in an inability to fulfill this function.

Quality and service are of such vital importance that the concepts require further discussion.

Quality of supporting tourism products: The industry should offer a range of accommodation facilities that cater for different types of people and size of budget in this niche market, for example, families, student groups and high-end profiled scientists. The quality of the local cuisine is imperative and the chefs and kitchen staff

need to be trained properly and given sufficient and adequate facilities and equipment. The general needs of tourists are access to information and basic amenities, such as petrol stations and ablution facilities. Each town on the route has to have a designated tourism information office that includes a decent curio shop, ablution facilities and a small restaurant (Okech *et al.*, 2012).

Service standards: López-Guzmán, Borges and Hernandez-Merino (2013) confirm that service excellence is demonstrated during the first interaction with the tourist, from the front-line staff to the cleaning personnel. Capacity building training and hospitality and customer service workshops should be made available so that all the interactions that visitors have with staff members are positive. The development of the route should also offer the local community the opportunity to enrich their livelihoods through SMME and entrepreneurial development and employment opportunities.

7.3.5 Phase 3B: Develop Sufficient Infrastructure

The following infrastructure is deemed essential for sustainable growth and development and is described as follows.

Road directional and tourism interpretative signage: directional and interpretative signage form a very important part of tourism route development. The fact that the route had poor signage between the various towns and tourist attractions was identified by most of the respondents. Directional signage needs to be erected under the leadership of the local municipality in order to give clarity to drivers by indicating the distances between towns (Kovács & Nagy, 2013; Okech *et al.*, 2012). Providing information on attractions through interpretative signage boards in towns and at tourism attractions contributes to the marketing and branding of the Astro Tourism offering.

Improved roads: the condition of roads is the most fundamental element in tourism route development. Poor and unpleasant road conditions are deemed to be a hindrance to the very target market that this destination wants to attract as such roads are most uncomfortable for both standard and goods vehicles. Infrastructure improvement is important to draw a bigger market to the destination (Binns & Nel, 2002; Chaoprayoon & Panyadee, 2013; Rogerson, 2004, 2006).

Provision of bulk infrastructure: access to basic services is crucial for any sustainable tourism destination development and route development projects. Supporting services such as water, sanitation, roads and electricity are not only important for the visiting tourists but also create an environment that is conducive to a sustainable tourism and hospitality industry (Akyeampong, 2011; Kovács & Nagy, 2013). It is further recommended that the private sector can provide physical infrastructure by making available the existing and under-utilised facilities for meetings, workshops and exhibitions such as municipal halls, public resorts and conference venues.

The next phase is crucial for an enabling environment to be sustainable.

7.3.6 Phase 4A: Effective Resource Management

It is important that all the resources be managed effectively. In this instance, the resources referred to are the human capital and the financial requirements for the entire tourism product development.

Build human capital: the human capital component includes community participation and ownership in the tourism sector. Capacity building training, business mentorship and skills development for local communities are critical for the implementation of the route. These initiatives aim to empower and create a suitable workforce by creating job opportunities and alleviating poverty. Empowerment through training and skills development will contribute to industry transformation and eliminate detachment between the local communities and the anchor attractions (Moscardo, 2014; Rogerson, 2004, 2006). Opportunities for community members to act as tour guides will increase as will the need for SMME development. A burgeoning tourism industry development requires supporting economic activities such as fresh produce, food and beverage and laundry services as well as transportation or shuttle services.

Financial contributions: financial constraints are always a main challenge to any rural development initiative (Lourens, 2007). It is important that this be tackled collectively through the Astro Tourism Route association. Finances are needed for road infrastructure, basic services, the upgrading of existing tourism attractions and facilities and the development of new supporting services. Members of the tourism route association should also be requested to pay a nominal membership fee,

approved by the route management. This fee could be used for the establishment of the route and prioritised activities such as brand design, route signage or collateral material. The membership fee is also an effective method to keep the tourism product agencies accountable for maintaining acceptable levels of quality and standards and to show commitment towards the growth of the local economy (Lourens, 2007).

Resources should be sourced for training and skills development and for the development of concept documents, business plans and commercial feasibility studies.

7.3.7 Phase 4B: Establish Strategic Partnerships and Policy

The framing of a constitution provides a framework for good governance without which not one of the phases can be managed. The components comprising this phase are discussed as follows:

Mobilise partners and resources: tourism product development is not sustainable if the institutional strategic partnership is not coordinated, implemented, managed and monitored. Strategic partnerships should extend across all sectors and inter-governmental departments. All the key role-players and potential stakeholders should be identified along with the expected roles and responsibilities of all involved (Cole, 2006; Meyer, 2004).

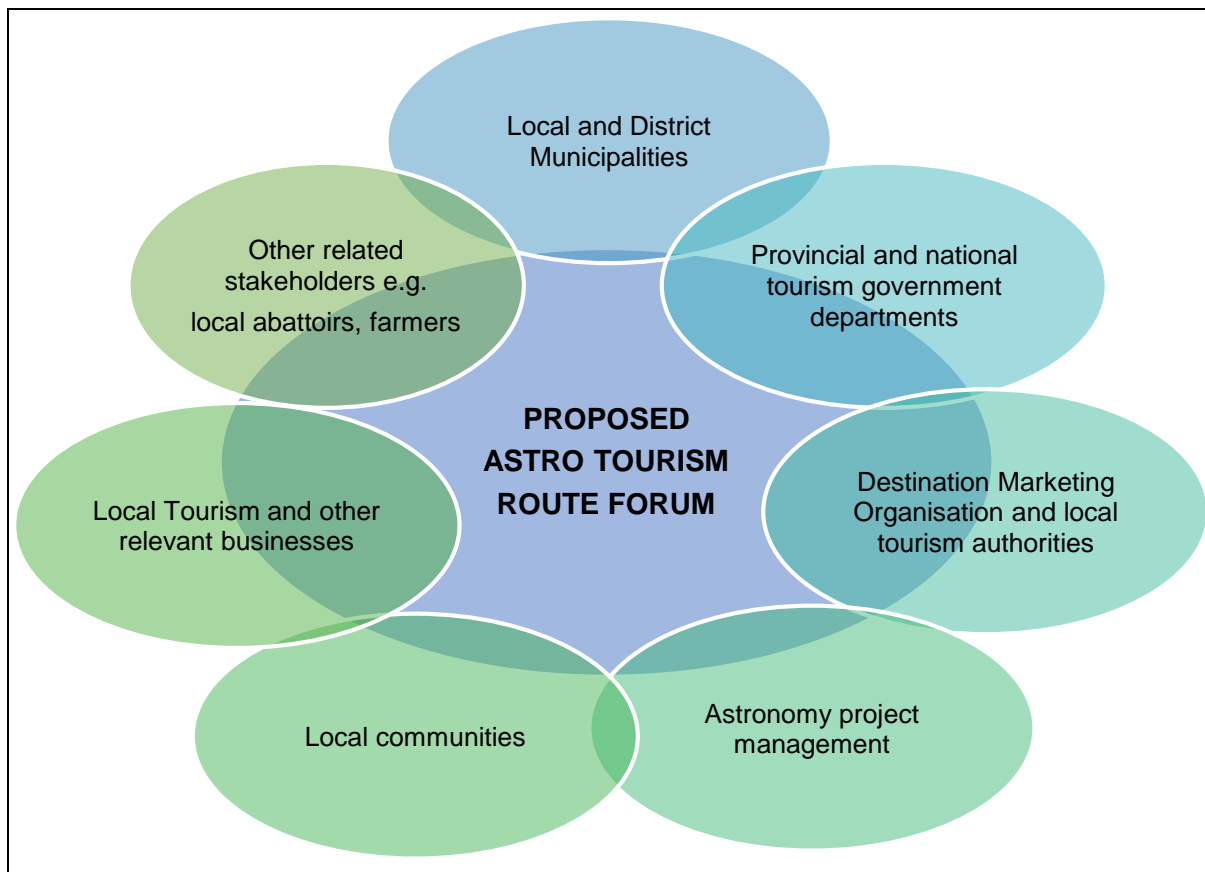
Establish an Astro Route Forum with a constitution: An holistic approach is paramount for the success and establishment of such a route and to get all role players and relevant stakeholders on board is essential. The identified stakeholders are accountable for the establishment of the Astro Tourism Route Forum as well as the implementation plan. For an Astro Tourism Route to be successful, prominent stakeholders should be recommended for positions in the stakeholder institutional structure. An official forum provides a coherent plan that includes inputs from all the relevant parties. The Forum needs to recognise that all competition is healthy and ensure that the vision and mandate of the route is strategically and systematically implemented. The route management team should have a clear and concise vision and mandate, with realistic objectives and desired outcomes. The implementation plan should include a meticulous budget with suitable timelines indicating roles and responsibilities that lead to specific tasks (Nowers *et al.*, 2002).

Nowers, De Villiers and Myburgh (2002) and McLaren (2011) state that the election of a champion is imperative in order to drive a sustainable route plan through the proposed Route Forum. The findings of this research study suggest that the champion of the tourism route should take on the position of chairperson of the Tourism Association as well. The responsibilities of the chairperson would then be made even more substantial, thereby fulfilling the administrative and executive roles and representing the tourism industry on various domestic and international platforms and tradeshows. The champion should be a self-starter, with tourism business experience, and have a knowledge of marketing, tourism product development and the tourism value chain. Compensation for the elected and appointed champion should be drawn from the membership fees of the Forum. Unfortunately, the local municipality may not have the funds to compensate the champion, but a budget, ring-fenced for tourism development of the region, could be allocated by the district or provincial tourism departments in accord with their LED function. However, this suggestion carries certain risks. The champion would be obligated to respond to instructions from the employer with the concomitant possibility of undue influence on the decision making process. Should an elder from a local community be considered for election as the champion, issues could arise in respect of insight, openness to social change and the fragmented nature of the local communities in the region as well as inexperience and a lack of knowledge about the tourism industry. These issues were not only observed by researcher as an internal observer, but also noted by Dabphet (2012).

Furthermore, it is important to understand that the forum is a voluntary body and members may be employed elsewhere. Other challenges include the establishment of a multi-stakeholder appropriately informed forum, the administration of which could be very time consuming. It may also be very difficult to achieve full attendance of the various stakeholders at the meetings, as the Karoo towns are vast distances apart and everything is dependent on priorities, budgets and the availability of resources.

Figure 26 illustrates the major stakeholders represented on the proposed Astro Tourism Route Forum or institutional structure, which is based on all the suggestions made by the various respondents who participated in the research study.

Figure 26: Proposed Astro Tourism Route Forum



Source: Researcher's own contribution

Alignment with national tourism policies and strategies: in order for the tourism route to be sustainable, it is critically important that it is aligned with the local and national government objectives and regulations (Gartner, 2005; UNWTO, 2013). This alignment will ensure that the tourism route is recognised and formally supported by the public sector, at both a local and national level (Rogerson, 2006). This will ease the process of lobbying for funds and buy-in of development initiatives in the respective rural areas (Picard, 2015).

7.3.8 Phase 4C: Compliance requirements of the route

This phase places emphasis on the various compliance requirements that are expected from the Forum (after Chang, 2011). The registration requirements mandate the tourism route forum to be formally registered with the relevant national business association, national tourism association, local tourism authority, as well as with the national roads agency. All these registrations are very important, but are usually an

overlooked component of tourism routes. The Forum has to act in accordance with all the logistical and administrative legal requirements for the route to be sustainable.

Phase 4 is usually overlooked, but plays an important role in the effective implementation of the route. Resources need to be allocated and provincial and national policies and strategies need to be aligned (Lourens, 2007; UNWTO, 2013). Alignment of governmental priorities gives the route the necessary leverage when assistance from the government sector is required. Yet, the three spheres of government are not always aligned and a disjointed government and leadership may cause many delays. Furthermore, in this phase, compliance with requirements for the route by businesses and the association is highly important. Compliance with these regulations provides the route developers with a solid case for the formation of partnerships and for gaining support from both the public and private sectors. After all the above mentioned aspects have been put in place, Phase 5 is initiated during which stage the route becomes a reality.

7.3.9 Phase 5: Route promotion, marketing and branding

This phase of the framework markets the tourism product offering most effectively for tourism consumption. It includes a collective route name and branding according to internal marketing, developing tourism packages and external marketing led by local, provincial and national tourism agencies (as subsequently discussed).

Collective route name and branding: the whole rationale of the route is to collectively promote and market the region within a specific area (Hashemi & Jusoh, 2015). The Astro Tourism Route Forum should agree on a unified route emblem and a Quadratic Residue (QR) code as well as placement cards or maps should be available at each establishment and attraction (Meyer, 2004; TOURage 2014, online). Collective branding is indicated through conspicuous signage and print media, that is, newspapers, travel magazines, banners and brochures as well as local festivals and events (McLaren & Heath, 2012). In the current era, digital media plays a critical role. The route stakeholders should make use of the various digital media marketing tools, such as Facebook, Google+, Instagram, YouTube and Twitter to market the area as a whole to the largest target market possible. Direct marketing plays a very important role in the overall marketing strategy, but unfortunately is not always sufficient. Passive

marketing and word-of-mouth endorsement are some ways that tourism destinations and products depend on to relay a positive message to others about their travel experiences. The tourist industry carries a specific responsibility for marketing their products in the widest sense of the word in the following ways:

- a) *Develop tourism packages:*** tourism marketing agencies should develop tourism packages that synchronise with the Astro and non-Astro Tourism product offerings (EU Sky Route Star Tourism Newsletter, 2015).
- b) *Internal Marketing:*** local tourism businesses have the responsibility, as members of the Astro Tourism Route Management Forum, to market the route through their respective business' websites and marketing initiatives (Lourens, 2007). This gives each business a crucial role to play in marketing the route to reach out to their existing and potential clients.
- c) *Marketing by local, provincial and national tourism agencies:*** tourism marketing agencies at local and national level have the obligation to market all tourism products to both domestic and international visitors, especially tourism products that could promote local economic development and job creation (Sivijs, 2003).

7.3.10 Phase 6: Monitoring and Evaluation Management

The last phase of the Astro Tourism Route Framework places emphasis on the sustainability of the tourism route by continually developing and auditing the tourism offerings and attractions, collecting and updating visitors' numbers, statistics and improving the offerings through the inputs of the consumers, and lastly, adhering to any concerns and socio-economic impacts of the local communities. These functions are conducted in a number of ways.

Continuous product development and auditing: in order for sustainable product development to take place, consistent monitoring and inspections should be done about the state of the tourist attractions and the quality of the products and services (Presenza, 2006). The 'implementers' have to conduct a product audit together with an identification of the existing products to assess their current condition and where improvements are desperately needed (Fayos-Solé *et al.*, 2014; University of

Zululand, 2012). From the empirical data, it was recommended that the product audit needs to occur every three to five years to measure the effectiveness of the route.

Update visitors' numbers, statistics and customer feedback: the demand side of the tourism product development should never be disregarded or overlooked. Tourism product owners and visitor information centres should have a foothold on their facilities and a visitor tracking survey where tourists are given the opportunity to give feedback concerning their visit, their highlights, recommendations for improvements and their satisfaction level (Fayos-Solé *et al.*, 2014). This will ensure that marketers and decision-makers are making intelligent decisions.

Adhere to community issues and socio-economic impacts: ultimately, it is the local communities that can grow or inhibit the growth of destination development. Local communities should be part of the decision making team from the inception stage of the planning to its implementation phase as well as the subsequent monitoring and evaluation phases (Chin *et al.*, 2016; Eusébio *et al.*, 2014). The local community should continually be informed and educated about the importance of tourism for economic development, job opportunities and entrepreneurial possibilities. Furthermore, the concerns of the local communities should always be considered with integrity and respect and cognisance taken of the potential impacts development will have on their day-to-day livelihood, whether it be negative or positive (Moscardo, 2014).

Phase 5 focuses on the collective branding and marketing of the route, followed by Phase 6 which is the monitoring and evaluation of the management process (McLaren & Heath, 2012). These last two phases should be undertaken continuously and be as flexible as possible on an ongoing basis in order to keep up with the evolution of the tourism product and the demands of the visitors. Developers should constantly scrutinise the implementation and re-packaging of the tourism product offering to ensure an evolving tourism niche market.

7.4 CONTRIBUTION OF THIS THESIS

The purpose of this thesis was to establish the potential role of Astro Tourism as a catalyst for development in rural and developing areas by means of a tourism route. The outcome of the study consists of the theoretical and practical contributions towards the realisation of this above mentioned purpose.

7.4.1 Theoretical Contribution

The findings of the thesis complement the development of tourism literature and are closely linked to international research trends in developing countries (Connell, 2007). This particular research provides new insights into the literature of sustainable tourism, rural tourism development and niche-based tourism routes. Sustainable tourism was examined according to local economic development, the Pro-poor approach, community participation and stakeholder collaboration in the context of the developing world with special reference to South Africa. These overarching subjects also incorporate the development of Astro Tourism. In conjunction with the literature, it is emphasised that any niche market such as Astro Tourism can contribute positively to the local economic development of a rural area. The empirical part of this study echoes the findings of previous literature, namely, that all the affected stakeholders should actively participate and especially involve the indigenous groups living in rural areas (Chin *et al.*, 2016; Eusébio *et al.*, 2014). The findings are also congruent with Butler and Rogerson's (2016) statement that "... inclusivity is an essential ingredient for the long-term sustainability of tourism destinations, particularly in the environment of the global South".

With regards to the theoretical analysis, this research contributed to the limited amount of literature about Astro Tourism as a newly developing niche market. The researcher furthermore made linkages to other and similar research fields such as space and celestial tourism.

Astro Tourism is closely tied to tourism routes as the related activities are predominantly found in a rural space, with minimal light pollution (Astronomy Geographic Advantage Act No, 21 of 2007; Ingle, 2012). Astro Tourism in rural areas is becoming more accessible as a result of the establishment of tourism routes. Accessibility is also linked to improved infrastructure, such as decent roads, adequate

directional and tourism interpretive signage, which come about as a result of the development of tourism routes (Kovács & Nagy, 2013; Okech *et al.*, 2012). The theoretical analysis, as well as the data analysis emerging from the empirical part of this study, shows that Astro Tourism cannot exist in isolation, but should be integrated into the unique character of the respective areas. This study reinforces the fact that relationships together with an integrated management approach are vital. Relationships form a core element in the sustainability of a tourism product offering and the longevity of a competitive rural destination (Ashley & Roe, 2002). Stakeholder collaboration and cohesive roles and responsibilities are key pillars found in sustainable tourism development ventures (Snowball & Courtney, 2012).

The study contributes to the understanding of relevant government policies that explicitly promote sustainable tourism development. The study also provides new linkages between sustainable tourism and astronomy as they pertain to a developing country (after Gartner, 2005; UNWTO, 2013). The theoretical analysis discusses a specific rural region and how its unambiguous charm makes it most appropriate for Astro Tourism development.

Astro Tourism route development framework: This study presents a framework, built on a firm foundation of literature that small-scale niche markets should not be overlooked, but valued for the difference they make to the livelihood and self-sustainability of rural communities. This research study complements the study conducted by Manwa, Saarinen, Athopeng and Hambira (2017:3), which demonstrates that the tourism industry is a vital vehicle for sustainable development. The proposed Astro Tourism Route Framework presents very specific phased-in guidance that can be considered by tourism decision-makers and developers to ensure sustainable development in rural areas. The proposed framework links the less familiar types of tourism within an area together by adding value to the existing local tourism products and offerings.

Development of the Framework was strengthened by a mixed method case study approach. It provided an in-depth analysis of a case study, based on multi-layered empirical research using a variety of research instruments for a variety of target populations. This methodology contributes to the reliability of the theoretical framework as being representative of a holistic approach to niche tourism development.

7.4.2 Practical Contribution

The study provides viable reasons for Astro Tourism development within rural areas. Derek Hanekom, Minister of the National Department of Tourism stated boldly that "... *the Astro Tourism route is a creative link between our origins of life on Earth and the origins of the universe*". To achieve the benefits of such a route for a rural area, the study provides practical guidelines that can be applied to any similar destination that endeavours to develop a niche market. This study provides a framework that potentially can influence policy and national strategies, predominantly on tourism routes, focussing on optimal beneficiation towards the local communities. The proposed framework provides a practical step-by-step application of a theoretically sound instrument that was developed from both theory and empirical data.

An important addition to the Framework is the proposed Astro Tourism Route Forum (Figure 21, p. 226). The guidelines indicate the most relevant format and functioning to ensure a well-resourced and representative Forum as driver of the Framework's implementation.

The construction of the Forum introduces concise guidelines to involve the various stakeholders with key actions within the different phases of the Framework. The Forum, if applied efficiently, can serve in developing various forms of niche tourism in similar rural destination settings. Such a forum supports the notion that an integrated approach is absolutely critical for tourism development to be sustainable (Kavita, 2014). This approach provides mutual beneficiation to local communities and tourism businesses as well as the decision-makers, where all these stakeholders are essential in creating an enabling environment for sustainable development and growth (Choi & Sirakaya, 2006). Importantly, rural communities should be acknowledged and actively involved throughout the implementation stages of all the development processes to ensure economically and environmentally soundly growth. The types of Astro-Tourism products that can be developed in order to ensure that communities participate fully and benefits from tourism are by being indigenous astro tourism and culture and heritage tour guides, respectively. Furthermore, the local communities can play an active role within the tourism value chain by providing fresh produce, local arts and crafts, laundry services and transfer and shuttle services. Destination development should thus be balanced by socio-cultural development needs and ecological integrity.

The local communities' buy-in, participation and understanding of the area as a tourism destination is critical for destination development.

Astro Tourism destination development: The application of the IPA analysis, SOAR and the PESTEL method served as significant tools to determine the current state of readiness of a destination for tourism consumption. The study supports the use of these techniques by developers of tourism routes and future researchers who have similar research objectives.

For rural areas, the tourism product offering is recommended to be conceptualised as both a developing and marketing plan undertaken as a collective venture. The unique experiences offered by Astro Tourism products cultivate the interest of the public in astronomy, giving the particular rural area a competitive advantage even within the international market. These products may also serve as a source of inspiration for the youth to become interested in science, mathematics and technology. Furthermore, it may give recognition to small towns as nostalgic places that have unique characteristics such as beautiful night skies, quiet surroundings and friendly communities (Bitsani & Kavoura, 2014; Van Sittert, 2002).

In relation to the case study, this study has contributed preliminary intelligence-based recommendations to the Karoo rural region. It is important that the Karoo rural node and especially the towns of Sutherland and Carnarvon, be developed as a science tourism destination, giving the region global significance (Van Sittert, 2002). Furthermore, this study offers practical insights into the Astro Tourism niche market of the Karoo. The demographics and travel characteristics of visitors to the respective regions provide tourism stakeholders with an exploratory analysis of the niche market and how they experience the region. This provides developers with an indication of the weaknesses and strengths and developmental needs of the rural region as a tourism destination.

7.5 RESEARCH LIMITATIONS

A number of limitations were experienced during this research process.

This research was cross sectional based and not conducted over a long term period. For this reason, it is not possible to investigate the success of the framework and how the process evolves over time.

The researcher was limited to visiting the Karoo as astrological site. It did not include other astronomical sites in South Africa such as the Science Centre in Cape Town, The SciBono in Johannesburg, the UniZulu in Richards Bay and Maropeng and the Cradle of Humankind in Muldersdrift, Johannesburg, which are the country's most renowned astronomy and scientific attractions. Investigating these sites, could have added value to this research study in respect of how they successfully draw vast numbers of domestic and international tourists.

Only tourism and astronomy stakeholders were included in this empirical research process and non-tourism businesses such as agriculture, taxidermy was excluded. It would have been exceptional if all the businesses, despite the nature of its offering and service, could have been included to provide an even more cohesive view of tourism development in the Karoo.

It is important that marketing research and credible data are available for tourism planners and management to make research based and informed decisions pertaining to development (UNWTO, 2013). Stemming from this statement by the UNWTO, a limitation with regards this study was that the lack of available baseline numbers and tourism statistics for visitors to the Karoo region of the Northern Cape Province. It was very difficult to determine what the most accurate sample size should be. Therefore, the research study had to be exploratory in nature. From a statistical viewpoint, the sample was small and presented limitations in terms of the analyses that could be carried out.

Due to the vastness of the scope of the Karoo area and limited number of visitors, it was very difficult to distribute questionnaires and collect the data. Despite the effort to recruit fieldworkers, it was just not successful, which led to a low visitor response rate.

The fact that local community members were reluctant to do paid fieldwork gives an indication on how difficult it was to entice the local communities to take a keen interest in the tourism industry. In addition, the area does not have any tourism information offices, therefore there was no hub where tourists could be found. As Briedenhann

and Wickens (2004) and McLaren and Heath (2012) rightfully indicated, tourism information offices are an important aspect of sustainable tourism route development. The local tourism businesses were also not willing to complete questionnaires in English, so they had to be translated into Afrikaans. Some of the businesses had no access to internet and some questionnaires had to be faxed to the establishments.

7.6 SUGGESTIONS FOR FUTURE RESEARCH

It is important to note that despite the theoretical and empirical contributions of this research study, it is not without limitations that should be taken into account when evaluating and making use of its findings. It is recommended that more academic research should be directed towards Astro Tourism and the related impacts the niche market brings to rural areas. Unfortunately, Astro Tourism is considered to be a small-scale operation in South Africa and its impact on rural development is yet to be recognised. Research on the relationship between astronomy, science and tourism is hardly saturated and the notion of the origins of the universe and the origins of humankind can be a great venture to investigate. What is also important is the difference between astronomy and scientific projects conducted in urban areas, compared to those in rural areas. The challenges are evidently different and the projects in urban areas are found in or nearby existing structures such as malls and parks with large numbers of people and the potential for high visitor numbers. On the other hand, rural areas are vast in distance and require much more aggressive marketing.

The proposed Astro Tourism Route Development Framework can be tested at other astronomical sites in rural areas, thereby confirming its usefulness as a tool that enables the promotion of sustainable rural destination development. It is also suggested that researchers can apply and adjust the proposed framework in other niche markets in rural and developing areas to determine its viability as a guiding instrument.

Baseline knowledge of the actual visitor numbers to the Karoo region is vital. In order to make decisions that are intelligence-based, research should be undertaken to determine the demographics and travel characteristics of the Astro Tourism target market. Such data is imperative for marketing and travel packages. This goes along

with undertaking research built on a larger sample size. This will enable statistical tests to determine the differences between the various target markets that could be attracted to the Karoo region. However, such data may be difficult to obtain, as the Karoo covers a vast area and the tourism product offerings are widely scattered across the region.

There is no uniform guideline for the development of tourism routes in South Africa. A national route strategy or framework should be developed and tested as a national initiative. It is therefore recommended that this process should be led by the National Department of Tourism so that route development is synergised countrywide, linking urban and rural communities and integrating tourism product offerings.

7.7 CONCLUDING REMARKS

The aim of this chapter was to revisit the objectives pertaining to this research study, recap the integration of the literature as well as present the proposed Astro Tourism Route Development Framework. This chapter elaborated further on the contributions of the study as well as its limitations and suggestions for future research.

The study achieves the purpose of describing how sustainable development can be achieved through effectively integrating a niche tourism product (such as Astro Tourism) into a destination's complementary tourism attractions and activities at the hand of a tourism route. The study shows the importance of infrastructure along with the quality of the tourism value chain and service standards. It reiterates the importance of stakeholder engagement across various levels within the destination to govern the processes of community empowerment and transformation. Pertinent aspects unique to a tourism route is applied to the context of Astro Tourism. Importantly, the study presents a theoretical framework through which a niche product can be developed following six distinct phases. Execution of the framework is strengthened through the establishment of an appropriate tourism route forum, with roles and functions as described.

This study provides an exploratory step in identifying Astro Tourism as a viable tourism product for sustainable rural development. This niche product fits in with the global trend towards the development of distinctive visitor experiences. Due to its unique

nature, the case study provided an ideal opportunity to explore the various dimensions of niche tourism in a rural context. The dark skies of the Karoo offer us a 'peephole into the cosmos' and places South Africa and the Karoo, for that matter, in a competitively advantaged position for astronomy and Astro Tourism (Ingle, 2010a; Govender, 2011). Astro Tourism is a unique tourism product offering and experience in South Africa and is worth showcasing to the rest of the world. It is the ideal way for local communities to get themselves involved and associated with Astro Tourism offerings and experiences in the fight against poverty in especially rural areas.

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APPENDIX 1:
Consent Form



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Economic and Management Sciences

**Informed consent for participation in an academic
research study**

DEPARTMENT of TOURISM

ASTRO TOURISM AS A CATALYST FOR RURAL ROUTE DEVELOPMENT

Research conducted by:

Ms LJL Van Wyk (student nr: 14312329)

Cell: 0737555669

Dear Respondent

You are invited to participate in an academic research study conducted by Laetitia van Wyk, a Doctoral student from the Department of Tourism at the University of Pretoria.

The purpose of the study is to investigate the relevance and efficiency of tourism route development in the Kareeberg, Ubuntu and Karoo Hoogland municipality, Northern Cape relating to SALT and SKA.

Please note the following:

- This study involves an anonymous survey. Your name will not appear on the questionnaire and the answers you give will be treated as strictly confidential. You cannot be identified in person based on the answers you give.
 - Your participation in this study is very important to us. You may, however, choose not to participate and you may also stop participating at any time without any negative consequences.
 - Please answer the questions in the attached questionnaire as completely and honestly as possible.
 - The results of the study will be used for academic purposes only and may be published in an academic journal. We will provide you with a summary of our findings on request.
- Please contact my supervisor, Prof Felicite Fairer-Wessels at ffairer-wessels@up.ac.za or co-supervisor, Dr Elizabeth Kruger at Elizabeth.kruger@up.ac.za if you have any questions or comments regarding the study.

Please sign the form to indicate that:

- You have read and understand the information provided above.
- You give your consent to participate in the study on a voluntary basis.

Respondent's signature

Date

APPENDIX 2:

Communication Letter to Principals of Local Schools



Februarie 2016

Die Prinsipaal

Geagte meneer/mevrou

VERSOEK OM FOKUS GROEP MET ONDERWYSERS OMTRENT TOERISME

Ek is 'n PhD kandidaat by die Universiteit van Pretoria en doen 'n studie omtrent die toerisme in die Karoo dorpie. Met die studie wil ek graag behaal wat die gemeenskap se persepsie is omtrent die SKA en SALT projekte, en veral in vergelyking met opvoedkunde.

Is dit Moontlik dat ek u skool kan besoek en 15minute se tyd van onderwysers (so 8-12 personeellede) kan hê vir 'n vinnige fokus-groep bespreking. Kan u asseblief aandui of die 15de April 2016 geskik sal wees en ook watter tyd van die dag u die beste sal pas.

Hoor graag van u.

Vriendelike groete,

Laeticia van Wyk

Sel nr: 073 7555 669

Epos: laevanwyk@gmail.com of lvanyk@tourism.gov.za

APPENDIX 3:
Response from Principle of Local Schools

From: "Gekombineerde Skool Williston" <gsw@hantam .co.za>

To: "Laetitia Van Wyk" <lvanwyk@tourism.gov.za>

Date: 2016/03/01 03:54 PM

Subject: RE: Focus groep met onderwysers- Toerisme

Hi Laetitia

Jy kan die skool besoek soos versoek. Die beste tyd is op 12 April om 14H00.

Hoop dit pas jou.

Groete
SKOOLBESTUURDER

From: Laetitia Van Wyk [lvanwyk@tourism.gov.za]

Sent: 29 February 2016 12:12 PM

To: hscarnarvon@gmail.com; gsw@hantam.co.za; kareeberglib@ncpg.gov.za; bhoorn@telkomsa.net; carnarvoncombinedkr@telkomsa.net

Subject: Fokus groep met onderwysers- Toerisme

Goeie more

Ek is 'n PhD kandidaat by die Universiteit van Pretoria omtrent die toerisme in die Karoo dorpie. Met die studie wil ek graag behaal hoe die gemeenskap voel omtrent die SKA en SALT projekte, veral omtrent opvoedkunde.

Is dit Moontlik dat ek die skole kan besoek en 15minute se tyd van onderwysers kan he vir 'n vinnige fokus-groep bespreking. Kan u asb aandui of die week van die 12-16 April 2016 geskik sal wees en watter dag u die beste sal pas.

Hoor graag van u.

Groete,
Laetitia van Wyk

APPENDIX 4:

**Permission Letter from The Northern Cape Department of
Economic Development and Tourism**



DEPARTMENT OF ECONOMIC DEVELOPMENT AND TOURISM
DEPARTEMENT EKONOMIESE ONTWIKKELING EN TOERISME
UMNYANGO WEZOKUTHUKISWA KOMNATHO NEZOKUVAKASHA
LEFAPHA LA TLHABOLOLO YA EKONOMI LE BOJANALA

Metlife Towers
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Tshupelo :
Isalathiso :
Verwysing :

Date :
Leshupelo :
Umhla :
Datum :
2015/03/25

Ms. Laetitia van Wyk
University of Pretoria
Pretoria
0002

RE: PERMISSION TO CONDUCT RESEARCH IN NORTHERN CAPE PROVINCE

Dear Madam

This here refers to your correspondence titled: **REQUEST FOR PERMISSION TO CONDUCT RESEARCH IN NORTHERN CAPE PROVINCE** dated 18 March 2015.

The Northern Cape Department of Economic Development and Tourism hereby grant you permission to approach a number of tourism stakeholders in the Northern Cape Province (Provincial, Local government and tourism businesses) for the purpose of conducting your study titled "*Astro tourism as a catalyst for rural route development*".

We look forward to the completion of the study as we are of the opinion that it will greatly assist our efforts as a department to fully understand the challenges faced by the provincial tourism sector.

For any further assistance please do not hesitate to contact Mr. A. Mlawu at amlawu@ncpg.gov.za or 053 8304862.

Regards


Ms. H. Samson
Programme Manager: Tourism



RESTRICTED

APPENDIX 5:

Research Instrument 1:

Tourist Questionnaire

Bestpfe.com

TOURIST PROFILING OF ASTRO TOURISM

1. What is your country of origin?

Outside South Africa	Country:
South Africa	Province:

2. If you're from South Africa, from which city did you drive?

3. If you're from outside South Africa, at which border did you arrive?

4. Is this your first visit to the region?

Yes	No, how many times have you been here before?
-----	---

5. For how many nights are/have you been staying in the region?

Day Visitor	1 night	2-3 nights	1 week	2 weeks	A month	Other (specify)
-------------	---------	------------	--------	---------	---------	-----------------

6. Please indicate which town (s) you will be visiting and for how many nights you will be staying in those towns?

Sutherland Nights_____	Williston Nights_____	Loxton Nights_____
Carnavon Nights_____	Fraserburg Nights_____	Other (specify) Nights_____

7. How would you describe the composition of your travel group? (Please tick in box)

Alone	Family	Friends	Student group
Tour group	Business Associates	Other (specify)	

8. What is your main reason for visiting this region? (Please tick in box)

Science	Academics	Volunteering	Education
Leisure	Business	Visiting friends and Relatives	Other (specify)

9. What was your main mode of transport?

Own vehicle	Rented vehicle	Mini Bus (Taxi)	Bus	Tour Bus	Motorcycle	Other, please specify
-------------	----------------	-----------------	-----	----------	------------	-----------------------

10. Will astronomical activities be your primary activities in the region?

a. Yes, please specify which activities will you be undertaking?

.....

b. No, please indicate why? (Please tick in box)

No time	
Not aware of astronomical activities	
Not interested in astronomy	
Other, please specify	

11. What will your other activities in the region be?

Adventure, please specify	
Visiting Culture and heritage sites, please specify which sites	
Attending an event, please specify which events	
Other activities, please specify	

12. What is your type of accommodation?

Hotel	Guesthouse	B and B	Self-Catering	Student hostel	Holiday Home	Friends and Relatives	Other (specify)
-------	------------	---------	---------------	----------------	--------------	-----------------------	-----------------

13. Which of the following listed influenced you to visit the region?

Word of mouth	School/ Tertiary Institution	Television	Posters/banners/flyers
Radio	website	Tourism brochure	Newspaper/magazines
Social media	Other (specify)		

14. Please indicate the **importance** of the following features:

FEATURES	VERY IMPORTANT	IMPORTANT	NOT VERY IMPORTANT	NOT IMPORTANT AT ALL
The quality of the roads				
Places of interest to stop en route				
Facilities at rest stops (e.g. food, toilets)				
Available tourist information and maps en route e.g. at garages				
Road signage to attractions				
Road signage to towns (e.g. distance to towns)				
Accommodation				
Official Visitor Information Centres				

15. Please indicate your **satisfaction level** of the following features during your trip:

FEATURES	VERY SATISFIED	SATISFIED	NOT VERY SATISFIED	NOT SATISFIED AT ALL
The quality of the roads				
Places of interest to stop en route				

FEATURES	VERY SATISFIED	SATISFIED	NOT VERY SATISFIED	NOT SATISFIED AT ALL
Facilities at rest stops (e.g. food, toilets)				
Available tourist information and maps en route e.g. at garages				
Road signage to attractions				
Road signage to towns (e.g. distance to towns)				
Accommodation				
Visitor information centres				

16. Please describe your most negative experience during your trip?
.....

17. Please describe your most positive experience during your trip?
.....

18. What is your overall satisfaction of your trip to the region?

Very satisfied	Fairly satisfied	Neutral	Fairly dissatisfied	Very Dissatisfied
----------------	------------------	---------	---------------------	-------------------

19. Would you recommend a road trip through this region?

Definitely would	Probably would	Unsure	Probably wouldn't	Definitely wouldn't
------------------	----------------	--------	-------------------	---------------------

20. When will you return to the region?

Next school holidays	Next event/festival	Not sure	Never again
----------------------	---------------------	----------	-------------

DEMOGRAPHIC PROFILE OF RESPONDENTS

21. What is your age?

<20	21-30	31-40	41-50	51-60	61 >
-----	-------	-------	-------	-------	------

22. Employment status/occupation.....

23. Highest education level completed.....

24. Gender: Male Female

Thank you very much for your time and for participating in this survey!

APPENDIX 6:
Research Instrument 2:
Government Sector Representatives and Industry Stakeholder
Questionnaire

GOVERNMENT REPRESENTATIVES ON LOCAL, PROVINCIAL AND NATIONAL LEVEL IN ASTRONOMY AND TOURISM, INCLUDING SALT AND SKA REPRESENTATIVES

1. Can you think of any short term (within 2 years) strategies to capture a greater Astro Tourism market share for your region?
 - a.
 - b.

2. Can you think of any longer term plans for improving the Karoo’s attractiveness as an Astro Tourism destination?
 - a.
 - b.

3. Do you think the local community has benefitted thus far from Square Kilometre Array and South African Large Telescope?
 - a. Yes, How?

.....
 - b. No, why?

.....

4. How do you suggest the local community can benefit even further from Square Kilometre Array and South African Large Telescope?

.....

5. What do you think, the role and responsibilities should be for the following stakeholders?

SKA Organisers	
The local community	
The government	
Local businesses	

6. What do you perceive as the major challenges with regards to tourism product development?
 - a.
 - b.

7. How can the above mentioned challenges be overcome?

.....

8. Do you think a tourism association that incorporate all tourism products and services will be successful?

Yes, How?

No, why?

Thank you very much for your time and for participating in this survey!

APPENDIX 7:
Research Instrument 3:
Focus Group with Local Communities

LOCAL COMMUNITY

1. Do you think the local community has benefitted this past year from SKA and SALT?

a. Yes, How?

.....

b. No, why?

.....

2. How do suggest the local community can benefit even further from SKA and SALT?

.....

3. What do you think, should the role and responsibilities be for the following stakeholders?

SKA Organisers	
The local community	
The government	
Local businesses	

4. What do you think is unique in the region?

.....

5. Do you think tourism can grow in this region?

.....

6. How can you get involved? And what would you need?

.....

7. What do you perceive as the major challenges in regards to tourism product development?

.....

8. How can the above mentioned challenges be overcome?

.....

9. Do you think a tourism association that encompass all tourism products and services will be successful?

a. Yes, How?

b. No, why?

Thank you very much for your time and for participating in this survey!

(FOCUS GROUP WERE FACILITATED IN AFRIKAANS)

PLAASLIKE GEMEENSKAP

1. In die afgelope paar jaar, het die plaaslike gemeenskap enige voordeel gebaat te danke aan SKA en SALT?

a. Ja, Hoe?

.....
.....

b. Nee, hoekom nie?

.....
.....

2. Wat sal u voorstel, hoe kan die plaaslike gemeenskap deur die SKA en SALT bevoordeel word?

.....
.....

3. Volgens u mening, wat behoort die rolle n verantwoordelikheid wees van die volgende rolspelers?

a. SKA bestuur	
b. Die plaaslike gemeenskap	
c. Die regering (plaaslik, provinsiaal en nasionaal)	
d. Plaaslike besighede	

4. Wat is uniek van die streek?

.....
.....

5. Is daar 'n moontlikheid/manier dat toerisme in die streek kan groei?

.....
.....

6. Hoe sal u betrokkenheid vind? En wat sal u benodig?

.....
.....

7. Volgens u mening, wat is die hoofsaaklike struikelblokke omtrent toerisme ontwikkeling?

.....
.....

8. Hoe dink u, kan hierdie struikelblokke oorkom word?

.....
.....

9. Dink u dat 'n toerisme assosiasie wat al die toerisme produkte en dienste saambind, suksesvol sal wees?

a. Ja, Hoe?

b. Nee, hoekom nie?

Baie dankie vir u tyd en deelname in hierdie opname!

APPENDIX 8:
Research Instrument 4: Tourism Businesses

LOCAL TOURISM PRODUCT OWNERS

1. In which city/town is your business located?
2. What products/services are you providing?
3. What influenced you to have a business in this area?
.....
.....
4. Can you think of any short term (within 2 years) strategies/tactics to capture a greater Astro Tourism market share for your region?
4.1
4.2
5. Can you think of any longer term plans for improving the Karoo's attractiveness as an Astro Tourism destination?
5.1
5.2
6. Does your organisation provide any astronomical events, activities, tours etc.?
6.1 Yes... please list and describe
.....
.....
6.2 No... please explain why?
.....
.....
7. Do you think the local businesses has benefitted thus far from SKA and SALT?
7.1 Yes,
How?.....
.....
7.2 No, why?
8. How do suggest the local businesses can benefit even further from SKA and SALT?
.....
.....
9. What do you think, should the role and responsibilities be for the following stakeholders?

9.1 SKA Organisers	
9.2 The local community	
9.3 The government	
9.4 Local businesses	

10. What do you perceive as the major challenges in regards to tourism product development?
10.1
10.2

11. How can the above mentioned challenges be overcome?

.....

12. Do you think a tourism association that encompass all tourism products and services will be successful?

10. Yes, How?

11. No, why?

13. Would you be willing to participate in such a tourism association for your region?

13.1 Yes 13.2 No

14. How many employees does your company have?

14.1 Permanent	
14.2 Casual	
14.3 During what time of the year do you hire casuals.....	

15. Are you as an owner a...?

Resident	
If resident, please indicate your ethnic group	
Non-resident	
If non-resident, kindly indicate your region of origin	

16. Do you as a tourism business make use of local farmers and suppliers for local goods and services?

16.1 Yes 16.2 No

16.2 If you answered no, please provide a reason why? (Please tick the appropriate box(es) and rate the level of importance: no importance (1), low importance (2) and high importance (3):

REASON FOR NOT USING LOCAL SUPPLIERS	PLEASE TICK BOX	RATE LEVEL OF IMPORTANCE
Lack of goods/services		
Unreliable suppliers		
Quality of products/services		
Tourism Preference		
Local prices		
Other, please specify why		

Thank you very much for your time and for participating in this survey!

(TRANSLATION INTO AFRIKAANS)

PLAASLIKE TOERISME BESIGHEID EIENAARS

1. In watter dorp is u besigheid geleë?
2. Watter tipe sort produkte of dienste lewer u?
3. Wat was die rede vir u besluit om 'n besigheid in die Karoo te hê?
.....
.....
.....
4. Wat moet gedoen word om die Karoo se skoonheid verder verbeter as 'n toerisme destinasie?
 - 4.1
 - 4.2
5. Volgens u mening, wat is die hoofsaaklike struikelblokke omtrent toerisme ontwikkeling in u area?
.....
.....
6. Hoe dink u, kan hierdie struikelblokke oorkom word?
.....
.....
7. Dink u dat 'n toerisme assosiasie wat al die toerisme produkte en dienste saambind, suksesvol sal wees?
 - 7.1 Ja, Hoe?
 - 7.2 Nee, hoekom nie?
8. Sal u gewillig wees om deel te vorm van 'n toerisme assosiasie?
 - 8.1 Ja
 - 13.2 Nee
9. Kan u 'n kort- termyn plan of taktiek verskaf wat gebruik kan word om 'n groter astro-toerisme mark na die Karoo te bring?
 - 9.1
 - 9.2
10. Verskaf u besigheid enige astronomiese aktiwiteite bv. sterrekyk? Indien Ja, verskaf asseblief 'n lys van die aktiwiteite; indien nee, verskaf redes hoekom nie.
.....
.....
11. In die afgelope paar jaar, het die plaaslike besighede enige voordeel gebaat te danke aan SKA en SALT?
 - 11.1Ja, Hoe?
.....
.....



11.2 Nee, hoekom nie?

.....
.....

12. Wat sal u voorstel, hoe die plaaslike gemeenskap deur die SKA en SALT kan bevoordeel word?

.....
.....

13. Volgens u mening, wat behoort die verantwoordelikheid van die volgende rolspelers te wees?

13.1 SKA bestuur	
13.2 Die plaaslike gemeenskap	
13.3 Die regering (plaaslik, provinsiaal en nasionaal)	
13.4 Plaaslike besighede	

14. Volgens u mening, wat is die hoofsaaklike struikelblokke omtrent toerisme ontwikkeling in u area?

.....
.....

15. Uit hoeveel werknemers bestaan u besigheid:

14.1 Permanent	
14.2 Tydelik	
14.3 Gedurende watter tyd van die jaar stel u ekstra tydelike werkers aan.....	

16. Is u as eienaar 'n

Inwoner van die Karoo	
Indien inwoner, wat is u etniese groep	
Nie-inwoner	
Indien nie-inwoner, vanwaar is u oorspronklik	

17. Maak u as 'n toerisme besigheid gebruik van plaaslike produkte en dienste?

17.1 Ja 16.2 Nee

17.2 Indien u nee geantwoord het, gee asseblief die rede daarvoor en gee ook aanduiding omtrent die vlak van belangrikheid: nie belangrik nie (1), minder belangrik (2) and baie belangrik (3):

DIE REDE DAT U NIE PLAASLIKE PRODUKTE/DIENSTE GEBRUIK NIE	MERK IN BOKS	DUI AAN DIE VLAK VAN BELANGRIKHEID
Gebrek aan produkte en dienste		
Onbetroubare verskaffers		
Kwaliteit van produkte en dienste		
Toerisme voorkeur		
Plaaslike pryse		
Ander redes, spesifieer asseblief		

Baie dankie vir u tyd en deelname in die opname!

APPENDIX 9:

Transcript:

Government sector representative: NAT1

TRANSCRIPT WITH NAT 1

The researcher provided the NAT1 with her professional and academic background as well as an introduction of the proposed research study.

Acknowledged the biggest challenge is the vast distance of the Northern Cape challenge

The opportunities are there and your questions are pertinent and you can record it, no problem. And all I'm doing is sharing some thoughts with you.

NAT1: The first thing is that you are right. The unemployment is rife in THOSE areas, it's not that it is underdeveloped in the same way as some rural villages in the Eastern Cape and they don't have the same challenges of no water like many villages like in the North West, Mpumalanga, are massive challenges such as sanitation, water, electricity, they don't have those same challenges None the less, poverty, unemployment. Those are the two things, and they are relatively well developed infrastructure wise. The point is, how do you change it, it is not easy because there aren't too many job creating possibilities there, economic potential is limited and mines and factories are not likely, only little attempts like abattoirs, biltong factories, what you have in the surrounds and sheep and cattle and game and really nothing much else. And obviously, the shell gas, we don't know really about it, it's a protected area, in regards with the geographic advantage area, you've seen about that, so no shell activity gas will be there but shell gas could be potentially contributing to our economic growth of our country, notwithstanding some of the concerns expressed by various stakeholders and would no doubt create some jobs in the Karoo. But not there, not in Brandvlei, Vanwyksvlei, Loxton, Carnarvon so the one thing, just picking up on the points that you made is true that many people drive to Cape Town you want to have more people stop and you the stop not only to be in Kimberley or Colesburg. Not that Colesburg doesn't have an unemployment problem, it does. And I think it's more excellent that people go via Kimberley rather than Bloemfontein. And Kimberley must develop its package to get people to stop and its very well with the mine, with the Big Hole Museum. The more stop people have on route to Cape Town, the better because its distributing the tourism spend and tourism benefits. So the question is, how do you get people to stop in Carnarvon, or one any of these place. the mere existence of the SKA, which no one will see in Carnarvon and you won't be able to get people to drive out there in numbers as you know the numbers would have to be limited so you have to do something that is SKA related in Carnarvon, which is why I really welcome the initiative that you were part of to establish this visitor centre. Thoughts that I have now shared with Bernie Fanaroff and Rob Adam, who is now taking over from Bernie and we need to consider that. You need to... firstly on the visitor centre itself, this, this visitor interpretative centre or even another one of the DST Science centres with specific focus and I believe it should be kind of a science centre. And I

think we should be looking at some kind of co-funding from DST but you can park that for a moment. It needs to be a science centre of interpretative centre of a different kind. Hmm because it's not just...because what is a science centre, sci bono in Johannesburg, they are really of great value to local learners as well as science centres in Durban, Cape Town. Well, this has to be of value more than just local learners and local schools. You have to ...it has to be impactful enough and attractive enough that

it gets people to stop ...it's a must do thing...not for everybody for enough people to say, well, you know consider a different kind of stop on your way to Cape Town. But then it can't be an in-and-out visit, it has to be an experience. So we have to take this one quite seriously, the ...it's very difficult for me seeing the first antennae in dishes in Carnarvon at the SKA Site and they are massive. You've been there, and you can tell people how big they are in metres and diameters, you know. It's an oh-wow thing. And I had a discussion with Bernie and Rob is the possibility of putting a replica life-size or full-size dish in Carnarvon. Because that's the closest anyone will come to see the actual dishes or most people will come.

LVWJ.... "SAVE' tourist that you draw and you cannot draw to the actual site...

NAT1: Well exactly, people go to Kimberley, because there is a massive hole and it's not as big and iconic as it was some years ago but it was a big attraction some years ago when I was a kid and then you put the museum around it and its all around the Big Hole. I mean you have the Cango Caves and then you put a museum around it that people go to the caves and you can aluminiate it so that people can experience that caves and the dishes are not...

NAT1: the dishes are not right there and it will become the iconic thing in Carnarvon. You will drive through the town and see this massive thing. It's a thought at this moment but it's something we need to explore. That will tell everyone in Carnarvon the story, and people will take photographs of it which makes it already different from other places. You go have an interactive, very informative interpretative centre, but it doesn't have that visual impact. So the visual impact will have that "oh-wow" and it will tell you, you can have models of the SKA or a dish inside the interpretative centre that you can even play with.

LVWJ: oh-wow

NAT1: No that will be great. I'm assuming we will be doing things like that inside it as it has to be interactive these days, you have to have people ...there has to be other things besides that such as information but we can get back to that later...but you can play with that dish fantastic but it won't give you the scale of it. Now once you go see this massive thing outside, and you imagine what 3000 of these are being constructed and then you realise this is big. You could even have the situation where you construct one of these, not with these sophisticated machinery, you can do it in much cheaper material, fibre glass, whatever you like and you could even consider it becoming a swivelling one. That people can, but it can become too expensive. But the main thing is to get the visual effect to have a sense of the scale. Dis die een ding.

NAT1: The second thing is, if you want to attract people to stop in Carnarvon. We going to attract already astronomers anyway and scientists, that's a given. What you've already seen is a massive increase in the property prices, more guesthouses now so it's already now more jobs in Carnarvon now than what we had before. Who own the guesthouses? who took advantage of it? As to be expected? The existing guesthouse owners just expanded, was there new entrances that saw this opportunities? No! they didn't have that advantage to jump in, they didn't have the capacity to, they didn't have the capital, so your existing... good that they have more jobs, no problem with that but your pattern of

ownership doesn't change at all. So you can't force that change either, but there is something that we can do, one is having been to Carnarvon a few times, in addition to what already exists, you want to attract, not going to be necessary the families' stayover but it might be. The existing guesthouses are more than adequate for the family stayover but you want people who really attract to South Africa to say, I am interested in astronomy, and it's not a small niche area, millions of people will have an interest in astronomy and fascination to say here's the biggest radio telescope in the world, we can't really go to the site but here we can see what this thing is all about. And it's not even that difficult. But then you need a slightly more upmarket type of accommodation there. Even for some of the top of scientists. I have had that discussion with DST. You've also got to get visiting Ministers and its difficult, it's difficult to get to ...so you want to actually have people there, have a session there and have a seminar room and they got it on site, but to have it at a guesthouse on site. I think there is argument for the stuff that we've done in other areas, would approach very cautiously, but some kind of partnership with the municipality or the local community trust that there is a "state owned" it could be IDC, but kind of a state owned guesthouse but not rubbish state owned. If you go National Empowerment Fund, you can partner with Protea and you go 30-30-30 partnership, 1/3 owned by IDC, 1/3 owned by Protea, 1/3 owned by the community. So it's a partnership of a different kind and it branding Astro Tourism, SKA Branding, so you got a place like that in Sutherland, there may even be more than one, they riding on the telescope, on the astronomy.

LVWJ: all their guesthouses are Skitterland and Jupiter, they riding on the name

NAT1: Yes, yes, yes and you want the SKA Name but you know people will go to the interpretative centre, they'll stop over and they'll spend two hours and they'll drive on. So you have to do more to attract them to stay there and spend the night. So that night, that kind of place, the local guesthouses won't like it, its competition, and the state entering, but it's just I'm sharing thoughts with you, and all of this requires some market research, and going on the spot and that place has to be one of these fabulous places to stay and obviously you've got to be sure you not going to get partners if you not going to be able to fill it. So the one has to go with the other. You have to get sufficient reason for people to wanting to stop with the big thing. ...and it takes me back to some ideas on the interpretative centre itself mentioned one that having these interactive things, but you're going there becomes your midway stop and it might even mean that going down to Cape Town you have more than one stop, that's what you want. Night in Kimberley, night in Carnarvon and from there it's not too long of a drive to Cape Town. Obviously there are other sites that are not astro-tourism related like the Karoo National Park outside Beaufort West, great place to go to, and visitor numbers has increased quite a lot and it's another good reason to stop and visit en-route before you go to Cape Town and that's just four hours and a half hour from Cape Town, maybe Carnarvon is about six hours but it's a drive-able distance either way. But then it has to be this place. One of the places that we stayed at, there was a place, nice rooms but the place didn't have a restaurant and you have to go to another place to the restaurant ..you know its little things like that you need to construct a place that does have a virtually a presidential suite with your e.g. your Saudi Arabian Prince that would want to see the place and spend the night or your Ministers, you can have more than one suite but not too many and the rest with adequate rooms but

that you cater for different kind of ...because of if you don't have that, the visiting Minister is going to fly in and fly out and not spend the night there, because accommodation ...so they will spend the night at a place nearby or not in Cape Town and fly in and out. But it's a great evening that they could have there and a place where you can have a lecture in the evening so you've done your with your family and because you can do a bit of night sky viewing, and they haven't really provided for that in the guesthouses currently,

LVWJ: not at all, only one or two in Sutherland indicated, but not in Carnarvon

NAT1: there is nothing wrong, maybe not at clear sky as Sutherland, which is remarkably clear but it's very clear one way or the other. No reason not to have a telescope to have people look up.

LVWJ...overflow of visitor

NAT1: Sutherland is what? The coldest place in South Africa, I learned that at school in geography and the snow is beautiful.

Also on the centre itself, also on the discussion with Rob and Bernie and the DG of DST, we cannot construct it just be an interpretative centre, most of the science centres that they have were placed in existing facilities, some were in shopping malls, this is a newly constructed place even sci bono is fantastic but it's in the shed warehouse type of thing and it's great, it works, but if you constructing a new place and you showcasing science you not only showcasing astronomy then it has to be the best of construction and the best of scientific construction, must be energy sufficient and top class energy sufficient, so whether it's the new batteries, and we can get those donations from

All of this of cause make this a more attractive stop. Now it doesn't stand forever, in ten years' time it will be. But for a while it will make huge impact. Let me use the Maropeng example. So Maropeng, the Cradle of Human Kind, the World Heritage Site, got declared a World Heritage Site, PPP build Maropeng. Maropeng wasn't a R20m building. Maropeng was a big PPP, and one architectural prizes worldwide so because they said look it has to be iconic, it got it right, and so it of cause it it's not showcasing astronomy and telescopes, its showcasing human origin, so it's a different construction, it's a different ambiance, and a different field place, showcasing the astronomy and SKA has to have the modern effect, even from the building, no reason you can't have a small observatory there, you know the observatory, you know that kids, it mustn't be a boring place, . the observatory would be, I mean you got big modern observatories, like in Cape Town and in Johannesburg, never been to but yes there is one but the observatory is the closest that kids will get to being told the story of the universe and whatnot- that's the virtual experience., you've got to create the virtual experience then, and you got to that kids then go from schools from all over. kids that do a trip, an educative trip to Carnarvon. If they not going to do it from Johannesburg, because they've got an observatory, from a huge, surrounding area that will be their opportunity to see some kind of observatory. We can't do it all with our own money, we will have to mobilise some money to it. I mean this is your PhD, but we have to do some serious design thinking for this thing, and serious interaction with DST, and it can't just be a partnership with Northern Cape. It must be a partnership that involves DST. Because the Northern Cape is not going to come up with all of this all on their own, so it's good if the Northern Cape is committing some money to

it if they can. You not going to get much money from municipality, because they don't have it. DST can commit some money into it and if we can get some donor support to get some money for it. Some private sector investment in it.

Short term:

It's difficult for us to create tourism awareness now. I think we should include it in our package, which we aren't and SATourism should be alerted to it, so that we can say what are the many things we can do. I agree with that. And Palaeontology is up on the map right now, and of the many things to do, Cradle of Human Kind, see the story of yourself, go to SALT, go to Carnarvon, see the story of the universe, but what you're doing there, and what your showcasing there is a fact that South Africa, is a world leader is something that nobody expects. You know, we've got good wines, we know we got these fossil evidence, but this fossil evidence happens to be there, we know we doing good in research, in palaeontology but the constructing of the world's largest telescope profiles us in a different way.

LWVJ,,,Chili's Astro Tourism is also growing fast...

NAT1...this will be by far the most powerful radio telescope in the world, and we will be able to do things, by a degree of magnitude, we will be able to do things that no other radio or optical radio telescope would have been able to do. It would be able to discover things that no other telescope can discover, it is remarkable.

Local community...

Information can be obtained from DST as the questions get asked repeatedly and they packaged the number of jobs, bursaries, support to schools in Carnarvon, computer laboratories at schools in Carnarvon etc.

The community will also say they don't benefit but they have benefit, but not each and every one has obviously benefited and not everyone will benefit.

Researcher...challenges...Tourism development...

You spoke about the Astro Tourism route, I think routes do work well if they are well thought out and well planned. you can have heritage trails and we haven't got the Mandela trail worked-it's a little but here and a little bit there, and this has to ...a wine route is simple, because you've got the wine farms central and you've got different routes that you can take and they can all be done in a day and somewhere you going to stop for lunch. This doesn't have hundreds of different places where you can stop but I believe that on its own its insufficient but I do think that that's argument for an Astro Tourism route which is one night in Carnarvon, when we ready for that one night, one night in Carnarvon, because at the moment they'll see nothing in Carnarvon. They'll just hear that there is an SKA somewhere, but when we're ready, it's a night in Carnarvon, and a night in Sutherland, and or a night in Matjiesfontein, and something like that. And or Karoo National Park whatever, but there is a route, I believe, finding the link, a creative link, between our origins of life on Earth, and origins of universe. And I say life on Earth, not only, only our human ancestor, which is what we've got, our greatest evidence

in any country and we not showcasing that enough. There is no country that has three species of our hominess in the cradle of humankind with this latest Homo Naledi discovery. All in one area, there is no other place, so we've got this huge story of where we all come from but we've got a much bigger story, and that's why there is an interpretative story going up in Golden Gate, it's the dinosaur story. But we've even got in the Karoo, there is huge evidence of pre-dinosaur life. Going long before dinosaur existed, they call it mammal like reptiles and there are lots of species. And in Graaf Reinet there is a little place, palaeontology. There is an opportunity to link these sciences. Hey you want the story of life on Earth, the origins of life on Earth, the story of the origins of the universe one goes back 4 and a half billion years the other goes back 14 and a half billions years back. So this here, we constructing here, is giving us.

I'm all in favour in packaging our wildlife experience because that's what Europe doesn't have to offer but what we have to offer, but we really must package our uniqueness and it lies in Robben Island, Cradle of Human Kind, World heritage Sites, incredible uniqueness lies in this astronomy and the knowledge that South Africa is generating through the most sophisticated technology in the world.

You know, favourite quotes "what does Africa have to offer humanity, African offers humanity itself, so that's the Cradle, it's the birthplace of all humanity. And that's no small thing, we wouldn't have been here to ask the questions, if we haven't evolved, on the African continent and migrated to ...talk on origins and their migrations...human migration started in Africa and that's the story we are not telling.

Astro tails astro mythology and their relationship with the stars.

LVWJ...thank you very much for making yourself available.

APPENDIX 10:
PICC Strategic Integrated Projects (SIPs)

STRATEGIC INTEGRATED PROJECTS	SIP TYPE	DESCRIPTION	TOURISM IMPLICATION
<p>SIP 1: Unlocking the Northern Mineral Belt with Waterberg as the Catalyst.</p> <p>SIP 2: Durban- Free State– Gauteng Logistics and Industrial Corridor.</p> <p>SIP 3: South Eastern node and corridor development.</p> <p>SIP 4: Unlocking the economic opportunities in North West Province.</p> <p>SIP 5: Saldanha-Northern Cape Development Corridor.</p>	Geographic SIPs	Mineral belt, roads, rail, ports, dams.	N12 West Coast, NW road construction, use of water for recreational purposes.
<p>SIP 6: Integrated Municipal Infrastructure Project.</p> <p>SIP 7: Integrated Urban Space and Public Transport Programme.</p> <p>SIP 11: Agri-logistics and rural infrastructure.</p>	Spatial SIPs	Municipalities, integrated transportation and agri-logistics.	Bulk services.
<p>SIP 8: Green Energy in support of the South African economy.</p> <p>SIP 9: Electricity Generation to support socio-economic development.</p> <p>SIP 10: Electricity Transmission and Distribution for all.</p>	Energy SIPs	Green energy, electricity generation and distribution.	Tourism facilities for the power station build e.g. Medupi.
<p>SIP 12: Revitalisation of public hospitals and other health facilities.</p> <p>SIP 13: National school build programme.</p> <p>SIP 14: Higher Education Infrastructure.</p>	Social Infrastructure SIPs	Hospitals, schools build and higher education.	Impact on the global competitiveness rankings.
<p>SIP 15: Expanding access to communication technology.</p> <p>SIP 16: SKA and MeerKAT.</p>	Knowledge SIPs	SKA/MeerKAT and broadband.	Space/science tourism niche development.
<p>SIP 17: Regional Integration for African cooperation and development.</p>	Regional SIP	Lesotho highlands water, electricity transmission from Mozambique, hydro power – Lesotho, Zambia.	
<p>SIP 18: Water and Sanitation Infrastructure.</p>	Water Sanitation SIP	10 year plan for the adequate water supply to 1.4m households and basic sanitation to 2.1m households.	

Source: PICC (2012)