

## CHAPTER 6

### RESULTS OF THE CASE STUDIES

#### 6.1 INTRODUCTION

Six case studies were chosen for the research project. These are as follows:

1. The Kruger National Park (KNP) was chosen as an example of a National Park. The KNP is the largest and most renowned park in South Africa managed by South African National Parks. The Park represents one of the outstanding examples of a National Park, famed world-wide, and it is justly described as the flagship of the South African National Parks. It is an important tourism destination for many visitors and offers a unique nature experience because of its rich wildlife and good infrastructure.
2. Pilgrim's Rest was chosen as an example of a conserved, gold-mining, heritage town and also because the old reduction works are currently being investigated for inclusion as a UNESCO World Heritage Industrial Site, a first in Africa. The date of submission was the 15 May 2004 under criteria (ii) and (iv) as a cultural category (<http://whc.unesco.org/en/tentativelists/1075>).
3. The Kromdraai Visitor Gold Mine was chosen as an example of a visitor mine; one of the first gold mines discovered in the Transvaal, even before the discovery of the Witwatersrand Goldfield in 1886. This will give an unparalleled view of historic gold mining methods.
4. Kimberley was chosen as a well-established diamond tourism centre, and because there is still small-scale diamond mining. South Africa has long been one of the leading diamond-producing countries in the world. According to Lynn, Wipplinger and Wilson (1998: 232-258), the biggest producing diamond mines are in Kimberley, Cullinan, Venetia, Alexander Bay and Kleinsee, while smaller producers are mainly found at the alluvial diggings in the North-West and North Cape Provinces. The country is well-known for its diamond deposits and mining, and lately for its cutting, polishing, jewellery design, manufacturing, and the role of diamonds in the country's economy. Diamond cutting and jewellery manufacture always fascinates and attracts visitors.
5. The Cradle of Humankind (COH) World Heritage Site (WHS) was chosen as a palaeo-anthropological area of immense significance. There are two newly established and excellent exhibitions, 1) Sterkfontein Caves and visitor centre, and 2) Maropeng, the official visitor centre for the Cradle of Humankind WHS, housed in and around the Tumulus Building. Maropeng is the official visitor centre for the

COH, and is responsible for the running of Sterkfontein Caves, one of thirteen sites in the COH area. They are registered as “*Maropeng a’Afrika Leisure (Pty) Ltd*”. The first of its kind in the world, the Tumulus is designed to look like an ancient burial mound from the front and, when exiting on the far side, a very modern structure from the rear. The architecture aims to symbolise the journey through time from mankind’s ancient origins to today. The site provides all that visitors can hope for at Maropeng: a 4-star boutique hotel, restaurants and an excellent conference venue. It is ideal for conferences, with three venues in the Tumulus building offering a combined seating capacity of up to 500 delegates. There is also a 5 000-seater outdoor amphitheatre and a 150m<sup>2</sup> temporary exhibition space within the Tumulus itself.

6. The Geoscience museum in the building of the Transvaal Museum, Pretoria, was chosen as an example of a museum collection.

During interviews with the respondents, Internet results about the places or products were discussed with the respondents to verify facts. Some of the answers of the respondents regarding a specific place or area were more comprehensive than were those of their colleagues. Additional information was obtained from the respondents that were not in the questionnaire, this applies to both the KNP and Pilgrim’s Rest. The responses were grouped together to be more user friendly. The finished analysis was then integrated in the results.

Because in four case studies, geotourism products are situated in protected places the guidelines, mainly directed at biodiversity, that were laid down by Foxley (2007: 44-70) are directly applicable to geotourism in South Africa. Each place needs its own plan that will describe how geotourism and visitor activities should be managed. Critical factors to be considered when trying to understand planning for tourism in protected areas include social, political and economic trends forming the background context for planning. It is important to develop plans for tourism detailing the specific goals and objectives mandated for the area in its founding legislation, and further to describe the objectives for tourism development.

## **6.2 RESULTS FROM THE CASE STUDIES**

The results from the interviews for the six case studies are given below.

### **6.2.1 CASE STUDY 1 – KRUGER NATIONAL PARK (KNP) - INTERVIEW RESULTS**

A personal interview using a questionnaire was undertaken with Dr. Peter Novellie, General Manager Park Planning, on the 10<sup>th</sup> October 2008, and with Mr. Joep Stevens, General Manager of Tourism Operations, on the 16<sup>th</sup> October 2008 at the Head Office of the South African National Parks (SANParks), Groenkloof, Pretoria.

### 6.2.1.1 Background and history

The Kruger National Park (KNP) covers an area of 1 948 528 hectare and is 350 km long from north to south, with an average width of 64 km. It is in the north-eastern part of the country, and borders both Mozambique and Zimbabwe.

In 1898, Paul Kruger, the president of the Transvaal Republic, created the Sabie Game Reserve in order to control hunting and protect the diminished number of animals in the park. The reserve was located in the southern third of the modern park. Shingwedzi Reserve was proclaimed in 1903. In 1926, Sabie Game Reserve, the adjacent Shingwedzi Game Reserve and farms were combined to create the KNP, which was opened to public visitors in 1927. In 2002, the KNP, Gona-re-Zhou National Park in Zimbabwe, and Limpopo National Park in Mozambique were incorporated into the Great Limpopo Transfrontier Park. The Kruger National Park is managed by the South African National Parks (SANParks). It is an outstanding example of the world's biggest and best-known National Park and is the flagship of SANParks. As a world-renown ecotourism destination, it offers a unique nature experience with the most game species of any park in Africa.

#### ❖ **GEODIVERSITY, GEOLOGICAL SIGNIFICANCE**

The geoheritage of the park consists of a diverse assembly of igneous, sedimentary, and metamorphic rocks together with unconsolidated sediments, which cover a time span of more than 3.5 billion years. There is a close relationship between the underlying geology, soils, vegetation and ecosystems that is neither emphasised nor well-enough publicised.

#### ❖ **GEOCONSERVATION**

Because the geosites, fauna and flora are part of the natural assets of the Park, they are being protected in the Park.

#### ❖ **OTHER, SUPPLEMENTARY, TOURISM PRODUCTS**

Picnic spots, the Goldfields Environmental Centre and museum (with an elephant hall and rhino exhibition) are facilities available, while the Thulamela, Masorini and the Albasini ruins are prominent archaeological sites. Activities in the Park include game drives (Big Five), stargazing evenings, bush braais (barbeques), bush walks, mountain biking and the Lebombo Overland ecotrail (used by 4x4 vehicles), wilderness- and backpack-trails.

### 6.2.1.2 Present status

#### ❖ **RESOURCE ANALYSES**

The KNP is well endowed with spectacular geophenomena. The geosites project was completed to document geosites in the park.

## ❖ HOW SUSTAINABLE GEOTOURISM IS BEING IMPLEMENTED

A printed definition of sustainability was given to every respondent before the interview, either by e-mail or personally. During the interviews, it became clear that sustainability was a concept that was not well understood. The respondents did not answer the query.

## ❖ SWOT ANALYSIS:

During the personal interviews with Dr. Peter Novellie and Mr. Joep Stevens (both of SANParks), very valuable information was obtained. The SWOT-analysis (Strengths, Weaknesses, Opportunities and Threats) proved to be very informative when forming an overview of key issues in the Park. Not every person gave the same answers; thus their responses were grouped together, and subsequently integrated in the results below.

### ▪ STRENGTHS

The strengths that were identified are:

- The Park is a world-class, nature based, tourism destination
- It is world renowned for the quality of scientific research
- The staff are world leaders in biodiversity conservation management
- A good infrastructure exists throughout the Park
- A sound planning for Park management exists
- The management is reputable
- There is a strong domestic market for tourism in the Park
- A well-established tourism market exists
- The Park has a world renowned icon and name
- An excellent website is available
- The Park has a rich biodiversity
- The Park has a large variety of geophenomena
- At present, the Park is part of the Great Limpopo Transfrontier Park (GLTP) together with Mozambique and Zimbabwe
- Alien species are being removed and attention is given to riverbed quality in terms of the preservation of the environment.

### ▪ WEAKNESSES

The weaknesses that were identified are:

- There is a lack of funding
- So far, only a mainly biological, world-class, tourism experience is offered
- There is a specific lack of funding from the provincial government to complete the complementary project of the Kruger-Malelane-Junction
- The construction of holiday homes on the southern banks of the Crocodile River outside the Park is contradictory to the purposes of the Park
- Problems with obtaining funding from a local company in Malelane for the publication of the Park guide

- There is nothing about soils or geology on the park's website.

## ■ **OPPORTUNITIES**

The opportunities that were identified are:

- The establishment of world-class, interpretation centres in all the camps
- The extension of activities in the Park
- Inclusion of information about geology and soils on the Park's website
- There is a potential to develop a vision that all stakeholders can support
- There is a potential for further appropriate development with many assets/attractions as a basis
- Examination of the possibility of attracting international funding for development of the area
- There is scope for the sustainable development in an holistic, integrated planning and management manner
- A potential exists for socio-economic development, job creation and training
- The potential exists to demonstrate the benefits of implementing good environmental management and development policies arising from biodiversity conservation
- The diversification of economic activity in the area
- Integration of the geotourism product into a greater regional, provincial and even countrywide strategy as a specialised niche market
- A KNP commitment and support exists for the geotourism initiative
- Local enthusiasm and support for the geotourism concept exists
- There is support from the scientific community in the KNP and in South Africa
- The area is large enough to plan and manage geosites intensively
- Undertake educational development and enhancement of geotourism
- Establishment of a close working relationship between scientists, managers, rangers and staff to understand intricate socio-ecological systems
- By increasing the KNP Ecosystem Area by SANParks to embrace the Transfrontier Conservation Area philosophy where considerable resources are available for this purpose
- The removal of fencing on the KNP border with Mozambique (about 370 km), as well as on approximately 60% of the western boundary of KNP, adjacent to the existing private nature reserves.

## ■ **THREATS**

The constraints and threats that were identified are:

- Land claims and restitution resulting in possibly fragmented land ownership
- Crime in the camps and at the entrance gates
- Lack of codes of conduct for tour operators, businesses and visitors
- Growing human populations and the needs for resources accelerate
- There are impoverished communities on the periphery of the park with huge

unemployment ratios

- Social pressures to provide natural Park resources to local communities
- Increasing political demands on the resources of the Park
- Poorly planned and rapid expansion of ecotourism, private concessions, holiday homes and private game viewing lodges adjacent to Park
- A significant emerging issue is the construction of holiday homes on the boundary of, or inside, protected lands
- Rising cost of fuel and food leading to a general increase in the running expenses of the Park
- World and local economic downturn
- If ecotourism development is permitted to occur in all claimed areas at the same level as currently occurring in the Makuleke area, it may severely impact the KNP
- Increasing political demands to fund conservation from tourism revenues places considerable pressure on conservation organisations to expand tourism facilities and products that, in turn, could lead to over-use of the resources
- Possible economic failure of the concessions because the price for accommodation in these areas is too high
- The Parks personnel can only visit the concession areas only a Wednesday, and that with prior permission, rendering quality control difficult
- Poaching of wildlife
- Trafficking of vehicles and goods on the main roads.

#### 6.2.1.3 Lessons learned

The respondents were unaware of geotourism, and the concept had to be explained to them. No strategic management plan for geosites exists, yet planning, management and marketing should be based on that strategic plan. The Park urgently needs more funding from the government. A further point is that the government focuses too closely on job creation and poverty relief, with the result that there is little available for conservation. Sometimes the World Organisations allocate funds for conservation projects. So far, the only financial support for this particular study came from the KNP itself in the form of free accommodation during the documentation of the geosites. No geoconservation legislation exists.

#### 6.2.1.4 Implementation of sustainability

Overseas research into experience in geotourism development should be undertaken. It is important to ensure that all decisions and proposals be made within a broad biophysical and socio-economic context with the explicit objective of ensuring environmental sustainability. To incorporate environmental sustainability issues into the geosites project, all other departments of the KNP should also consider sustainability issues.

Suggested sustainability objectives for the KNP include:

- Meeting both present and future needs
- Maintaining the productive capacity of natural resources and systems; and
- Maintaining a balance between human needs and the needs of the ecosystem in order to maintain the productive capacity. (This acknowledges that there are limits and requirements for balance).

A better awareness and knowledge of geotourism is a necessity. A well-prepared management strategy is necessary to implement geotourism.

Eber, MacFadyen and Venter (2007:1-38) classified the KNP in 2006 into five zones:

1. **Wilderness**
2. **Remote**
3. **Primitive**
  - Primitive Area (not concession)
  - Primitive - management
  - Primitive - camp
  - Primitive Area – Concession.
4. **Low intensity leisure**
  - Low – area
  - Low - gate
  - Low - transport
  - Low – camp.
5. **Remote**
  - Medium - camp
  - High - transport
  - High – camp.

The zones in the Park Management Plan of 2006 are more extensive, and are shown in Figure 6.1 ([www.sanparks.org/conservation/park\\_man/kruger.pdf](http://www.sanparks.org/conservation/park_man/kruger.pdf)) and it was described in more detail by Eber, MacFadyen and Venter in 2007 ([http://www.parks-sa.co.za/parks/kruger/conservation/scientific/noticeboard/science\\_network\\_meeting\\_2007/Tuesday/eber.pdf](http://www.parks-sa.co.za/parks/kruger/conservation/scientific/noticeboard/science_network_meeting_2007/Tuesday/eber.pdf): 1-38). Concession-primitive and low-intensity leisure zones were added. Although the geosites occur in all the zones, mainly along the tourist roads, they can mostly be seen during travel to a destination.

A starting point for the sustainable development of geotourism in the Park would be to educate the tourists more about the environment, especially geology, geodiversity, geoheritage, the interpretation of geology and the geological processes. A suggestion was made to obtain funds from Foskor and PMC at or near the Phalaborwa Gate. However, a display in a new building near the gate would be a better option than that of using the Bollanato centre in town. Discussions are currently underway to involve mining companies in the Phalaborwa area as stakeholders. An interpretation centre is envisaged at or near the main entrance gate. This will enhance networking in the area. Geosites are to be protected

like the fauna and flora in the Park. Promotion of their protection will be done by lectures, slide shows, audio-visual presentations, printed brochures and through material on the website.

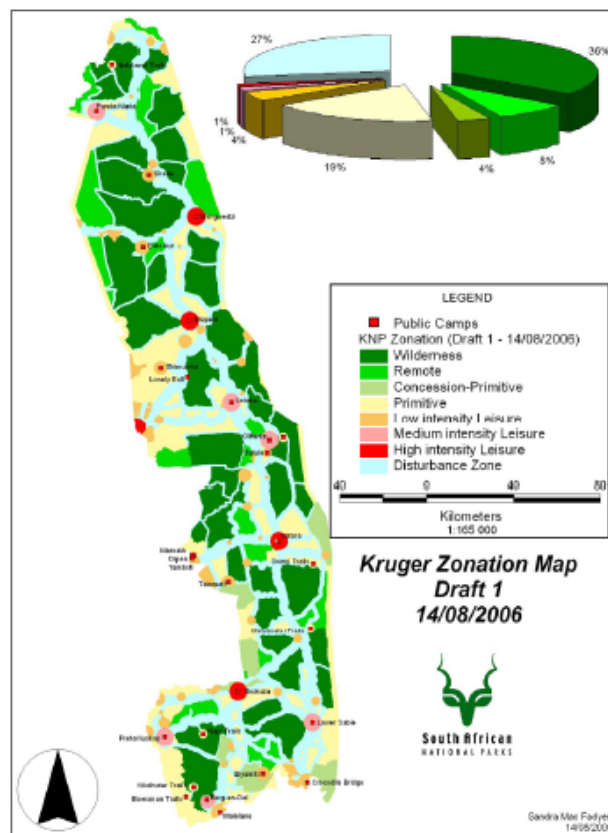


Figure 6.1: Kruger zonation map (provisional 1st draft August 2006) ([www.sanparks.org/conservation/park\\_man/kruger.pdf](http://www.sanparks.org/conservation/park_man/kruger.pdf):30)

## ❖ MANAGEMENT OF GEOSITES

Schutte and Booysen (2008:31, 41) state that the main objective of KNP management is to maintain the ecosystem in its natural state for the enjoyment and enrichment of visitors. The focus is mainly based on ecosystem management, administration and tourism. At present, the main emphasis of the Park's management plan is on biodiversity. Although geology is the basis of everything, it is not yet being emphasised sufficiently.

### 6.2.1.5 Benefits

## ❖ CONSERVING NATURAL HERITAGE

Because geology forms the basis for the soils, vegetation and ecozones it must be integrated into the curriculum of the future training of guides and game rangers.



## ❖ **CREATE OPPORTUNITIES TO WORK WITH OTHER TOURISM SECTORS**

Opportunities to work with other tourism sectors should be created and explored in the future.

## ❖ **ENHANCING VISITOR EXPERIENCE**

To enhance the geotourism experience, geo-education for the public, tourists, scholars and students should be undertaken. Stargazing will be integrated into the geotourism experience at Olifants Camp. Because of the solar eclipse on 4 December 2002 over the KNP, more camping places were made available for local and overseas visitors in the various northern camps of the Park. Thus, the Park obtained considerably more revenue than expected. The total solar eclipse could be observed over Punda Maria and Shingwedzi, and drew much international attention. This was an event that occurs only once in a lifetime.

## ❖ **GEO-EDUCATION**

According to the respondents, geotourism can be used for education and for a better understanding of geology that forms the basis of the park by:

- Educating the tourists further about the environment; and
- Promoting the geotourism concept.

Schutte *et al.* (2008:64) suggested that the following to be erected or displayed or made available in each camp:

- Geological maps and diagrams
- Geological exhibitions
- Open air geological museums
- Poster displays
- Integration of geology into the nature-based tourism experience
- Inclusion of geology together with stargazing at Olifants camp.

## ❖ **INTERPRETATION**

Geo-education, for the public, tourists, scholars and students, is an important element of geotourism, and is best done by interpretation. Geo-education should take several forms including plays and exhibits, printed brochures and maps, signage, audio presentations and guided tours. Interpretation is an important management function that helps to protect both resources and visitors, and promotes public understanding of the Park service management goals. Only when visitors understand the critical problems that threaten Park resources can they be expected to play a role in minimizing those problems.

Schutte *et al.* (2008:69) added the following as desirable additional educational resources:

- An interactive CD/DVD with photographs and rock descriptions
- Interpretive programs
- Posters behind glass in every camp
- Slide presentations in each camp of the Park
- Photographs
- Models of geological phenomena and fossils
- Geotrails in the bush with a game ranger to protect tourists from wild animals.

The respondents believed it would be wise to talk to the shop operators to sell the proposed guide, “*Tourist guide for the geology and geosites of the Kruger National Park*” in their shops. Tour operators too must be convinced that geotourism should be part of their packages.

#### 6.2.1.6 Future actions

##### ❖ **DEVELOP GEOSITES, GEOPARKS**

Development, management and eventual utilisation of the various geosites in the park should be critically evaluated according to the principles and implementation of sustainability. Geotourism can be used for geo-education and a better understanding of geology that forms the basis of the park. The following actions are important:

- A detailed CD/cassette tour with photographs and a description of rocks
- Contact must be made with the manufacturers of GPS software to landmark geosites in devices that can be purchased by the public
- Implementation of interpretive programs in the Park
- The mounting of poster displays behind glass so that the story from geology to ecozones of the Park can be shown and better understood. They could be erected at the entrance gates, reception desk, next or near to the restaurant/reception desk in each camp, and also at the various picnic spots
- Offering of video/slide presentations at various intervals in each camp of the Park. At Olifants Camp, there are already presentations using a telescope about the stars of the universe that can be seen from the camp.

##### ❖ **AWARENESS CAMPAIGNS**

An A4 printed park guide: “*Tourist guide for the geology and geosites of the Kruger National Park*” will be published in 2009. It will have chapters on the geological history, a detailed description of geosites, the relation between geology, soils, vegetation and ecozones, geoconservation and on geotourism. To accommodate the necessary maps, the booklet will show the geology on a 1: 250 000 scale similar to the present ecozones Park guide. The Park is divided in six regions from north to south and the maps can be seen printed in colour on

two adjacent pages when the guide is opened. Geosites are marked as 120 dotted numbers along most of the main routes and a visitor can stop at any place in the Park to read about the fascinating geoheritage. Three big A1 colour posters have also been made on a 1:500 000 scale. They are titled "*The geology and geosites of the Kruger National Park*", "*Geosites of the Kruger National Park*" (showing photographs of typical geosites) and "*The relationship between space images, topography, geology, soils, vegetation and ecozones in the Kruger National Park*". This last poster has smaller maps that will be placed next to each other on the same scale. These posters are intended for universities, schools and even businesses. At some later stage, these posters will also be erected as displays behind glass in each camp of the park. The guide and three posters will be sold to the public, and can be integrated into various activities and existing tours. By these actions, the importance of geology and geotourism will be highlighted. From the guide to the geology and geosites and the accompanying posters, the nonprofessional will learn how the Earth was formed.

Geological exhibitions and open-air geological museums are planned for each camp in the Park. The establishment and layout of open-air geological museums in each of the camps, entrance gates and picnic spots is planned. Large rocks and rock specimens will be collected in and around a camp and placed on show to typify the local geology. With each specimen, there will be a description. Tentative sites in the various camps for these museums have been identified. The planning and building of a geological interpretative centre at Olifants camp is an option for the future as the Camp's featured stargazing could be integrated with geology.

Monitoring of progress and feedback must be done continually. Awareness campaigns should be carried out also. Geotrails in the bush with a game ranger to protect tourists against wild animals are planned. Tours could be arranged, by prior booking, at places such as Red Rocks, the mini gorge east of Olifants camp and a few other stopping places in the southern portion of the park. Ideas can be gleaned by learning from what is happening at overseas geosites.

#### 6.2.1.7 Additional information

Saporiti (2006:2-3) believes that (SANParks), created in 1998 from the transformation of the National Parks Board, became a successful autonomous parastatal entity, a leader in the development of the ecotourism industry with high research standards. SANParks decided that it would not run commercial ventures but instead focus on its core function of biodiversity management. They developed the concept of "*Commercialisation as a conservation strategy*." One part of the strategy was the concession of exclusive rights to commercial use of lodge sites in the Park. The concessionaires obtained a 20-year contract for lodges (with no right of renewal or of first refusal on expiration) that include environmental and social obligations with penalties for non-compliance. The concessionaires pay SANParks an annual fee calculated as a percentage of the turnover bid during the tender process.

Therefore, the geosites and geotourism projects could be expanded into concession areas. It will be necessary to engage with the concessionaires and to convince them of the usefulness of the concept. They could perhaps be persuaded to make funds available for the publication of appropriate brochures.

Venter, Naiman, Biggs and Pienaar (2008:181) believe that a central challenge for conservation agencies is to establish realistic perceptions of the seriousness of the looming changes and so formulate appropriate management strategies. Therefore, adaptive management theory should be applied to complex systems. The KNP management process is designed to enhance understanding of complex ecosystems and broader social needs, thereby continuously improving the quality of decisions taken while minimising the possibility of being trapped in a circular, self-reinforcing capsule. Park management plans should also be developed through public participation (<http://www.springerlink.com/content/1776r2614w120561/fulltext.pdf>).

## 6.2.2 CASE STUDY 2 - PILGRIM'S REST – INTERVIEW RESULTS

A personal interview using a questionnaire was completed with Mrs. Judith Mason, an archaeologist, on the 6<sup>th</sup> October 2008, and with Mrs. Christine Rowe, the curator of the Pilgrim's Rest Museum, on the 7<sup>th</sup> October 2008 at Pilgrim's Rest. In addition to the responses to the questions, information about future World Heritage Listing of the reduction works was supplied by the respondents.

### 6.2.2.1 Background and history

Pilgrim's Rest is a small hamlet situated 1253 metres above sea level on the escarpment of Mpumalanga. The Sabie-Pilgrim's Rest Goldfield underlies an area extending in a north-northeast direction for some 140 km, with a maximum width of 30 km along the Great Escarpment of South Africa. The heart of this goldfield is about 800 km<sup>2</sup>, including the country between Sabie, Pilgrim's Rest and Burke's Luck. The geographical coordinates are 24° 54' S, 30° 45' E.

The town is now a Heritage Site and offers the visitor the opportunity to experience something of the life and times of an early South African gold mining community and industry. Today, Pilgrim's Rest reveals the life and times of those adventurous, hardy men and women who searched for gold. They were the pioneers of the largest gold mining industry in the world. Pilgrim's Rest is a perfect example of a prospector's town born during the romantic days of the gold rush.

Gold was mined and melted in ancient times in Southern Africa to a limited extent. Artefacts made of gold were excavated from sites such as Mapungubwe (now a World Heritage Site in the Limpopo Province), Klipwal (near Piet Retief) and Thulamela (in the northern part of the Kruger National Park). Unknown miners worked the quartz reefs for gold in ancient times.

Evidence of their diggings can still be found throughout northern and eastern South Africa and Zimbabwe. Gold was smelted by means of a furnace, probably similar to the iron and copper smelting furnaces excavated elsewhere in southern Africa, and was utilised for personal adornment as well as a means of barter for glass beads from Egypt, ceramics from China and cloth from Phoenicia (<http://www.geocities.com/Athens/6398>, Schutte (2003(a)), <http://www.sanparks.org/parks/kruger/people/heritage/thulamela.php>).

European prospectors found the first alluvial gold deposits at Eersteling (Limpopo Province) between 1840 and 1870, but the first major gold rush in South Africa, however, started on 5 February 1873 at Mac Mac, just 5 km from Pilgrims Rest as the crow flies. “Wheelbarrow” Alec Patterson, who pushed his belongings along in front of him, panned for gold in the stream running through the valley in 1873. Legend has it that one of the prospectors shouted with joy: “*Now at last, a pilgrim is at rest!*” After alluvial gold was discovered, diggers and gold prospectors from many parts of the world rushed to this valley to peg their claims, and to seek their fortunes. By the end of that year, there were about 1500 diggers working in the area. As a result, Pilgrim's Rest became the social centre of the diggings. Within a year, there were 21 stores, 18 canteens, 3 bakeries and all sorts of other establishments. In the first decade after proclamation, mining activities centred mainly on the recovery of alluvial gold. Gold was recovered from the stream and the banks of the river and creeks by means of sluice boxes and cradles. Mining was active until 1971 when the Beta Mine was closed down. It is estimated that over 200 tons of gold were eventually recovered during the course of mining.

#### ❖ **GEODIVERSITY, GEOLOGICAL SIGNIFICANCE**

Shallow, westerly dipping carbonate units are the host of the gold mineralisation. The gold mineralisation either occurs as concordant (flat reefs), or as discordant (cross reefs). Flat reefs, often very narrow, provided the principal source of the ore. Dating indicates that the mineralisation is related in time to the intrusion of the Bushveld Complex. In 1999, gold mining commenced again when TGME opened four new small gold mines in the area. These are:

1. Frankfurt mine near the Lisbon Falls
2. Dukes’ Hill mine (now approaching the end of its productive life)
3. Morgenzon (Clewer) mine (also approaching the end of its productive life), and
4. The Reduction Plant at the old Beta Mine.

#### ❖ **GEOCONSERVATION**

In 1974, the Transvaal Provincial Administration (TPA) bought the village. In 1986, the farm Ponieskranz, including the village of Pilgrim’s Rest town, was declared a National Monument. The National Resources Act No 25 of 1999 was promulgated for the management of national heritage resources in South Africa. Cultural natural sites were transferred to the local government as provincial sites and the sites are now managed by them (<http://www.sagoldpanning.co.za/history.htm>).

The entire village, the site of the first economically viable goldfield, has been conserved and restored as a living museum. It boasts beautiful examples of houses from the period of the gold rush, as well as an early mining camp and a complete reduction works. A dedicated group of historians and interest groups continue to work towards the further restoration of the village that will provide a better insight into the history of the area.

#### ❖ **OTHER, SUPPLEMENTARY TOURISM PRODUCTS**

Other tourism attractions in the Drakensberg Escarpment area are:

- Waterfalls (Bridal Veil, Horseshoe, Lone Creek Falls (just outside Sabie) Mac Mac, Berlin and Lisbon)
- Bourke's Luck potholes
- Sudwala Cave
- Sabie (the centre of the largest man-made forest in South Africa)
- The Blyde River Canyon (third deepest in world) lies within the 26 000 hectares of the Blyderivierspoort Nature Reserve, a 57 km narrow belt, which runs north from Graskop along the Drakensberg Escarpment
- The Three Rondavels
- God's Window
- Robber's Pass north of Pilgrim's Rest
- Kowyn's Pass. The unique rock formations next to the road on the left-hand side 21 km from Sabie are named Devil's Knuckles
- Long Tom Pass (with the Long Tom Cannon Monument) is along the Panorama Route
- Pilgrim's Rest Nature Reserve
- Mount Sheba Nature Reserve, south of Pilgrim's Rest, and is best known for its indigenous forest
- Hiking trails
- 4 x4 trails
- Horse rides and trails
- Mountain bike trails
- Golf courses
- Inner tube rides in the Blyde River; and
- Bird watching.

#### 6.2.2.2 Present status

#### ❖ **RESOURCE ANALYSES**

The village is divided into two distinct areas - Up Town and Down Town.

## 1. Up Town

- The Pilgrim's Rest Information Office and the Ticket Office in the Up Town sector offer tourist information
- The original premises of the “*Pilgrim's and Sabie News*”, situated between the present building and the Pilgrim's Hotel, was destroyed by fire between 1916 and 1919. The new building and printing works were erected at the present site of the Printing Museum. It is a tribute to the printing industry, including historical front pages of local publications
- The origin of the old cemetery is closely connected to the legend of the Robber's Grave. Early graves of the town's residents, showing the common causes of death in the town at that time, can be visited in the historic cemetery
- The Royal Hotel has beautifully renovated and furnished, with many attractions and activities nearby. The post office, the town hall, restaurants, craft and curio shops are all located in the original old buildings
- The Dredzen Shop Museum is representative of the typical general dealer of the period 1930 to 1950, and consists of a store stocked with a range of items in use nearly a century ago. The House Museum is a fine example of wood and corrugated iron architecture that is typical of Pilgrim's Rest.

## 2. Down Town:

- The Joubert Bridge on the edge of the village was built by an Italian engineer Galetti, in 1896
- In 1896, the increasing production of ore necessitated the rapid establishment of a central reduction works at Pilgrim's Rest. In 1897, the first buildings were erected consisting of a stamp mill, a smelting house and office buildings. An electric tramline was laid to convey ore from outlying mines to the central reduction works. The increasing demand for electricity created by the reduction works was one of the main reasons for the construction of the Belvedere Hydroelectric power station near Bourke's Luck in 1911. At the time, it was the largest power station of its kind in the southern hemisphere. Pilgrim's Rest was the second town in South Africa to be electrified, at a time when London was still using gas. The reduction works was expanded as gold production rose to record levels in 1913 and 1914 and continued to function through to 1959 when the machinery was adapted to produce fertilizer as a by-product. The reduction works closed in 1972 when the last mine at Pilgrim's Rest ceased production. In 1974, the run-down corrugated iron structures were restored and opened to the public as a museum. The Reduction Work Museum is now not being used and it should be restored

([www.saftour.co.za/pilgrimsrest.saftour.co.za/](http://www.saftour.co.za/pilgrimsrest.saftour.co.za/)).

Events such as the World Gold Panning Championship 2005 boosted the image of the town. The Championship is held annually, north of the caravan park, west of Joubert Bridge on the northern side of the Blyde River. Here, it can be both seen and experienced how alluvial gold

was panned in the river bed (<http://www.sagoldpanning.co.za/index.htm>, <http://www.sagoldpanning.co.za/history.htm>).

Guided tours are offered to two museums a few kilometres out of town, the Diggings Museum and Alanglade House. The latter was built in 1915 by the Transvaal Gold Mining Estates to serve as the official mine manager's residence at Pilgrim's Rest. It is furnished with objects from the period 1900 to 1930 using the first occupants, the Barry family, together with the Pilgrim's Rest milieu, as reference points. The furnishings reflect a modern Edwardian approach, and are mostly of Arts and Crafts, Art Nouveau and Art Deco stylistic origins.

#### ❖ HOW SUSTAINABLE GEOTOURISM IS BEING IMPLEMENTED

A printed-out definition of sustainability was given to every respondent before the interview, either by e-mail or personally. During the interviews, it became clear that sustainability was a concept that was not well understood. Again, in this instance, the respondents did not give an answer to the question.

#### ❖ SWOT ANALYSIS:

The SWOT-analysis (Strengths, Weaknesses, Opportunities and Threats) proved to be very informative in terms of gaining an overview of key issues regarding the mining heritage town as a well-known tourist destination. Not every person gave identical answers; thus their responses were grouped together and were then integrated in the results below.

##### ▪ **STRENGTHS**

The strengths that were identified are:

- The whole farm of Ponieskranz (including Pilgrim's Rest and the reduction works) is protected by law
- The Pilgrim's Rest Museum Staff do an extremely good job and, in effect, they are the backbone of the town
- There is a well established tourism infrastructure
- The Royal Hotel is a world-class establishment with good service and excellent meals
- The Central Reduction Works is the only of its kind in Africa
- The historic cemetery.

##### ▪ **WEAKNESSES**

The weaknesses that were identified are:

- A lack of resources
- The Department of Public Works of the Province is the landowner but cannot maintain the buildings of the town appropriately (although they are mandated to do this). Thus, the Heritage Act is not being implemented



- The Reduction Works is not open to the public and must be restored
- There is only one ATM in the building of the Highwayman's Garage in down town, and this closes at 18:00. All other clients of other banks must use this facility if it is available
- There are no volunteers working in the museums
- For 5 years, the provincial government was reluctant to provide finances for the upgrading of the Pilgrim's Rest museum
- The tarred road from the town towards the junction of the Graskop-Sabie road is too small and poorly surfaced. A completely new road should be constructed as part of the Highlands Meander, similar to the recently completed Long Tom Pass road that is comparable with the best in the country.

#### ▪ **OPPORTUNITIES**

The opportunities that have been identified are:

- The development of a geological museum in an existing building
- Posters that shows geology and mining activities should be erected in the information centre opposite the Royal Hotel
- The inclusion of the town as part of a UNESCO World Geopark and possible Panorama Route Geopark
- The organisation of guided mine tours
- The declaration of the reduction works as the first industrial World Heritage Site (WHS) in Africa. Contact has already been established with the German Government for the restoration and re-opening of the reduction works. Business plans have been prepared. Because too many alterations have been made to buildings in the town, the village itself will act as a buffer zone and only the reduction works will be a WHS
- An ATM should be installed Up Town, in the Royal Hotel
- All information about the town and its activities should be on a computerised system viewable by the public in the information centre opposite the Royal Hotel.

#### ▪ **THREATS**

The constraints that were identified are:

- The total provincial government control of the town for party political purposes must be avoided
- Care should be taken that the Gold Panning Championships, which is partly funded by the provincial Department of Culture, Sport and Recreation (DCSR), does not become used for party political gains
- Traders in shacks are not compatible with the character of the old mining town, and so should be moved to a suitable place, out of the town. A similar situation exists at the Strydom Tunnel further north

- Children, playing in the streets with homemade toy cars, are risking being hit by tourist vehicles
- Informal carwash entrepreneurs are operating in the middle of the town. The used water runs to waste down the main street. Many visitors are not happy about this for it is seen as detracting from the veracity of the historic site
- Global social, political and economic factors influence visitor management
- That change of names (such as that of the town of Lydenburg) is believed unnecessary and confusing to visitors
- The downturn in the economy.

#### 6.2.2.3 Lessons learned

School groups should be educated with hands-on displays about geotourism. Books and brochures must supplement this. Because there is neither a policy nor a strategic geotourism development plan, these should be addressed. The museum staff does an excellent job to plan and manage the town, effectively running the town. The town is amply supported by the local mining company, Transvaal Gold Mining Estates (T.G.M.E) that belongs to Simmer and Jack, who commenced gold mining on a small scale a few years ago. However, not enough support is received from the present provincial government to both maintain and upgrade the town and its facilities. No geoconservation legislation currently exists and so there is little or no political will to conserve geoheritage.

#### 6.2.2.4 Implementation of sustainability

To apply overseas research and experience in geotourism development is necessary. In Africa, or in many third-world countries, the principle of sustainability is not yet well understood. Better awareness and knowledge of the benefits of geotourism should be created, not only for visitors, but also for the local population who could be expected to reap the rewards.

### ❖ SUSTAINABLE GEOTOURISM STRATEGY

The following actions are necessary:

- Make more printed geological maps (scale 1: 250 000) available at the information office. They could be hung against the walls
- A metallogenetic map of the Pilgrim's Rest Goldfield will show the distribution of gold in the whole area. All the data is available in GIS and it should be made easily available to the tourist
- Publish a 1:50 000 map that would show all the old mines, diggings, gold bearing reefs, old 'batteries', accommodation, tourist attractions, historical places, waterfalls, and hiking paths as a permanent laminated wall map. The sites of the gold bearing reefs should be emphasised. It was suggested by the museum personnel that not too

much information should be given on one map. Therefore maps showing different categories of tourist information can be made available

- Show old photographs that depict the history of the town in the information office;
- Make posters and aerial photographs of the whole area, and put them in the information office or at strategic places, to enhance the visitor experience
- At the Diggings Museum south of the town, a display of old photographs was planned and improvement plans were submitted by the museum staff to the provincial authorities. However, no positive response has been forthcoming for the intervening five years
- Print brochures that explain the geology and mining history for the visitors; and
- Upgrade the existing topographical and other models in the information office to aid easier interpretation of the information provided
- Begin an open-air geological museum of all the rocks and minerals of the area, but only in an existing building as no new structures are allowed in the town. All the geosites on the farm Ponieskranz are automatically protected as well as the town of Pilgrim's Rest and the Central Reduction Works. An alternative site could be the Mac Mac Falls east of the town.



Figure 6.2: Entrance to the open air Diggings Museum, on the Sabie road, south of Pilgrim's Rest

Sustainable geotourism development should be vigorously addressed because no-one really seems to understand the concept of sustainability. The various stakeholders are the Department of Public Works and the Department of Culture, Sport and Recreation (Heritage Section) of the province, the tourism sector and the T.G.M.E mine. Better networking has to be established between them if the issues of sustainability are to be successfully addressed.

By means of the South African National Gold Panning Championships, promoting gold panning, in effect, means supporting heritage conservation and bringing a part of the country's heritage into a new and vibrant perspective. It is a "*live one's heritage*" experience

that gives the country's public the opportunity to be in touch with an exciting part of history in a very tangible way.

The respondents stated that marketing is done at relevant tourism events, that is, at the Tourism Indaba in Durban and at travel shows. A better, more focussed, marketing effort is necessary and should include pamphlets, brochures, booklets, TV programs, together with articles in journals. The question must be asked, who will undertake this on a continuous basis?

#### 6.2.2.5 Benefits

##### ❖ **CONSERVING NATURAL HERITAGE**

The town of Pilgrim's Rest is an example of how mining heritage is conserved and enjoyed by tourists.

##### ❖ **CREATE OPPORTUNITIES TO WORK WITH OTHER TOURISM SECTORS**

At the 1997 World Panning Association's Annual General Meeting. South Africa applied for membership and became the twentieth member country of the Association. South Africa was subsequently represented at the World Gold Panning Championships in Italy, Czech Republic, Poland, Australia, Japan, Switzerland, Slovakia, the 2005 European Championships in Spain, World championships in Finland, the European championships in Austria and the 2007 World Championships in Canada. The 2005 World Gold Panning Championships were hosted in Pilgrim's Rest. This is an example of how all stakeholders working together can facilitate participation in Gold Panning Championships. The creation of opportunities to work with other tourism sectors in South Africa is an opportunity that should be investigated.

##### ❖ **ENHANCING VISITOR EXPERIENCE**

The museum of the town is doing excellent work by publishing many brochures and informational material, as well as by organising visitor tours. By this, mining heritage is being interpreted to the visitors. A visit to the Information Centre, which is itself a museum, is most worthwhile to stimulate the visitor experience. The displays are excellent. Events such as the World Gold Panning Championships 2005 boost the image of the town. The South African National Gold Panning Championships in October is now an annual event. Even so, there is a lack of funding from the provincial authorities.

For successful tourism, the character of the town as stipulated in Act 25, 1999 should be implemented. Traders in home-made shelters do not enhance the touristic character of the old mining town. For this reason, suitable alternative accommodation must be found.

#### 6.2.2.6 Future actions

##### ❖ **DEVELOP GEOSITES AND GEOPARKS**

Geosites cannot be developed on Ponieskranz because the whole farm has been declared a provincial site. However, there is an opportunity to construct an open-air geological museum next to the parking place at Mac Mac Falls as it is already being protected.

##### ❖ **BETTER INTERPRETATION FACILITIES**

Better interpretation facilities are planned for the museum. Monitor progress and feedback should be done continuously. Awareness campaigns should address the nonprofessional. Geo-excursions, seminars, and lecture programs must begin at school level with hand-on displays and experiences.

#### 6.2.2.7 Additional information

During the interviews, a copy of a very informative document by Rowe, Mason, Van Dyk and Reinders (2006): "*Pilgrim's Rest. From mining village to World Heritage Site*" was given to the author. The objective of the document was a description of the development of the heritage assets at Pilgrim's Rest to secure World Heritage Listing, thus making the Central Reduction Works the first industrial site to be listed in Africa. In 1999 and again in 2002, experts from Germany visited the reduction works for a World Heritage Listing. In 1999, the museum received funding from the Westphalian Government, Germany, to erect an electric security fence around the Central Reduction Works and to purchase computer equipment. In 2003, funding was provided for the stabilising and securing of two severely deteriorating structures and architectural drawings and specifications of the museum visitors' path.

Rowe *et al.* (2006:21-23) summarise the potential value of Pilgrim's Rest and the surrounding area as a World Heritage Site, as follows:

- **Heritage status.** It will evaluate the town and surrounding area as a new level of heritage status. It will be the first Industrial Heritage Site in Africa, and this will bring added prestige and international recognition
- **UNESCO funding.** This is given to all world heritage sites and grants. The funding is often in the form of expertise and training in the professional and scientific fields of heritage conservation
- **Sustainable utilisation of resources.** This means that there must be a sound management plan available to ensure sustainability and development of the heritage site when World Heritage Listing is sought
- **Education and training.** The potential benefits are:
  - **Museum related:**

By providing guided tours to the public and school groups, information is communicated that increases public awareness of history and supplements the school syllabus. Specialised staff will be needed and they will need to be trained to perform duties of a professional nature within the museum field

➤ **Management and support staff:**

Staff will be needed to manage and perform operational and general maintenance duties. Of these, a number would undertake relatively specialised programmes, and, as such, will need specific training, such as that required for locomotive and technical staff

➤ **Construction:**

During the restoration and construction phase, there will be many opportunities to embark on training and transfer skill programs, specifically with regard to the building and construction industry

➤ **Tourism:**

In terms of tourism, World heritage listing ensures listed sites a prime position and as the opportunity to become a preferred destination. The income from tourism will benefit not only the town, but also the province as a whole. New opportunities will be created in terms of services and needed tourist accommodation in the area

➤ **Economy and job opportunities:**

An increase in tourism would greatly affect the economy of the area, which currently relies largely on tourism for income. At present, job opportunities are limited, with few or no immediate prospects for expansion. During the construction phase of the projects, a large number of temporary jobs will be created, together with a great deal of opportunity for unskilled workers to receive both income and training. In order to operate and manage a heritage site of this magnitude, and to make it available to the public, a considerable number of specialized, of skilled and of unskilled staff will be required within the public and related sectors. In order to deal with the increase in visitors to the area, businesses in Pilgrims Rest and surrounding areas will also need to employ more staff.

### 6.2.3 CASE STUDY 3 – KROMDRAAI VISITOR GOLD MINE - INTERVIEW RESULTS

A personal interview with a questionnaire was held with Gavin Whatley, the owner, on the 2<sup>nd</sup> October 2008 at the old Kromdraai Visitor Mine. The owner of the small visitor mine was the only person to be interviewed as visits to the existing, producing, gold mines are difficult to organise, except for geoscientists on special occasions.

#### 6.2.3.1 Background and history

The Kromdraai Visitor Gold Mine is situated in the serene Kromdraai on the farm “*Ibis Ridge*” about 60 minutes drive from Johannesburg International airport and 40 minutes from

Johannesburg city. The geographical location co-ordinates are 26°00, 211' South 27°46, 578' East.

Kromdraai is a very small mine. The old workings are entered through a large opening in the side of the hill. A short walk down the coco pan tracks through roughly worked tunnels leads into the heart of the mountain. The underground trip is a level and easy walk for all age-groups inside the mine tunnel. The conditions that people had to endure while extracting the gold ore can only be marvelled at. This is a wonderful outing, both for adults and children. The trip includes an exciting and informative tour of one hour with a lecture on the history, geology, ecology and culture of the mine. As the second gold mine of the Witwatersrand, Kromdraai can claim a prominent place in the history of the development of the gold fields of the Witwatersrand. In 1881, Johannes Stephanus Minaar whilst prospecting on the farm Kromdraai (with permission of owner J. H. Grobler) found a gold nugget that led to the discovery of the Kromdraai reef. This was 5 years before the main reef was discovered in Johannesburg. Kromdraai is part of the Black Reef Formation into which a 300 mm thick gold bearing hydrothermal quartz vein has intruded. In January 1882, the Potchefstroom Syndicate was formed, consisting of Minaar, T. Lisemore (another prospector) and five diggers. They applied for a license to prospect further.

The first government mining concession on the Witwatersrand was granted to Kromdraai Goldmine by the (then) President, Paul Kruger. By this time, it was well known that gold had been found on Kromdraai Farm, and many people were anxious that part of the farm be declared an open public digging. Anticipating a gold rush on his property, Grobler applied for a 'mynpacht' of 100 morgen to be granted to him and the rest to be declared as public diggings. On the 8 September 1885, a proclamation was signed by President Paul Kruger throwing open the rest of the farm to public diggings. Grobler effectively held the rights on most of the area known to be gold bearing and he could lease this to other diggers. Some of the unlicensed diggers worked with sluice boxes or panned for alluvial gold. There were a number of problems that faced the diggers, licensed or not, regarding such things as access to water for washing the gold, and generally, the feeling was that the whole farm should be opened to public diggings.

The prospectus of the "*Kromdraai Gold Mining Company*" appeared in the "*Volkstem*" in 1886, Capital: £30 000, Directors: Dow, Rimer, Cilliers, Bray and Nourse. The first gold was produced in March 1887 in the weight of 10lbs 11oz and 8dwts, obtained from 271 tons of quartz. This was a satisfactory result at a ratio of 25 grams of gold per ton. The ore was crushed by a stamp battery erected at the confluence of the Bloubank Spruit, the Sterkfontein Spring or 'race' and the head-waters of the Crocodile River.

As far as can be established, mining on the site ceased in about 1910, reopened for another year in 1913, closing finally in 1914. The mine was subsequently made safe by a large mining company and is regularly inspected

<http://www.showcaves.com/english/za/mines/Kromdraai.html>,  
<http://www.oldkromdraaigoldmine.co.za/>).

George Harrison discovered by chance, the main gold reef near Johannesburg in 1886. The first diggers moved in, and by September of that year, 3000 prospectors were working the area. The geologists Harry and Fred Struben were convinced of rich deposits, and erected a five-stamp battery on top of the area that became the largest gold-bearing reef in the world. By 1898, the gold production of the Witwatersrand was 118 tons. At that time, this exceeded the output of the entire United States of America.

### ❖ GEODIVERSITY, GEOLOGICAL SIGNIFICANCE

Unlike the main gold field of the Witwatersrand, the vein at Kromdraai is different in that it is not a conglomerate reef deposit. Shale and metamorphosed slate dip to the north in the mine. Virtually all of the main gold reefs of the Witwatersrand dip to the south in the Johannesburg area. The Kromdraai and Blaauwbank deposits are both hydrothermal vein deposits. In the Kromdraai mine the vein follows an irregular path where the main vein forced itself along a thin shale band, overlain by quartzite of the Black Reef Quartzite Formation. This was a natural plane of weakness. Thin offshoot veins that probably followed cracks in the rocks also occur. The chief mineral is white quartz at Kromdraai and Blaauwbank. Minerals are found, such as pyrite and arsenopyrite in the quartz at Kromdraai. The gold was about 20-25 grams per ton of quartz. There is still a little gold left in the mine. But the entire vein has been removed except in places where small pillars were left to support the roof. Even if it were to be removed, it would not be profitable to rework it now.



Figure 6.3: Examples of gold-bearing ores. Conglomerate (left) from a Witwatersrand Gold Mine and quartz vein (right), Old Kromdraai Visitor Mine

### ❖ GEOCONSERVATION

Since 1995, the present owner has conserved all the old workings in the mine, and it now forms part of the protected area of the Cradle of Humankind (COH). A holistic approach is therefore used to conserve the geoheritage, mining history, history and ecology.



## ❖ OTHER, SUPPLEMENTARY PRODUCTS

The Cradle of Humankind (COH) with all the solution caves, Sterkfontein, Maropeng, the Rhino Park and all the guest lodges are other tourism products that can be associated with the geoheritage site.

### 6.2.3.2 Present status

## ❖ RESOURCE ANALYSIS

It consists mainly of geoheritage, mining equipment and a small museum where a variety of old cooking and sewing utensils can be seen. The resource owner, his wife and a trained guide show people around the area.

## ❖ HOW SUSTAINABLE GEOTOURISM IS BEING IMPLEMENTED

A print out definition of sustainability was given to the respondent before the interview by e-mail and personally. During the interview, it again became clear that sustainability was a concept that was not well understood. The respondents did not give an answer to the question.

## ❖ SWOT ANALYSIS:

The personal interview using a questionnaire with Mr. Gavin Whatley proved very valuable and much information was obtained. The SWOT analysis (Strengths, Weaknesses, Opportunities and Threats) proved to be very informative also when obtaining an overview of key issues of the visitor mine. The owner also acts as a guide when the mine or museum is visited and he has, with great enthusiasm thoroughly researched its history.

### ▪ STRENGTHS

The strengths that were identified were:

- Authenticity
- Visitor mine experience *par excellence*
- Excellent interpretation and knowledge of gold mining by the guides;
- A good website exists
- The mine is unique because of the journey '*back in time*' that is taken;
- Good tarred roads reach the mine
- Strategic location adjacent to Sterkfontein and the Cradle of Humankind (COH); where
- Calcite mining at Sterkfontein led to the development of the gold mines at Kromdraai and the Witwatersrand. This also led to the discovery of the hominid remains at Sterkfontein.

- **WEAKNESSES**

The weaknesses that were identified were:

- There is a lack of capital for development
- There is a noticeable lack of educational visits by schools
- No coffee bar or restaurant is available
- The road signs to the visitor mine are poor
- Not enough marketing and awareness-creation has been undertaken
- The property is on private land and so is not supported by the COH.

- **OPPORTUNITIES**

The opportunities that were identified were:

- The larger mining companies could invest in the development of the mining complex to show the importance of South Africa's mining history
- The COH should be involved to help the landowner to develop the site
- A tea room and bed-and-breakfast facility could be built on the property
- Thought should be given to means of attracting more visitors
- A maintenance programme for the existing buildings needs to be developed
- An outlet for books, guides, pamphlets, videos, etc. needs to be provided.

- **THREATS**

The constraints that were identified were:

- There is a high level of crime in the region
- Cable theft is a significant problem for the mine
- The downturn of the economy poses a threat to the viability of the operation.

### 6.2.3.3 Lessons learned

Education is a necessity. Schoolchildren are fascinated by rocks, the mining equipment and the small museum. No policy or strategic geotourism development plan exists. The owner suggested making the whole farm a nature reserve to cater for all tourists with the emphasis on geotourism and ecotourism. There is no financial support from government, local municipalities and mining/financial companies. With increasing costs, it is necessary for the future of the visitor mine that they become involved. Because the visitor mine is not very well known, it is important that much more should be done in future to make people aware of it.

### 6.2.3.4 Implementation of sustainability

Educate people, particularly educators, about geology. A concise guide about the Kromdraai Visitor Mine, its development and history could be written and published. The COH, tour operators, school tour operators and normal tour operators, and the accommodation sector are stakeholders and should be encouraged to take up their responsibility. Currently, networking is done via the Internet and by word-of-mouth. The management of the mine is good. The

TV program, 50/50, should be contacted to arrange a visit to the mine to help market it. Sustainability was a new concept to the owner, and so was not implemented at all. However, the owner was willing to learn about at this aspect and to implement it.

#### 6.2.3.5 Benefits

More visitor artefacts will enhance the visitor experience. Geoproducts should be for sale, that is, models of small coco pans, lockets and enamel plates with Kromdraai printed on them. The interpretation facilities must be expanded. They should be professionally written and displayed to enhance understanding.

#### 6.2.3.6 Future actions

It was suggested to the owner that contact should be made with the COH UNESCO with the intention of creating a possible future geopark. This was seen as a good idea. It was emphasised to the researcher that fossils are preserved in the COH because of the geological control that takes place. TV campaigns, documentaries, magazine articles, pamphlets and books are necessary to increase awareness of the visitor mine. At the time of the visit, feedback on mine visits was received via the Internet and from a visitor book. This feedback should be encouraged.

#### 6.2.3.7 Additional information

There is also a gallery with paintings and framed pictures that adds interest to the mine museum.

### 6.2.4 CASE STUDY 4 – THE DIAMOND INDUSTRY KIMBERLEY - INTERVIEW RESULTS

A personal interview with a questionnaire was done with Mr. Ian Russell, General Manager of the Diamonds and Destiny Visitor Centre at the Big Hole in Kimberley, on the 22 September 2008. Thereafter, Dr. Leon Jacobson, a geologist at the McGregor Museum in Kimberley, was interviewed on 23 September 2008, and finally, Mrs. Victoria Ziegler, Manager Kimberley Microdiamond Laboratory (KMDL), De Beers, Kimberley, was interviewed on 24 September 2008.

#### 6.2.4.1 Background and history

The co-ordinates of Kimberley are: 28°44'18. 78'S, 24°45'17. 87'E. Kimberley is famous for its Big Hole, which is often referred to as the world's deepest man-made hole. (<http://www.showcaves.com/english/za/mines/Kimberley.html>)

The Big Hole itself is an astonishing sight. It was mined to a depth of 215 metres. It has a surface area of about 17 hectares with a perimeter of about 1.6 km. It is these statistics that support the claim to be the largest hand-dug excavation in the world. On 14 August 1914, work on the mine was suspended (<http://www.places.co.za/html/bighole.html>). In October 2004, De Beers announced a R50 million project, the Big Hole initiative. From the beginning, the company consulted with local stakeholders, the local and provincial government, tourism and business, to ensure that its plans were in line with those of the province and with the local municipality's urban renewal strategy. De Beer's overall intention was on providing business opportunities for Northern Cape's small-to-medium businesses and suppliers to develop their potential. The primary focus was the development of a world-class visitor's centre, the De Beers Diamond World, (this was to focus on De Beers, the Big Hole and Kimberley). The Big Hole tourism facility was handed over to a trust to manage it on behalf of the people of Kimberley. The board of trustees included representatives from De Beers and many stakeholders from the broader community (<http://www.debeersgroup.com/en/Exploration-and-mining/Mining-operations/Kimberley/>).

In 1867, Erasmus Jacobs, son of Daniel Jacobs, picked up a little, shining rock near Hopetown, and this led to the first diamond rush along the Vaal and Orange. On 16 July 1871, Essau Damoense discovered a whole handful of diamonds in the Colesberg Kopje that had formed a small hill. It was the erosional surface remains of a kimberlite pipe. This led to a diamond rush that made it impossible for the De Beers brothers to keep their farm. Digging commenced at the Kimberley mine site in in the same year. Originally, diamonds were mined in an open-cast mine, following the pipe. Colesberg Kopje disappeared and turned into a pit. Eventually, the result was the Big Hole; a vast crater that was dug entirely with picks and shovels. In this open-cast mine, 2,722 kg of diamonds were mined until its closure in 1914. Approximately 22.5 million tons of earth was removed.

*“De Beers Consolidated Mines was incorporated by Cecil Rhodes some 110 years ago it became the largest and most successful diamond company in the world, and so it has remained”* (Nicky Oppenheimer, Chairman of De Beers, 1999). The history of De Beers falls into three broad stages. In its first years, when the company produced over 90% of the world's diamonds, it was able to control the production, and hence the supply, of diamonds almost at will. From the beginning of the 20th century, when rival producers began to challenge its pre-eminence, De Beers used its still-dominant position to co-ordinate and regulate the supply of diamonds in pursuit of price stability and consumer confidence. In the closing years of the last century, the globalising economy rendered De Beers' role of industry 'custodian' both inappropriate and expensive. To respond to this, De Beers set about crafting a new strategy for the 21st Century by a suite of innovative programs and alliances designed to reinvigorate the industry and to grow demand for diamond jewellery.

De Beers' presence in Kimberley continues through the multi million rand Combined Treatment Plant processing the tailings resources, as well as the Big Hole project that is a

unique and exciting way for De Beers to invest in tourism activities, thereby supporting the communities that surround Kimberley Mines (<http://www.thebighole.co.za/>).

### ❖ **GEODIVERSITY, GEOLOGICAL SIGNIFICANCE**

Lynn, Wipplinger and Wilson (1998:232-258) reckon that South Africa is the only country in the world where diamonds are produced from kimberlite pipes, dykes (fissures), and blows, from eluvial (remaining close to the fissure), alluvial (transported away from the source) and from marine sediments. The west coasts of South Africa and Namibia have the only known, mega-placer deposits recognised on Earth. It is called a mega-placer deposit when it contains more than 50 million carats of diamonds, of which at least 95% must be of gem quality.

### ❖ **GEOCONSERVATION**

Little has been done so far for the geoconservation of old diamond mines and workings except for the Big Hole at Kimberley, and the Cullinan Mine. Unfortunately, there is no consolidated effort in Kimberley. Individual establishments such as the McGregor Museum did much for archaeological conservation. Dr. Jock Robey, a very experienced kimberlite geologist, gave excellent geological input into the exhibitions at the Big Hole when he was working for De Beers.

### ❖ **OTHER, SUPPLEMENTARY TOURISM PRODUCTS**

Other supplementary products in Kimberley and surrounding area are:

- The Digger's Fountain, in the Ernest Oppenheimer Memorial Garden, portrays five diggers holding a diamond sieve on high, each digger representing one of the five major Kimberley mines
- The McGregor museum is well-known for its archaeological exhibits
- The Ghost Trail is a night-time historical tour of the city utilising reports of ghost activities and sightings
- The battlefields of the Anglo-Boer War (1899-1902) in and around Kimberley are:
  - Honoured Dead Memorial (Kimberley)
  - Cape Corps Memorial, World War II Cenotaph (Kimberley)
  - Blockhouse at Modder River
  - Highland Brigade Memorial at Magersfontein.
- On the northwest outskirts of the town lies Kamfers Dam; this supports the largest permanent population of Lesser Flamingos in Southern Africa. Man-made nest were made during 2007 to help with breeding of these birds. This was a very successful operation
- Other places to visit are Canteen Kopje 35 kilometres from Kimberley, Barclay west, where the first diamond was found. In this pit, the early diggers removed 4m of Hutton sands to get to the underlying diamond-bearing younger gravels. This layer

was mined further by means of small horizontal tunnels that are sometimes over 10m long

- On the farm Nooitgedacht, a glacial pavement that was formed 250 million years ago, can be seen

(<http://www.sa-venues.com/regions/default.htm>).

#### 6.2.4.2 Present status

### ❖ RESOURCE ANALYSIS

The Big Hole is a new Diamond Theme Park located at the rim of the hole and is owned by De Beers. It was developed from the former Kimberley Mine Museum when in 2006 De Beers invested R50 million for the renovation and extension of the site. The new Diamonds and Destiny Visitor Centre at the Big Hole in Kimberley was completed in 2006. It was opened to the travel industry, the local and international media, and leading tour operators on 23 November 2006. It attracts about 100 000 visitors per year. The tourist attraction caters for all visitors. It is an excellent example of a visitor centre. The existing Open Mine Museum is divided into two sections. *Diamond Rush* is a unique leisure area for visitors in an *Old World Kimberley* setting developed from existing buildings and the prevailing surroundings. In the old town, period buildings that have been preserved or restored to their original glory can be discovered; these include a church built in Europe and shipped to Kimberley, Barney Barnato's Boxing Academy, the digger's sleeping quarters and the De Beers Private Railway coach that was used by Cecil John Rhodes to commute between Cape Town and Kimberley. This old town brings life to the New Rush era of life where desperate, but hopeful and determined people flocked to the town of Kimberley to seek their fortune.

The *De Beers Diamond World* is dedicated to the history of diamonds. It focuses firstly on the history and impact of diamonds on the history of the South Africa and secondly, on the impacts of labour and where it comes from. In a state-of-the-art, 65-seat theatre, a short film introduces visitors to the story of diamonds at Kimberley. It takes audiences back to early 1867, when children picked up a shiny stone on the banks of the Orange River.

The Real Diamond Display is housed in a vault that was specially constructed for the Big Hole Facility. The exhibition at the Diamond vault in the Pulsator Shed houses over 3 500 real diamonds. Among the gems on display is the 616, named for its carat size, which is the largest, uncut, octahedron diamond in the world. Appropriately, the Eureka, the first diamond discovered in South Africa in 1866, is also on show. It was over 21.10 carats uncut and is now 10.73 carats cut.

The most spectacular addition of the recent renovation is a cantilevered platform above the rim of the Big Hole that was completed for the November 2006 opening. The Platform is 30 by 30 Cape feet, which was exactly the size of a 19th-Century mining claim. It allows the visitors a vertical view down into the hole, as it protrudes across the western rim like a half

suspension bridge. However, although it is 90m long, it does not protrude over the central pit with the lake. In time though, with the natural break-back of the hole, the platform will eventually be positioned further towards the centre of the hole (<http://www.thebighole.co.za/>). A mineshaft was recreated next to the viewing platform. Here, visitors can experience the perilous 19<sup>th</sup> century mining conditions.



Figures 6.4: Plan of the Diamonds and Destiny Visitor Centre, Kimberley

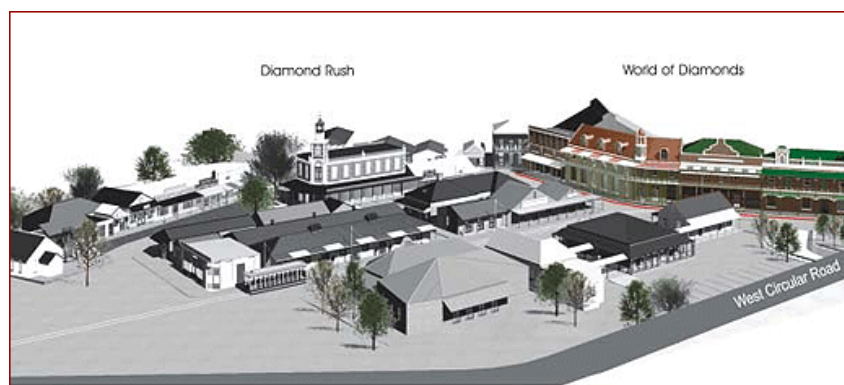


Figure 6.5: Diamonds and Destiny Visitor Centre, Kimberley.  
(<http://www.thebighole.co.za/sitemap.html>)

Equipment used to process the diamond ore is housed in the Pulsator Building. Visitors can see jiggling machines and grease tables specially designed to extract diamonds from the ore. Although mining and extracting techniques have improved vastly, modern mining still uses

the same basic methods that were developed in Kimberley. For an interactive experience visitors can also try their hand at sorting and selecting diamonds.

De Beers had a large division of well-trained geologists in South Africa, but as the Koffiefontein Mine, Kimberley Mines and Cullinan Mine have been sold to Petra Diamonds, fewer geologists are now based in Kimberley. De Beers is focused on developing local talent in the countries in which it is actively exploring, such as Angola. There are also a number of geologists working for smaller companies such as African Diamonds, Tawana Resources and BRC Diamondcore.

### ❖ **HOW SUSTAINABLE GEOTOURISM IS BEING IMPLEMENTED**

A print out definition of sustainability was given to every respondent before the interview, either by e-mail or personally. During the interviews, it became clear that sustainability was a concept that was not well understood. One respondent (Ziegler) gave a response to the question, but the others did not.

### ❖ **SWOT ANALYSIS:**

During the personal interviews with a questionnaire with Mr. Ian Russell, Dr. Leon Jacobson, and Mrs. Victoria Ziegler, much valuable information was obtained. The SWOT-analysis (Strengths, Weaknesses, Opportunities and Threats) proved to be very informative when forming an overview of the key issues in the diamond industry of Kimberley. Every person gave their answers on specific matters in their specific domain. Thus, their responses were grouped together and were then integrated in the results that follow.

#### ▪ **STRENGTHS**

The strengths that were identified are:

- The site is a world leader in diamond mining and beneficiation
- Many overseas tourists visit the well-known diamond destinations such as Kimberley and Cullinan
- The Big Hole is world famous and a world class destination
- The Diamonds and Destiny Visitor Centre at the Big Hole is a world-class visitor centre
- The Big Hole is not only unique, but is the biggest tourism attraction in Kimberley
- The impact of diamonds on history is a significant draw
- The contribution by various stakeholders.

#### ▪ **WEAKNESSES**

The weaknesses that were identified were:

- The historical reliance on De Beers
- The location – few overseas tourists are attracted unless they specifically wish



to come to Kimberley; there is no “passing trade”

- There are insufficient, other tourism attractions
- There is a lack of public interest in geology (for instance, geology is not incorporated in the school curriculum)
- There is no written guide to the Big Hole
- There is no government support for the site
- No education centre at the site.

#### ▪ **OPPORTUNITIES**

The opportunities that were identified were:

- The possibility of integrating the geotourism product into a greater regional, provincial, and even a countrywide, strategy
- The development of geotourism
- Greater educational development and enhancement
- Possible incorporation into a UNESCO World geopark
- The development of other, complimentary, tourism attractions
- The compilation of a book for laymen on diamond geology
- The education of the layman on diamond geology
- The establishment of independent cutting and polishing facilities in Kimberley
- The publishing of visitors’ brochures and routes
- The writing and publishing of a new book on the diamond industry of South Africa.

#### ▪ **THREATS**

The constraints that were identified were:

- A declining diamond mining industry
- Intervention by the government as sole mineral rights holder
- The standard of teaching is very poor in schools, particularly the subjects of mathematics and science, and so fewer children are available and trained for technical jobs
- There is no geology curriculum at school
- Geology is not marketed as a ‘sparkling career’
- The downturn in the economy.

#### ❖ **LACK OF INTEREST IN GEOLOGY**

One of the respondents (Ziegler) remarked that there is also a lack of interest in either mathematics or science. This must be addressed if non-professionals are to be educated in these subjects.

#### 6.2.4.3 Lessons learned

No strategic management plan for geosites exists except for that of the Big Hole. The

planning, management and marketing was exceptional for the new Visitor's Centre. Kimberley is a new emerging business centre and to promote this, local construction teams were used. South African Airways (SAA) is the only airline that serves the town – flights to the town are very expensive with a single ticket from Johannesburg costing about R2 400! Financial support for the development from came from local municipalities and mining and financial companies. Support from the government is less tangible, being only verbal. It is believed that SAHRA should be restructured to mandate the fulfilment of their mission to preserve natural and cultural heritage. New legislation is required to encourage the preservation and conservation of South Africa's natural heritage.

#### 6.2.4.4 Implementation of sustainability

During the interviews, it became clear that sustainability was a concept that was generally not well understood. However, De Beers is an exception. One of the respondents (Ziegler) pointed out that De Beers is focused on sustainability and measures itself against Best Practice Principles. The De Beers Annual Report to Stakeholders highlights progress made by the company in terms of sustainability, and the report is divided into sections under the headings of:

- Economics
- Ethics
- Employee
- Community
- Environment.

It must be pointed out that this is from the De Beer's company point of view. The De Beers Family of Companies is committed to sustainable development as an integral part of the way the companies do business. Addressing sustainability issues means enhancing their relationship with host and partner governments, building consumer confidence in diamonds, and ensuring their activities contribute positively to the livelihoods of both present and future generations. The development of a powerful business model is based on the convergence of two compatible aims:

1. The company's need for long-term access to natural resources in a secure and stable environment, and
2. A government's need to generate reliable revenues from natural resources to invest in its people.

This model is particularly important in diamond mining, given the long lead times before investment in a mine returns a profit, and given the fact that the life of a diamond mine is typically measured in decades rather than years.

(<http://www.debeersgroup.com/en/Sustainability/>,

[http://www.debeersgroup.com/ImageVault/Images/id\\_1041/ImageVaultHandler.aspx](http://www.debeersgroup.com/ImageVault/Images/id_1041/ImageVaultHandler.aspx))

When overseas research and experience in geotourism development is applied, the following points become important:

- Main objective must be to acquire better awareness and knowledge
- The generation of a sustainable geotourism strategy
- Sustainable geotourism development.

A geopark should be established for the Kimberley area, including Barclay West. The main objectives should be:

- To engender better awareness and knowledge of geotourism
- To enable good planning
- To promote sustainable geotourism development
- Plan implementation
- Constant evaluation and review.

A starting point for the sustainable development of geotourism in the diamond industry would be to educate tourists more about the environment, particularly about geology, geodiversity, geoheritage, the interpretation of geology and the geological processes.

#### ❖ **STAKEHOLDER INVOLVEMENT**

In Kimberley and Cullinan, there are many stakeholders who work closely together. They represent De Beers, Northern Cape tourism, Provincial Government, local and district municipalities, accommodation suppliers, museums, art galleries and the private sector. The Big Hole project increased the number of visitors to Kimberley and so is of socio-economic benefit not only to the Kimberley community, but to the Northern Cape as a whole. Battlefields, museums and nature reserves sectors can all work together for mutual benefit in the tourism sector.

For example, during a visit to Kimberley, a tour to view the cutting and polishing of diamond can be arranged. The tourist will be told that the four most popular factors used to measure diamond quality are cut, carat, colour and clarity (4Cs). These criteria were introduced by De Beers to consumers in 1939 in order to provide consumers with a reference for evaluating diamonds. It is noteworthy that colour, clarity and carat are created naturally as the diamonds are formed in the earth, while cut is directly influenced by the human hand.

High quality diamonds are mostly used as jewellery while industrial diamonds are mainly used for cutting, grinding and drilling. The jewellery manufacturing industry is producing distinctive gold, platinum and diamond of a quality and design that confirms the country's position as the land of gold and diamonds for although the 4Cs provide scientific guidelines for evaluating diamond quality, they do not necessarily measure diamond beauty. It is this perceived beauty that encourages the purchase of jewellery, of gold and of diamonds.

Networking is encouraged with the tourism and with private business sector. De Beers still retains management control of the Big Hole.

#### ❖ **MARKETING**

All diamonds from De Beers' South Africa mines are sorted after they arrived into around 12 000 categories and valued at Harry Oppenheimer House in Kimberley. Not all diamonds can be cut and polished profitably at one centre. Labour, technical expertise and specialisation all contribute to the manufacturing costs. About half of South Africa's production, in value terms, is cut in the country. In order to stimulate the demand for diamond jewellery, De Beers conducts international marketing campaigns in 24 countries. De Beers began diamond advertising in 1939 and today, the slogan '*A diamond is forever*' is internationally known. (<http://www.debeersgroup.com/en/Sales-and-distribution/Sorting-and-valuing/>).

Even more promotion should be done with lectures, slide shows, audio-visual presentations and printed brochures by all the stakeholders in the diamond industry in Kimberley. Articles should be written intended for publication by magazines and TV programs should be made.

#### 6.2.4.5 Benefits

#### ❖ **CONSERVING NATURAL HERITAGE**

The Big Hole project is an excellent example of how the natural heritage can be conserved. De Beers has also established the Diamond Route. The Diamond Route is a partnership between De Beers, E. Oppenheimer and Son and AGRED (African Gamebird Research, Education and Development Trust). The initiative serves as a collective brand for bird conservation areas dedicated to biodiversity protection and to ecotourism. As part of the project, nine De Beers and Oppenheimer properties have been opened to the public. These include about 250 000 hectares of ecologically rich and diverse protected areas, situated in Gauteng, Northern Cape and Limpopo Province.

#### ❖ **ENHANCING THE VISITOR EXPERIENCE**

To enhance the Kimberley visitor's experience, the Diamonds and Destiny Visitor Centre is divided into two sections. Audiovisual effects simulate the underground experience, while a spectacular, upgraded, rough diamond display, a viewing platform and interactive audiovisual displays enhance the visitor's experience. The diamond and jewellery store, coffee and curio shops complement a unique visit to the museum. When Kimberley was visited during the research project, the tram, and an example of historical mass-transportation, was not running but was in the process of being repaired prior to being returned to service. Gold and platinum deposits and mining and, lately, the cutting, polishing and diamond jewellery industry are closely associated with the diamond industry and so, complement it. Tours to existing small alluvial working mines could be arranged to enhance the touristic product.

## ❖ GEO-EDUCATION

The nearby Bultfontein Mine offers the world's only guided tour of an operational diamond mine. Wearing a real miner's gear - an overall with light reflecting strips, safety boots, hard hat, battery cell with headlamp and an individual "*Osizamoya*" which is an oxygen generating survival pack, visitors are given a taste of the diamond mining experience. A plunge of 840 meters explores the source of those much wanted, glittering diamonds. Rubbing shoulders with real mineworkers, the visitor becomes one with the rhythm and pulse of the world's oldest diamond mines, tastes dust from ancient kimberlite rock and knows that this is the educational experience of a lifetime. It is not yet known if the tours, currently offered under the auspices of De Beers, are going to continue because another mining company, Petra, is buying the mines.

## ❖ INTERPRETATION

The diamond pipeline of de Beers describes the journey of diamonds, during:

- Prospecting and exploration
- Mining and recovery
- Sorting and valuation
- Cutting and polishing
- Jewellery and manufacturing; and finally
- Marketing of the diamonds themselves.

(<http://www.debeersgroup.com/debeersweb/Diamond+Industry/The+Four+cs/>,  
[www.debeersgroup.com/.../Economics/Case+study+-+Kimberley+Big+Hole+tourism+project.htm](http://www.debeersgroup.com/.../Economics/Case+study+-+Kimberley+Big+Hole+tourism+project.htm),  
[www.debeersgroup.com/.../Diamond+Journey/De+Beers+Global+Operations/Projects/Kimberley+Big+Hole+Project.htm](http://www.debeersgroup.com/.../Diamond+Journey/De+Beers+Global+Operations/Projects/Kimberley+Big+Hole+Project.htm)).

### 6.2.4.6 Future actions

The local municipality both assists and encourages new businesses in Kimberley. There are big developments and growth in the town. It is believed that the Diamond and Destiny Big Hole tourist attraction will draw tourists from all over the world to the Northern Cape. The Big Hole and its associated attractions have the potential to become a dynamic World Heritage Site of unique and lasting value, forming part of a holistic initiative involving a range of interest groups. It is an asset, which in time could form the hub of a wheel of tourism initiatives branching out all over the Northern Cape. The interpretation facilities can be upgraded at the Big Hole. By attending overseas congresses, benchmarks can be found that will enable compliance with international standards

(<http://www.thebighole.co.za/Background.htm>).

## ❖ AWARENESS CAMPAIGNS

Much has been done already, but much more remains to be done. However, there is a constraint in that there is a lack of funding. De Beers has already spent a great deal of time and money in awareness campaigns through scholarships, scholar vacation projects, etc. One of these campaigns included contracting a local Kimberley artist, Mrs Maggie Newman to paint a series of beautiful paintings depicting the formation of diamonds, kimberlitic volcanic craters and alluvial diamond processes. These paintings were made into a series of posters called “*The Diamond Story*” and they were donated to all schools in the Kimberley region and the basics of diamond geology were explained to the students. De Beers has also organised an annual Career Day coinciding with the “*Take a Girl Child to Work*” initiative. Pupils interested in geology have been given tours of the mines and diamond sorting areas and informed about potential careers in geology. Unfortunately, there is no geology component in the school curriculum. It would be helpful to create a 4x4 trail to encourage the nonprofessional’s awareness of geology and the part it plays in work and leisure alike.

### 6.2.5 CASE STUDY 5 - CRADLE OF HUMANKIND (COH) - INTERVIEW RESULTS

Because neither the manager nor marketing manager was available, a personal interview with a questionnaire was completed with Me. Lindsay Marshall, a palaeo-anthropologist and the curator of Maropeng in the COH, on the 18 September 2008 at Maropeng. Afterwards the Sterkfontein Visitor Centre was visited to make notes and to take photographs.

#### 6.2.5.1 Background and history

The Cradle of Humankind (COH) World Heritage Site (WHS) lies mainly in the Gauteng Province, with a small extension into the neighbouring North-West province, and covers 47 000 hectares of mostly privately owned land, to the north-west of Johannesburg. Its four corners are roughly the towns of Lanseria, Oaktree, Hekpoort and Broederstroom. There are two visitor centres:

1. Sterkfontein: S 26° 1,049' E 27° 43,763'
2. Maropeng: S 25° 58,746' E 27° 39,871'

The fossil-bearing caves of the Sterkfontein Valley, near Krugersdorp, are part of the COH WHS. It is the most prolific and accessible fossil hominid site on earth, and about 40% of the world’s hominid fossils have been found here. This is where the first adult ape man (*Australopithecus africanus*) and the famous “*Mrs Ples*” were discovered, as well as the first complete *Australopithecus* skeleton. Wonder Cave has fantastic stalagmites and stalactites and has been opened to the public

(<http://www.southafrica.net/index.cfm?sitepageID=14225&CountryProfileID=3>).

A schoolboy discovered a skull at Sterkfontein in 1947. It was subsequently described by Dr. Robert Broom as “Mrs Ples” (*Australopithecus africanus*); a 2.5-million-year-old australopithecine skull which provided proof that *Australopithecus* could be classified as a member of the Hominidae (the family of humans). This established Africa as the Cradle of Humankind. In 2005, Taung (Northern Cape) and Makapan’s Cave (Limpopo) were added to the COH. “Little Foot” is an almost complete australopithecine skeleton that is around 4.17 million years old. These fossils, both found in the Sterkfontein Caves in the COH, offer much information about how, and under what circumstances, modern humans, *Homo sapiens*, evolved. Archaeological finds within the COH also include 2-million-year-old stone tools. These are among the oldest tools recorded. At Swartkrans, a collection of about 270 burnt bones tells an important story of a momentous early technological innovation – the ability of the earliest peoples to control fire - more than a million years ago.



Figure 6.6: Map of the Cradle of Humankind (COH) (<javascript:openwindow'fossilfindsmap.html',430,570>)

### ❖ GEODIVERSITY, GEOLOGICAL SIGNIFICANCE

The COH site comprises a strip of a dozen dolomitic limestone caves containing the fossilised remains of ancient forms of animals, plants and, most importantly, hominids (that is, members of the human family). Continued erosion on the earth's surface, and dissolution of the dolomite, eventually resulted in shafts forming from the surface of the earth to the caverns below. Bones, stones and plants washed down these shafts into the caves. Animals and hominids fell into the caves, were trapped and died. The bone and plant remains became fossilised and, along with various stones and pebbles, became cemented in a hard mixture called breccia. Embedded in the dolomitic rocks is a rich variety of well-preserved fossilised remains of early pre-humans (hominids), their stone tools, as well as a wide variety of fossils

of plants, animals and pollen. Here can be found the clues to the demography, variability, behaviour, growth and development of early hominids.

The Cradle of Humankind was inscribed on the World Heritage List on 2 December 1999.

### ❖ GEOCONSERVATION

In 1997, the South African government signed the 1972 UNESCO Convention on the protection, preservation and promotion of the world's natural and cultural heritage so making South Africa eligible to nominate sites of unique international significance. The palaeontology and palaeo-anthropological sites are thus preserved, so that all forms of activities that could lead to the destruction of these sites and their values is avoided and prevented. However, the COH WHS also represents an important opportunity to promote both the site's outstanding universal values, together with the World Heritage Convention. To achieve these objectives, it requires that the site is developed and managed sustainably, and economic and social development is promoted. By enshrining the protection and conservation of the palaeontology, archaeology and the natural resource base, the COH WHS may be developed further to the benefit of communities and the country.

(<http://www.cradleofhumankind.co.za/docs/chapter1-10.htm>).

### ❖ OTHER, SUPPLEMENTARY TOURISM PRODUCTS

The COH site offers a unique natural, cultural and historical tourism experience. Some of the activities already available include:

- Cave tours to learn about the evolution of humankind
- Game drives
- Mountain bike trails
- Overnight hiking-trails
- Craft rambles
- Adventure activities.

#### 6.2.5.2 Present status

The difference between Maropeng and Sterkfontein Caves is that Sterkfontein Caves consists of a scientific exhibition, a walk through time up to the entrance of the caves, and a tour of the caves. When the caves are exited, there is either a short walk back to the exhibition or a walk along the boardwalks to see where "Mrs Ples" was found. It is an excellent visitor centre.

The storyline of the display begins with the formation of the Earth and ends with an original fossil display:



1. **In the lobby:** Here the visitor can take in the architecture and décor. Attention must be drawn to the manner on which the classical elements – earth, fire, water and air – are reflected in the various aspects of the building. These elements are important in the formation of the planet and they will be experienced more throughout the exhibition.
2. **Descending the ramp and boat ride:** A time-line highlights some of the major events in the Earth's history. The boat ride adventure retraces the various stages in the creation of the Earth through snow, ice, water, and the origin, when it was a ball of molten rock.
3. **The birth of the Cradle:** Here, an audio-visual presentation shows how the earth and its continents were formed millions of years ago. This is followed by an interactive zone where cave formation and evolution as science are introduced.
4. **The path to humanity:** Human evolution is explored through audio-visual displays, graphic panels and life-like recreations of species based on the original fossils and environment. “*The Path to Humanity*” explores human evolution, while models of five hominid types on display: the *Homo floresiensis*, *Homo habilis* and *Homo heidelbergensis* species and the *Australopithecus* and *Paranthropus* genera.
5. **What it means to be human:** The nine characteristics that make humans human are explored, offering links to the modern world and demonstrating the gradual build up of human and environmental interaction over time. ‘Sustainability’ examines how humanity has modified the environment to suit them, and the danger currently faced, of actively contributing to mankind’s own destruction.
6. **Original fossil display:** Original fossils on loan from scientific and educational institutions are periodically on display.



Figure 6.7: View from north of The Tumulus Building Exhibition Centre, Cradle of Humankind (COH)

Maropeng’s main attractions include:

- Visitors’ centre
- Conference facilities for up to 350 delegates

- Three restaurants
- Luxury boutique hotel with views over a private game farm
- Outdoor 5 000-seat events amphitheatre
- Accommodation for 120 schoolchildren
- Retail food outlets
- Destination retail store
- Visitor information points
- Arts and crafts marketplace
- Observation deck, and
- Ample parking for cars and coaches.

#### ❖ **RESOURCE ANALYSES**

The R347-million Cradle of Humankind development is an initiative by Blue IQ and the

Gauteng government, and was the first public-private partnership (PPP) of its kind in South Africa. Maropeng a’Afrika Leisure (Pty) Ltd (MAL) manages Maropeng. MAL is the concessionaire in a Public Private Partnership with the Gauteng Provincial Government and the University of the Witwatersrand (WITS). MAL has the responsibility for the design, construction, exhibition installation, operation and maintenance of the Interpretation Centre Complex for the COH WHS. The aim is to develop and manage the world heritage site as a premier tourist destination.

WITS owns the Sterkfontein Caves and it is the major excavator of the Cradle site, while Standard Bank donated 100 hectares of land for Maropeng ([www.maropeng.co.za](http://www.maropeng.co.za)). As previously noted, the COH is the richest hominid fossil site in the world, leading to the primary resources being paleo-anthropological and archaeological resources.

According to the respondent to the questionnaire administered, sustainability is covered in the displays at Maropeng. The COH as a tourist destination applies the sustainability principles of Heritage South Africa who have set the standards. It is known for example, that mining water from the gold mines to the south has an impact on the cave ecology. Environmental indicators are monitored by zoologists. To minimise any environmental effect, Sterkfontein has placed limits on visitor numbers.

#### ❖ **HOW SUSTAINABLE GEOTOURISM IS BEING IMPLEMENTED**

A printed definition of sustainability was given to the respondent before the interview by e-mail and personally. During the interview, it became clear that sustainability was a concept that was not well understood. The respondent did not give an answer to this question.

#### ❖ **SWOT ANALYSIS:**

During the personal interviews, using a questionnaire, with Me. Lindsay Marshall much

valuable information was obtained. The SWOT analysis (Strengths, Weaknesses, Opportunities and Threats) proved to be very informative when forming an overview of key issues of the COH. Her response was representative of the manager and marketing manager (both were not available at the time). This response was integrated with Internet results and is shown in the results below.

#### ▪ **STRENGTHS**

The strengths that were identified were:

- The World Heritage Site Listing was done with specific focus on its global importance and value in understanding the evolution of human history:
  - Government commitment and support exists for the initiative
  - Local enthusiasm and support for the concept exists
  - Support is available from scientific community.
- The site is in close proximity to the large Gauteng market (both international and national visitors); it is very accessible given its close proximity to infrastructure and urban settlement
- There is a relatively stable, ecosystem structure and function although some modification has occurred
- Integrated development approach at a local level has been undertaken
- The area is small enough to plan comprehensively and manage intensively
- Near-natural environment in parts give a strong sense of place - representative of near-natural transition zone between grassland and savannah biomes
- There is a high species richness especially large ungulate mammals
- Many key landowners are not economically dependent on income earned from farming
- There are conference facilities, an excellent website and a hotel available at Maropeng, while
- Maropeng and Sterkfontein Caves have excellent visitor centres.

#### ▪ **WEAKNESSES**

The weaknesses that were identified were:

- The land ownership is multiple, fragmented and private
- There is a risk of decline in landowner support and commitment
- There is inadequate institutional capacity to manage and regulate
- There are no obvious biophysical boundaries to the area
- There is a potential for infringement on landowner rights
- The possibility of enriching 'haves' and bypassing 'have-nots' is an ever-present risk
- The spatial pattern of current land use poses limitations on the rational zonation and for future development planning
- There is a risk of viewing the area in isolation of its broader regional and provincial contexts, and not taking externalities into account
- The distance from the major markets of Pretoria and Johannesburg

- Limitations of the boutique hotel at Maropeng - for big conferences, it is too small, and has not enough beds available; therefore Magaliesburg has to be used to deal with this.

## ▪ **OPPORTUNITIES**

The opportunities that were identified were:

- The integration of geotourism into the palaeontology and palaeo-anthropological experience
- Potential to develop a vision that all stakeholders can support
- Potential for further appropriate development with many assets and attractions as a basis
- The possibility of attracting international funding for development of the area;
- Sustainable development with holistic, integrated planning and management
- The possibility of enhancing security of tenure, peace and harmony in the area
- Potential for socio-economic development, job creation and training
- Strengthening of community structures and community representative institutions
- Potential to demonstrate the benefits of implementing good environmental management and development policies arising from biodiversity conservation
- The development of incentives for Best Environmental Practice and Codes of Conduct
- The diversification of economic activity in the area
- Promoting small, medium and micro-sized enterprises (up to 200 employees) (SMME) development
- Community empowerment
- Creation of a vision owned by all for a shared benefit
- Educational development and enhancement
- Community based resource management
- Non Governmental Organisation (NGO) involvement and support
- The demonstration of a “Green” housing project in line with “eco-village” or the on-farm environmental housing concept;
- The creation of a model for an environmentally-aware and proactive way of life for communities
- Cultural development and enhancement
- The possibility to become the premier visitor destination in South Africa.

## ▪ **THREATS**

The constraints and threats that were identified were:

- The land use management objectives of private land owners and those of DACEL differ
- The fragmented land ownership and diversity of stakeholder/IAP interests
- Natural disasters, such as fire, flood, drought and seismic activity
- Opportunistic behaviour or development not in keeping with the vision and

objectives of WHS

- Destruction and degradation of the resource base
- The COH WHS is affected by negative impacts of activities outside its boundaries such as peat mining, upstream water abstraction, dewatering of gold mines and contamination - all of which affect water quality - and the water table level which poses a threat to the stability of dolomite areas
- An influx of people into the COH WHS in search of benefits and employment
- Tensions between stakeholders
- Unrealistic expectations
- Government-imposed, short time frames
- Inappropriate development occurring
- Unknown, long term, financial implications for Government (a “*leap of faith approach*”) that may not be met in the future
- Dwindling support if expectations not met
- Crime
- Low population base rendering expensive the provision of services
- Destruction or loss of heritage values (cultural and natural) through uncontrolled access to the caves and other non-declared fossil sites
- Incorrect or poor media and publicity
- Deterioration in employer and employee relationships (for example. farmers ploughing up graves, wages, grievances, etc.)
- A general lack of guidelines for the development of subterranean systems and new dig sites
- A lack of codes of conduct for tour operators, businesses and visitors
- A lack of a code of conduct for palaeo-anthropologists within the subterranean system
- The downturn in the economy.

#### 6.6.2.3 Lessons learned

During the interview, it was established that geology was mostly ignored and under-emphasised because the palaeo-anthropological view of the COH was the dominant theme. The role of geology was also not well understood.

#### ❖ STRATEGIC GEOTOURISM DEVELOPMENT PLAN

The aim of the “*Tourism Analysis Report*” was to provide guidance for the development of the COH as a prime tourist destination in Gauteng. In the case of the COH, a very systematic preparatory planning phase was done before mid-1999. In this phase, a number of specialist studies were conducted including archaeology, palaeo-anthropology, geology, hydrology, ecology, land use and infrastructure, state of the environment, tourism and marketing, stakeholder participation, and financial plans. A comprehensive “*Integrated Environment and Conservation Management Plan*” followed later in 1999. This plan articulated a clear

justification for World Heritage Listing. The master planning and implementation of planning was done prior to the application of World Heritage inscription in 1999.

From August 2000 to August 2001, master planning was done to re-confirm the previous planning work, to provide further confirmation and research, and to develop the strategic and implementation plans. The master plans were consolidated into a single report (*“Integrated Report for the Development and Management of the Cradle of Humankind World Heritage Site”* (IECMP)) including:

- Environment and conservation reports
- Land use and infrastructure master plan
- Tourism analysis and spatial plan
- Interpretation network master plan
- Policy document and manual for tenure security and housing development
- Socio-economic study and community benefits plan
- Financial and business plan, and
- Economic impact report

(<http://www.cradleofhumankind.co.za/docs/chapter1-10.htm>).

The implementation phase began in September 2001 when DACEL published a call in South Africa, the USA and the UK for Expressions of Interest in the design, construction, development and operation of an Interpretation Centre Complex for the Cradle of Humankind World Heritage Site.

Overall, the integrated planning for the COH WHS took four years. The Master Plans that followed from this process laid a solid foundation for implementing development. There was financial support for the COH from the government and private stakeholders. Although the Tourism Analysis Report was intended for tourism only it could also be applied in the case of geotourism.

#### 6.2.5.4 Implementation of sustainability

##### ❖ **APPLY OVERSEAS RESEARCH/EXPERIENCE IN GEOTOURISM DEVELOPMENT**

Overseas research and experience was undertaken in the planning and development stages of the COH by outside experts and consulting agencies. It is important to ensure that all decisions and proposals be made within a broad biophysical and socio-economic context with the explicit objective of ensuring environmental sustainability. To incorporate environmental sustainability issues into different work streams, all technical teams were required to consider sustainability issues in all phases of their work. Suggested sustainability objectives for the COH include:

- Meeting both present and future needs

- Maintaining the productive capacity of natural resources and systems
- Maintaining a balance between human needs and the needs of the ecosystem to maintain the productive capacity. (This acknowledges that there are limits and requirements for balance).

Geological displays should be set up at the old Holcim quarry west of Sterkfontein, Sterkfontein Caves and Maropeng.

The COH “*Tourism Analysis Report*” gave guidance for the development of the COH as a prime tourist destination in Gauteng. To achieve this aim, the objectives that were set included defining the potential visitor volumes to the COH WHS, matching the envisaged demand with appropriate infrastructure, and identifying strategies to enhance the tourist offering in the COH WHS. However, this was not done completely and needs much further investigation and research. The objectives of this master plan included:

- Identifying a variety of facilities for visitor recreation that focus on the inherent tourism assets of the COH WHS with a minimum impact on the natural and cultural environment
- Identifying opportunities that will enhance visitor access and interpretation of the COH WHS
- Identifying opportunities for a diversity of visitor experiences related to the inherent tourism assets of the COH WHS that will have an international and national competitive advantage
- Promoting a consistently high standard of tourism services and facilities that will contribute to the COH WHS’s competitive advantage
- Identifying direct opportunities for local community involvement and entrepreneurship
- Promoting socially responsible access to the COH WHS for all South Africans.

#### ❖ SUSTAINABLE GEOTOURISM STRATEGY

In the sustainable geotourism strategy, the management of the fossil sites should be the highest priority and the starting point for development. The fossil-bearing cave deposits are considered to be of outstanding universal value because they encapsulate a superbly preserved record of changes in the faunal population of the area, as well as an invaluable record of the stages in the emergence and evolution of humanity over the past 3.5 million years. These sites represent a primary resource for interpretation. They should be carefully managed and protected in partnership with the landowners.

The management objectives for the paleontological sites, outlined in the DACEL document: “*Cradle of Humankind, Towards a Management Plan*”, are:

- To promote access to some of the palaeo-anthropological sites that are easily accessible and to provide information about the scientific significance of these sites to

the general public

- To prevent unauthorised access to sites and to provide adequate protection;
- To promote and co-ordinate research efforts
- To establish the risks associated with the increased use of the palaeo-anthropological sites relating to physical damage, increased carbon-dioxide levels, histoplasmosis, instability and sinkhole formation, and to develop management strategies accordingly
- To protect the undiscovered potential value of the area by, in particular, limiting development of the dolomitic areas through the application of the land use intensity zoning criteria
- To monitor the sites to allow management regimes to be altered if damage is caused.

#### ❖ SUSTAINABLE GEOTOURISM DEVELOPMENT

The IECMP identifies six land-use intensity zones based on spatial environmental sensitivities, current land-uses and conservation importance to the COH WHS ([http://www.cradleofhumankind.co.za/docs/PART ONE.htm](http://www.cradleofhumankind.co.za/docs/PART_ONE.htm)). It was divided into five land use zones. This 'natural' based zonation system will help guide development while ensuring the sustainable use of the area. The five land use zones are:

1. Paleontological zone
2. Ridges and wetland
3. Very low to low intensity use
4. Moderate intensity use, and
5. Corridor zones.

Development guidelines for each zone were subsequently formulated to ensure that conservation objectives would be met. The purpose of defining land-use intensity zones is to provide for areas of conservation and opportunity within the COH WHS in keeping with the overall aim of conserving the resources of the area while creating opportunities for increased access. In terms of the zonation system proposed, fossil and cave sites are identified as sensitive areas with respect to the types of infrastructure, activities and visitor numbers that can be allowed at these sites. Interpretative facilities catering for large numbers of visitors would fall into moderate or high intensity zones

(<http://www.cradleofhumankind.co.za/docs/chapter1-10.htm>).

The land use zones were used to develop three tourism zones:

1. The least developed and natural heart of the Site is the core zone. Activities here will be limited to low impact, nature-based tourism such as hikes and trails
2. The core tourism zone that contains most of the primary fossil sites and existing tourist attractions. This zone is the focus for tourist activities and interpretation facilities
3. The most densely populated and cultivated peripheral zone. Activities that will be accommodated here would include guesthouses, and bike and horse trails.



To enhance tourism within the zones, the various elements that make up the COH WHS are roads and infrastructure, information and signs, landscape features and land use.

Digginis (2004:68-69) believes that attracting international and local tourists is one of the distinct advantages of having WHS status. Thus, considerable attention has to be given to establishing a tourism development plan to ensure that tourists are attracted to the site and yet, at the same time, that the environment is conserved. For these reasons, the “*Tourism Master Plan*” was developed. This plan takes into account the unique features of the site and identifies opportunities for tourism development. Tourism activities should be guided and not be prescribed. Primary concerns are cultural authenticity and ecological integrity. The underlying principles of the plan are that:

- Palaeo-anthropological and ecological uniqueness is retained
- That commercial facilities do not impact upon the natural landscape and caves; and that
- Where land use is in conflict with acceptable principles, the owner of the land will have to consider making changes.

The plan identifies two main recreation resource bases in the region, natural (ridges and plains) and cultural (fossils). In summary, it can be stated that “*The area is considered suitable primarily for outdoor activities because of the area’s topological and geological characteristics. On the other hand, the cultural component presents the opportunity to develop museums and interpretation facilities that would complement the outdoor experience*”.

#### ❖ **STAKEHOLDER INVOLVEMENT**

There exist private partnerships for Maropeng between the WITS, who owns the land, and the Blue IQ.

#### ❖ **NETWORKING**

The “*Interpretation Network Master Plan*” (INMP) sets out a conceptual framework for an integrated interpretative network for the COH WHS. It also contains detailed recommendations for each of the components including the Interpretation Centre Complex. This proposal for an interpretative approach at the COH WHS is to leverage the unique beauty and scale of the landscape that makes up the COH WHS. It is intended to achieve this by taking a holistic and integrated approach to developing an interpretative framework. Essentially, the interpretative framework aims to tell the story or stories associated with the site to the visitor in the most dynamic, accessible, exciting, meaningful and engaging way. The landscape that makes up the COH WHS provides a dramatic backdrop and context for the most important story of the new millennium - the story of the origins, evolution and continued survival of humankind (<http://www.cradleofhumankind.co.za/docs/part8.htm>).

## ❖ MANAGEMENT OF GEOTOURISM

The objectives of the management plan are aimed at protecting and preserving the scientific, natural and cultural assets of the site, and at managing the site for the benefit of all. In the “*Interpretation Network Master Plan*” (INMP), detailed recommendations for the operation, management and institutional arrangements for the proposed network are given. An implementation strategy and a detailed phased implementation schedule are included.

The Management objectives for the paleontological sites, outlined in the DACEL document, “*Cradle of Humankind, Towards a Management Plan*”, are:

- To promote access to some of the palaeo-anthropological sites which are easily accessible and to provide information about the scientific significance of these sites to the general public
- To prevent unauthorised access to sites and provide adequate protection
- To promote and co-ordinate research efforts
- To establish the risks associated with the increased use of the palaeo-anthropological sites relating to physical damage, increased carbon-dioxide levels, histoplasmosis, instability and sinkhole formation, and to develop management strategies accordingly
- To protect the undiscovered potential value of the area by, in particular, limiting development of the dolomitic areas through the application of the land use intensity zoning criteria
- To monitor sites to allow management regimes to be altered if damage is caused.

The management objectives for the archaeological sites are:

- To promote controlled access to the sites for the general public along trails and provide information about sites
- To promote research
- To protect the resource from scavenging by unauthorised persons
- To monitor the sites to allow management regimes to be altered if damage is caused.

## ❖ MARKETING

The Blue IQ is responsible for the marketing of the whole COH. The promotion of tourism and education is an important objective for the management of the COH WHS as it relates directly to the promotion of conservation and to the economic development of the area. The establishment of excellent facilities for interpretation, research and education play a vital role in leveraging both the economic and social benefits. Demand levels do not increase automatically because of WHS status, but increase rather due to the development of attractions and interpretation centres, underpinned by appropriate marketing.

#### 6.2.5.5 Benefits

##### ❖ CONSERVING NATURAL HERITAGE

Digginis (2004:65) believes that the main benefits of World Heritage Site status is the preservation of a valuable national asset for future generations. Thus, “*Gaining WHS status also serves as a catalyst in raising people’s awareness of the need to preserve the local or national heritage. A sense of pride is developed in a nation when people realise that their culture or natural heritage is recognised internationally as having “outstanding value”*”. A crucial benefit is the access that is gained to the World Heritage Fund. Developing countries in particular benefit from this fund. Financial assistance is made annually for the development and maintenance of the site, and on an *ad hoc* basis to help finance specific projects and training. Emergency assistance can be provided in the event of a natural or human-made disaster that severely damages the site.

Creating opportunities for the WHS to work with other tourism sectors must be addressed in the future.

##### ❖ ENHANCING THE VISITOR EXPERIENCE

The area’s natural and cultural resources are not sufficient of themselves to generate a high level of economic and tourism activity. These resources must be packaged to create a desirable visitor product. To this end, it is recommended that:

- The COH WHS be managed as a single entity to enhance the quality and integration of the visitor experience
- The area should offer the visitor a holistic tourism experience catering to different markets and varied levels of interest, as well as providing access for the elderly and disabled
- Visitor facilities and programmed services be planned and developed in such a way that responsible access is promoted and that provides exciting, enlightening and entertaining opportunities for visitors to explore the area and appreciate its significance; and that
- Opportunities for learning are maximized.

It is also noted that the quality of visitors’ experiences may be affected by:

1. Poor standards of facilities and services, and
2. Lack of information or opportunities for understanding the significance of the COH WHS.

The success of the COH WHS is dependent on providing a high quality visitor experience. This will depend on high quality interpretation by well-trained, competent guides supported by well-planned interpretative materials and facilities.

To develop well-trained competent guides, it is recommended that:

- Trained guides from the local community are used to enhance the quality and interactive experience of visitors
- Investment in the training of guiding staff is essential
- A training strategy that incorporates interaction with the scientific community be implemented
- Tour guides be subject to continuous assessment and offered opportunities to upgrade their knowledge and skills on a continual basis
- Provision should be made to accommodate the requirements of more knowledgeable visitors with particular interests in specific sites.

#### ❖ **GEO-EDUCATION**

There are two excellent visitor centres, Maropeng and Sterkfontein. The Interpretation Centre (IC) is conceived as a single institution comprising the two focused units, with one at Maropeng and the other at the Sterkfontein Caves. Together, they meet the key objectives of the management plan and have sufficient critical mass to enable cross-subsidisation of educational and scientific activity through income generated from tourism activities. It is important that the grouping of these units and their development as a single entity provides an opportunity to develop a unique and substantial attraction in the area. Here every visitor will experience and learn about the COH as the richest hominid fossil site in the world.

The role of conservation of these assets will be practically illustrated. At Sterkfontein, a cave can be visited together with the various exhibitions in the visitor centre. At Maropeng, the focus is rather on exploring humanity's history in the Tumulus building. It is the first of its kind in the world, and was designed to look like an ancient burial mound from the front and, when exiting on the other side, a very modern structure from the rear. The architecture aims to symbolise the journey through time from one's ancient origins to today. These two centres together enable a holistic view of the COH WHS.

At present, there is a network of interpretative facilities, the Interpretative Network (IN). It collectively creates a critical mass of interest. A holistic, educational and recreational, COH WHS visitor experience was developed. The following network components were envisaged:

- A primary interpretation centre, with focused exhibitions on two sites, namely: Maropeng and Sterkfontein Caves
- Site specific interpretation facilities, and
- Visitor information points.

#### ❖ **INTERPRETATION**

Interpretation and orientation play a major role in facilitating visitor management and access. The aim of interpretation is to aid the visitor in discovering and understanding the area and

encouraging learning to ultimately enhance the visitor experience. In developing interpretation material and facilities it should be noted that:

- The level of knowledge of most visitors is limited. Material should therefore be appropriate for visitors with differing levels of knowledge, of education and of different ages
- Interpretation should be informative, based on sound academic research, and aim to increase respect and understanding of the COH WHS. It should not be taxing mentally or ideologically, nor should it be negative
- To encourage repeat visits and remain contemporary, interpretation should be continually updated and amended
- Interpretation should cover a broad story line and not be restricted to the paleontological importance of the site. Different sites, of course, may have different interpretative themes
- All interpretation should have an implicit conservation message to highlight the importance of sustainability
- Interpretation throughout the site should be co-ordinated to ensure that the message being portrayed is consistent, that there is a degree of integration and that duplication of the message is minimised. It is also important to ensure that information is not one-sided and that the whole picture is provided
- Trained guides from the local community should be used to enhance the quality and interactive experience of visitors.

The proposed interpretation and orientation facilities include:

- Museum/primary interpretation centre
- Orientation centre/s
- Site-specific interpretation facilities
- A research and education centre.

#### 6.5.2.6 Future actions

##### ❖ **DEVELOP GEOSITES, GEOPARKS**

The researcher suggests that geosites should be developed to emphasise the role of geology and that the COH should become a UNESCO geopark. This is an option for the future but this possibility should be discussed with the management of the COH.

##### ❖ **BETTER INTERPRETATION FACILITIES**

It was also suggested that that secondary orientation centres be located at key attractions and entry points to the COH WHS, with separate entrances from the primary interpretation centre and museum. Having a somewhat different purpose to Interpretation Centres, Orientation centres are intended to provide information to visitors about the range of activities and

facilities available within the COH WHS so that they can plan their visit. Orientation centres should provide information about:

- The COH WHS code of conduct for visitors
- The extent and significance of the COH WHS
- Visitor attractions in the COH WHS
- Availability of local services and attractions in the surrounding area
- The need for conservation in the area.

It was further suggested that Visitor Information Points (VIPs) should be located at all major gateways to the COH WHS that would serve to provide information to people passing through or entering the area, and to direct them to the interpretative facilities and other attractions. VIPs will vary in size and content and may include:

- Information boards positioned strategically so that visitors can pull off the road alongside them;
- Information kiosks/desks in existing facilities; and
- Exhibitions, information counters and sales areas linked to new or existing tourism information points.

([http://www.cradleofhumankind.co.za/docs/PART\\_ONE.htm](http://www.cradleofhumankind.co.za/docs/PART_ONE.htm),  
<http://www.cradleofhumankind.co.za/docs/six.htm>,  
<http://www.cradleofhumankind.co.za/docs/part8.htm>,  
[http://www.cradleofhumankind.co.za/docs/part\\_11.htm](http://www.cradleofhumankind.co.za/docs/part_11.htm))

In summary, the present interpretation facilities should be upgraded. An awareness campaign about geotourism should be undertaken to let people know what geotourism is.

## 6.2.6 CASE STUDY 6 – GEOSCIENCE MUSEUM, PRETORIA - INTERVIEW RESULTS

A personal interview with a questionnaire was done with Mr. Horst Windisch, past president and patron of the Federation of Southern African Gem and Mineralogical Societies (FOSAGEMS) on the 8 July 2008 in Pretoria. Mr. Danie Barnardo, head of the Information Section, Council for Geoscience (CGS), was interviewed a month later on the 8 August 2008 in Pretoria. Subsequently, Mrs. Anke Raath, temporary curator of the Geoscience Museum (GM), was interviewed on the 11 August 2008, also in Pretoria.

### 6.2.6.1 Background and history

The Geoscience Museum is situated in the Transvaal Museum building, across from the City Hall, in Paul Kruger Street, Pretoria. Secure parking is available in the City Hall grounds. The space is rented from the Transvaal Museum on a contractual basis. Visiting hours are from 8:00 am to 4:00 pm, daily. The Museum is closed to the public only on Easter Friday and Christmas Day.

The CGS is one of the National Science Councils of South Africa, and is the legal successor to the Geological Survey of South Africa, which itself was formed in 1912 by the amalgamation of three former Surveys, the oldest of which, the Geological Commission of the Cape of Good Hope, was founded in 1895. The Geoscience Act, Act 100 of 1993, established the CGS in its present form. Today, the Council is a modern institution, boasting excellent facilities and expertise. The mission of the CGS is to provide expert earth-science information and services to improve the management of natural resources and the environment for a better quality of life for all ([www.platinummetalsreview.com/dynamic/organisation/view/11463](http://www.platinummetalsreview.com/dynamic/organisation/view/11463)). The CGS is also mandated by an act of Parliament, the Geoscience Act, 1993, to conserve and curate the national geological collection. The CGS is further responsible for providing geological earth science knowledge to South Africa. This knowledge is vital to the utilisation of mineral resources, and other earth based and environmental projects ([www.geoscience.org.za/index.php?option=com\\_content&task=view&id=94&Itemid=283](http://www.geoscience.org.za/index.php?option=com_content&task=view&id=94&Itemid=283)).

The GM provides educational facilities and information to scholars, tourists and members of the public in the form of displays, rock-, mineral- and fossil-identification services, brochures and worksheets. The Museum's gem, mineral, meteorite and rock collection is recognised as one of the best of its kind in Africa. The collection is available for both research and viewing purposes. Multi-lingual Geoscience Museum security and education staff is always available in the exhibition halls to provide help and information about the displays. Guided tours by appointment are also available - especially for schools - and include display-based worksheets. Bookings for such guided tours may be made through the Transvaal Museum Education Department, or by phoning the Geoscience Museum directly. Specialist earth sciences information (including geochemical analyses of geological samples) is available at the Laboratory based at the CGS Head Office in Silverton. From time to time, special exhibits will be displayed. In collaboration with the Pretoria Gem and Mineral Club, activities such as specialised lectures, field trips and workshops can be arranged.

The Staatsmuseum (State Museum) of the ZAR was founded on 1 December 1892. This is now known as the Transvaal Museum, a natural history museum in Pretoria. The Transvaal Museum was amalgamated with the Pretoria-based National Cultural History Museum (also called the African Window) and the South African National Museum for Military History (situated in Johannesburg) on 1 April 1999 to form the Northern Flagship Institution (NFI).

Dixon (1992:57-77) says that in 1897 (by) a declaration in the Staats-Almanak of the Zuid-Afrikaansche Republiek, the establishment of a new section of the Department of Mines, the Geological Survey, was established. Its task was to "*put together a collection of minerals and rocks, in particular of the South African Republic and other South African States, for scientific investigations and public displays in the Museum of the Geological Survey*". The first collections were housed in the State Gymnasium, on the corner of Bosman and Vermeulen streets, where the Post Office Headquarters used to be. The new Museum Building (Transvaal Museum) was completed in 1913 for natural history collections. Two

wings were added in 1990 to the north and south of the main building. A full-time artist designs and plans the exhibitions and at present, she is the acting curator. Two new posts were recently created, that of curator, and that of a geoscientist, to look after the collections. The previous president of the Federation of FOSAGEMS is working on a voluntary basis at the GM. Marketing of the GM is now done by the CGS.

#### ❖ **GEODIVERSITY, GEOLOGICAL SIGNIFICANCE**

The GM has one of the largest mineral collections in Africa, with over 9 000 specimens on display, out of approximately 26 000 specimens. Also on display is a piece of moon-rock, one of the biggest selection of South African meteorites and an extensive display of vital economic minerals. Other GM highlights include a display of the GM gemstone collection with some of the best gemstones in the world, together with models of well-known gemstones. A systematic mineral collection, displayed according to Dana's system of mineralogy, is one of the latest additions.

The palaeontological collection of the Council for Geoscience is a large, valuable and unique collection. Highlights include some of the best Karoo Supergroup (Permo-Triassic) mammal-like reptile and ray-finned fish fossils in the world. This collection, too, is available for research and viewing purposes. A new display exhibiting highlights of the collection was planned for early 2009.

The information kiosks plan to provide a unique, hands-on introduction to the Universe, the Solar System, and the Earth and its scientific secrets, including mineral and fossils – but they were not working at the time the research was undertaken. Plasma touch screens with geological information will be used in the future. A new database was recently completed. Plans have been made for every specimen in the collections to be photographed and that information will then be made available on the Internet. The latest addition to the Geoscience Museum displays is the O'Okiep collection, donated by Professor Emeritus T. Clifford of the University of the Witwatersrand.

The GM has hosted exhibitions from Taiwan and Russia in recent history.

#### ❖ **GEOCONSERVATION**

One of the respondents (Windisch) noted that geoconservation was not really part of the museum's activities. The fact that minerals, geological specimens and fossil are conserved in the GM is itself a sign of geoconservation. If this were not the case, some of these specimens would have landed up in a crusher and would thereafter be lost to society. It was mentioned that some of the private collectors of minerals and geological specimens have some of the meteorites in the land – but this is not generally known. Years ago, it was proposed to conserve South Africa's outstanding mineral specimens by legislation, and that they should not be collected, but this proposal appears to be impractical



Windisch (2007:2-3, 6) notes that geoconservation is “*the action of conserving, preservation from destructive influence, decay or damage*” and collecting is “*to gather into one place or group or to make a collection of specimens*”. Thus, collecting is a form of conservation – combating destruction. Collecting is a method of conservation because:

- Donations and acquisitions are held by Museums
- Teaching material is held at Universities
- If not collected – the material’s final repository may be the crushers
- Restricted specimens in South Africa – gold, diamonds, fossils, meteorites – may not be seen or handled except *in situ*
- Restrictions exist in Namibia and Zimbabwe, for example, where export permits may be required.

The role of the amateur collector in the field of geology and mineralogy is:

- As geologists and mineralogists locating old deposits
- Many finds of minerals found by amateurs are of species not previously recorded in South Africa. This is because professional mineralogists are more interested in the economics of the deposit, whereas amateur mineralogists are more interested in the mineral species at a deposit
- Providing help in advancing the geological sciences in the country and the world.
- Providing data to professional organisations, that they might not otherwise have been aware of, such as the mineralogy
- Creating collections for the amateur’s own pleasure - and often that of others as well.

#### ❖ **OTHER, SUPPLEMENTARY TOURISM PRODUCTS**

The Museum Park is supported by the Pretoria City Council, to group together other museums near the of the Geoscience museum, and is administered by the NFI. It is a non-profit organisation. Other supplementary tourism products are:

- Transvaal Museum (Museum of Natural History)
- Geoscience Museum
- Melrose House Museum
- Science and Technology Museum
- National Cultural History Museum
- Sammy Marks Museum
- Kruger House Museum
- Voortrekker Monument
- Pioneer Open Air Museum
- Pretoria Art Museum
- Anton van Wouw House
- Pierneef Museum.

#### 6.2.6.2 Present status

##### ❖ **RESOURCE ANALYSES**

During the interviews, it was established that:

- The museum was a good building with well-preserved collections and the correct people to do the job
- The museum contains good and well-preserved geological collections
- The museum fulfils social-educational responsibilities
- The museum is funded by the Council for Geoscience, which is partially funded by the State.

##### ❖ **HOW IS SUSTAINABLE GEOTOURISM BEING IMPLEMENTED?**

A printed-out definition of sustainability was given to every respondent before the interview, either by e-mail or personally. During the interviews, it became clear that sustainability was a concept that was not well understood. The respondents did not give an answer.

##### ❖ **SWOT ANALYSIS:**

During the personal interviews with Mr. Horst Windisch, Mr. Danie Barnardo and Mrs. Anke Raath, very valuable information was obtained. The SWOT analysis (Strengths, Weaknesses, Opportunities and Threats) proved to be very informative when compiling an overview of key issues at the Geoscience museum. Not every person gave the same answers; so their responses were grouped together and were then integrated in the results below.

##### ▪ **STRENGTHS**

The strengths that were identified were:

- The museum has one of the biggest geological collections in Africa – it is a depository of minerals of SA
- Good exhibits, well presented (particularly the economic minerals) exist
- There are large showcases that allow ample room
- The managed collections are properly documented
- The conservation aspect is collecting
- There is a good administration by CGS – two new posts of curator and collections manager were created to increase effectiveness
- Excellent educational activities are offered
- The Moon Rock specimen is exhibited.

##### ▪ **WEAKNESSES**

The weaknesses that were identified were:

- The Museum does not have its own building – it is still housed in the

Transvaal Museum, and only a few people know that it is administered by the CGS

- Very little promotion and marketing is undertaken
- Not enough finance is available
- Too few staff – although the additional staff members will help solve this problem
- Space is rented on contract from the Transvaal Museum
- No geology-specific museum shop with promotional material, books, videos, and geological specimens exists
- The museum restaurant is poorly sited
- Poor planning is proven by the absence of a strategic plan
- No SWOT analysis of the museum had been undertaken
- No business plans were studied or implemented
- The NFI does not have enough capital available for upgrading of facilities.

#### ▪ **OPPORTUNITIES**

The opportunities that were identified were:

- South Africa has a rich and unique geological mining history, even if too little is known of it. So the economic collection should be re-vamped
- Plan, formulate, implement and evaluate a strategic management plan;
- Complete a resource analysis
- Upgrade the collections
- Have more exhibits in the building
- Institute moving exhibits
- Begin an own geology-focussed, strategically placed, souvenir and curio museum shop.

#### ▪ **THREATS**

The constraints that were identified were:

- Too little financial support is available
- The potential closure of the museum
- Because of the physical location of the building, it was unsafe to walk outside the building in the late afternoon. The visiting hours had been adjusted from 17:00 to 16:00 to increase the security of visitors
- There is little finance available because:
  - No teaching of geology at schools is done
  - Not enough promotion is done
  - The Museum obtains money from the State and this might not be forthcoming in the future.
- The downturn of the economy.



Figure 6.8: Exhibition of the letter by ex-president Richard Nixon (USA), to present the flag which was carried to the moon during the Apollo Lunar Landing Program (1973) to South Africa, Geoscience Museum, Pretoria

### 6.2.6.3 Lessons learned

At present, there is little financial support from Government, the local municipality or mining/financial companies. The South African Resources Agency (SAHRA) has a very important role to play – but to date heritage has been taken as meaning cultural heritage, even though they are supposed to give support and guidance when planning new ventures such as geosite development.

### 6.2.6.4 Implementation of sustainability

#### ❖ STAKEHOLDER INVOLVEMENT

The various stakeholders are listed below:

- Department of Mineral and Energy Affairs (DME)
- Department of Science and Technology (DST) – some of the museums fall under them,

- Department of Arts and Culture (DAC) – some of the museums fall under them, that is, NFI, Iziko
- South African Resources Heritage Agency (SAHRA). In 2007, the Annual Conference was held at the Cradle of Humankind
- South African Museums Association (SAMA)
- Museum Park
- Universities
- Gemmologists
- Volunteers are not available – although there is a need for them.

#### ❖ NETWORKING

Networking should be done with museum associations, universities, gemmologists and the tourism sector in Pretoria so that the networks can be improved and so they can become more fruitful.

#### ❖ SUSTAINABLE GEOTOURISM STRATEGY

There is little knowledge of geotourism, and this should be addressed. Furthermore, no strategic management plan exists regarding the development of geotourism. In the immediate area of the museum, there is an abundance of other museums that are managed by the Museum Park in Pretoria.

During the planning, management, marketing of a strategic plan particular attention should be given to the following:

- There is no bookshop to sell pamphlets and information about the museum
- The restaurant facilities poor and improvement is necessary
- There are no marketing, promotion or TV programming about the activities of the museum.

#### ❖ MANAGEMENT OF GEOSITES

The GM can be regarded as a place of geological interest, and can thus be classified as a geosite. The geological collections are managed *par excellence*.

#### ❖ MARKETING

Marketing is now being undertaken by the CGS. Even so, very little marketing is currently being done. Promotional material should include geological maps, books, videos, posters, and geological specimens. Marketing should also be done at the international airports in Johannesburg, Cape Town and Durban. Audio tours in modern languages similar to that at the Origin Museum, University of the Witwatersrand, should be initiated. To make people

aware of geotourism, the collections should be explained with pamphlets, articles and TV programming.

#### 6.2.6.5 Benefits

Conservation and education is just one of the tasks of the museum. A mandate from Parliament exists to conserve and curate our natural geological collections. Tourism operators arrange visits to the GM. Overseas tourists arrive in groups or as individuals. The Geoscience Museum is internationally known. Therefore, opportunities can be created to work with other tourism sectors for a mutual advantage.

#### ❖ ENHANCING VISITOR EXPERIENCE

To enhance the visitor experience, the following aspects of geology are discussed when explaining geology to schools and other visitors:

- The Solar System and planet Earth
- The Moon Rock
- The age of the Earth
- Minerals from volcanoes
- Rock types and continental drift
- African fossils
- Tswaing Meteorite Crater and meteorites
- South Africa's mineral wealth
- South African minerals and people
- Gold is a metal of kings and queens
- The world-famous Witwatersrand Goldfields
- Diamonds - but this is probably not emphasised enough
- What is a mineral?
- How minerals are identified?
- What is a crystal?
- What are gemstones? and
- People and gemstones.

A museum shop is an absolute necessity further to enhance the visitor experience. More activities and “*action*” in the museum are necessary. A bookshop with appropriate promotional material will enhance the visitor experience before and after a tour. Much can be learned from a few mining museums in Germany:

- Das Deutsches Bergbau-Museum (German Mining Museum) in Bochum (Germany)
- Das Deutsche Schieferbergwerk Museum (German Slate museum) in Mayen (Germany)
- Das Deutsche Vulkan-Museum (German Volcano Museum) in Mendig (Germany)
- Roman Mining Museum in Kretz (Germany).

## ❖ GEO-EDUCATION

South Africa lags behind much of the rest of the world. This is not good enough and more education has to be done. Geo-education is mostly geared towards schools. School visits form an important part of educating learners about geology. This type of visit should be extended to the nonprofessional. There is a lack of labour at the museum– therefore volunteers should be sought.

## ❖ INTERPRETATION

Interpretation must be structured in such a way so that the nonprofessional will understand it. With possible new collections in the future, there might be better interpretation.

### 6.2.6.6 Future actions

At present, no geoparks with museums as a part of their infrastructure exist in the country. This short-coming should be seriously considered when a geopark is planned for the Pretoria area. Not enough research is being undertaken by the Geoconservation and Geotourism Committee of GSSA – there is no planning currently regarding the development of geosites and geoparks.

Better interpretation facilities can be expanded because the CGS has six short videos. Audio presentations should be produced. Books, posters, maps, CD's, videos, slideshows, postcards and fabricated items should all be part of an awareness campaign. Upgrade the CGS website - the museum section should be a separate one.

Only geo-excursions for geologists have been undertaken so far – these are not for the non-professionals. Conferences and congresses overseas on the topics of geotourism, geoparks and museums should be attended for the geology museum staff to remain well informed of the latest developments for later implementation in the museum. The Department of Tourism and the Environment (DEAT) should be involved in the activities of the museum to a much greater extent.

## 6.3 CONCLUSION

The conclusions that were drawn will be grouped as general criteria of lessons learned and of the implementation of sustainability.

### 6.3.1 GENERAL CONCLUSIONS

General conclusions from the case studies are given below:

- Four of the case studies were located in protected areas

- The Big Hole Diamond Theme Park (Kimberley) and the Geoscience Museum (Pretoria) are located in an area/building and both of them are protected because they have specific visiting hours
- The case studies were representative of geosites/areas in South Africa. They cover virtually all aspects of geotourism - in a National Park, a gold mining heritage town, a visitor gold mine, a diamond theme park, cave systems developed as a World Heritage Site for anthropologic reasons and a geological museum
- The new concepts of geodiversity (instead of geology), geoheritage, geotourism and geoconservation were introduced, and explained to the respondents. Brochures about typical geotourism activities in Europe were also shown to illustrate the meanings of the terms. This gave everyone an understanding of what geotourism means. The same methods were applied in every case study with regard to geotourism
- Every case study had sufficient supplementary products to complement geotourism in future
- Every case study had a good website and infrastructure
- The SWOT analysis (Strengths, Weaknesses, Opportunities and Threats) was a very useful tool to form an overview of key issues to be used in strategic plans, including business plans. The present strengths and weaknesses of the situation and future possibilities for opportunities and threats were identified. The analysis also helped to articulate issues that had not come out in other ways. The weaknesses and threats can become strengths and opportunities if properly addressed. A SWOT analysis was done for all the six case studies. Not even one sustainable geotourism strategy exists, although Kimberley's Big Hole had a limited-focus undertaking in this area.. The SWOT analysis proved to be the most valuable resource from the case studies. It will serve as a basis to be used as guidelines for future planning, development, management and marketing for geotourism in the country. The weakest point was that geotourism is a new concept that was not being implemented as very few people had knowledge of it
- Benefits that were recognised during the interviews are that geoconservation, interpretation, geo-education and the visitor experience can successfully be used to make people more aware about the importance of geology and geodiversity
- It became clear that future actions must be to develop geosites and geoparks with a well-prepared management plan for geotourism. However, moving for WHS Listing should be treated with caution as in South Africa such proposals are often seen as being very politically motivated.

### 6.3.2 CRITERIA OF LESSONS LEARNED

The criteria of lessons that were learned are given below:

- **Little/no knowledge of geotourism**

During the interviews with all the respondents it became clear that in all cases the main problem was that there was little or no knowledge of geotourism. After explaining the



concept to them, the respondents had a better idea of what it was about and how it could be used for the socio-economic benefit of the area/place and geo-education of the nonprofessional. Therefore, education is vital. School groups should be informed with hands-on displays about geotourism. Books and brochures must supplement this experience. Schoolchildren were fascinated by rocks, the mining equipment and the small museum at Kromdraai. In the COH, it was established that geology was not greatly emphasised because the palaeo-anthropological view of the WHS was the dominant theme. The role of geology was also not well understood.

- **Policy/strategic geotourism development plan**

No strategic management plan for geosites existed in most cases and this should be addressed in future. The planning, management and marketing was exceptional, however, for the new Visitor's Centre at the Big Hole in Kimberley and the COH:

Kimberley is a new and emerging business. At present it is a world class diamond experience destination

- Of all the case studies, the COH was the best example where exceptionally good planning provided guidance for the development of the COH as a prime tourist destination in Gauteng in the *"Tourism Analysis Report"*. The planning process started with a very systematic preparatory planning phase before mid-1999 where a number of specialist studies were formulated. A comprehensive *"Integrated Environment and Conservation Management Plan"* followed in 1999. This plan articulated a clear justification for World Heritage listing. The master plans were consolidated into a single report *"Integrated Report for the Development and Management of the Cradle of Humankind World Heritage Site"*. The integrated planning for the COH WHS altogether took four years. Although the Tourism Analysis Report was intended for tourism only, it can also be applied to the case of geotourism.

- **Financial support from government, local municipalities, mining/financial companies**

- **Geotourism investment**

De Beers invested R50 million for the renovation and extension of Big Hole in Kimberley. There was financial support for the COH from the government and private stakeholders where the Cradle of Humankind development cost R347-million. In the rest of the cases, investment is sorely needed. Little financial support from Government, local municipalities, mining or financial houses was given at the other case studies. Under-capitalisation was a problem in all the cases

- **Geoconservation legislation**

At present, there is no geoconservation legislation in South Africa and this should be addressed in future.

### 6.3.3 IMPLEMENTATION OF SUSTAINABILITY

Before the interviews, a print out offering a definition of sustainability was given to the

respondent either by e-mail or personally. During the interviews, because the respondents did not give an answer, it became clear that sustainability was a concept that was not well understood. The concept of sustainability appears relatively unknown because it was a virtually unknown concept to the respondents. Therefore, no conclusions could be drawn from the interviews. Simply, the basics of sustainability are not understood. Thus, training is necessary so the concept can be implemented in future. Nevertheless, to market the concept will require a great effort.

The following was observed with regard to the implementation of sustainability:

- Overseas research and experience in geotourism development is necessary but the principle of sustainability is not well understood in a third world country. The layman is not aware and does not has a knowledge of geotourism
- The enhancement and integration of economic, social and environmental principles is a prerequisite
- Even with a well-prepared, sustainable geotourism strategy, sustainable geotourism development will be a new challenge for all the geosites/areas
- In all the cases, there were sufficient stakeholders. Much more can be done with them so that they all work together by means of networking for mutual advantage.
- Management of geosites should be done according to business management practices and principles
- Geotourism was not part of the existing management plans. Greater awareness and better knowledge of geotourism must be sought
- Not enough marketing has been done so that the nonprofessional understands the concept of geotourism and its benefits.

**NOTE:**

Figure 6.9: LANDSAT image of the Kruger National Park and environment (see page 315)

Figure 6.10: Topography of the Kruger National Park (see page 316)

Figure 6.11: Rainfall of the Kruger National park (see page 317)

Figure 6.12: The geology and geosites of the Kruger National Park (see page 318)

Figure 6.13: Soils of the Kruger National Park (see page 319)

Figure 6.14: Vegetation of the Kruger National Park (see page 320)

Figure 6.15: Ecozones of the Kruger National Park (see page 321)

Figure 6.16: Geosites in the Kruger National Park (see page 322)

These figures are still being drawn and are in the process of change (July 2009) and represent aspects of the case study of the KNP.

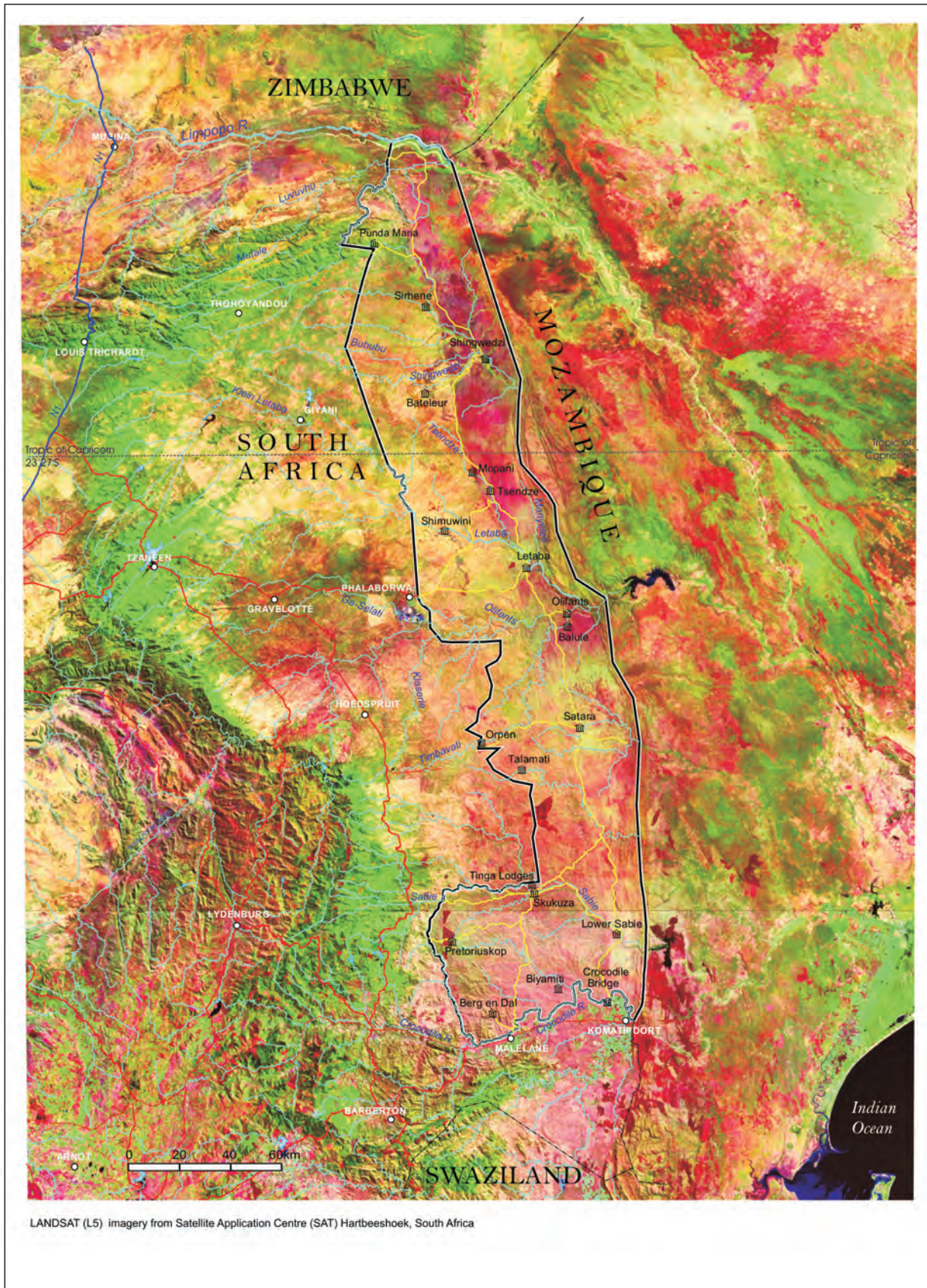


Figure 6.9: LANDSAT image of the Kruger National Park and environment

# Topography



Adapted from **Prime Kruger**, a Prime Origins Guide to the Kruger National Park, ND

Figure 6.10: Topography of the Kruger National Park

# Rainfall



Adapted from **Prime Kruger**, a Prime Origins Guide to the Kruger National Park, ND

Figure 6.11: Rainfall of the Kruger National Park

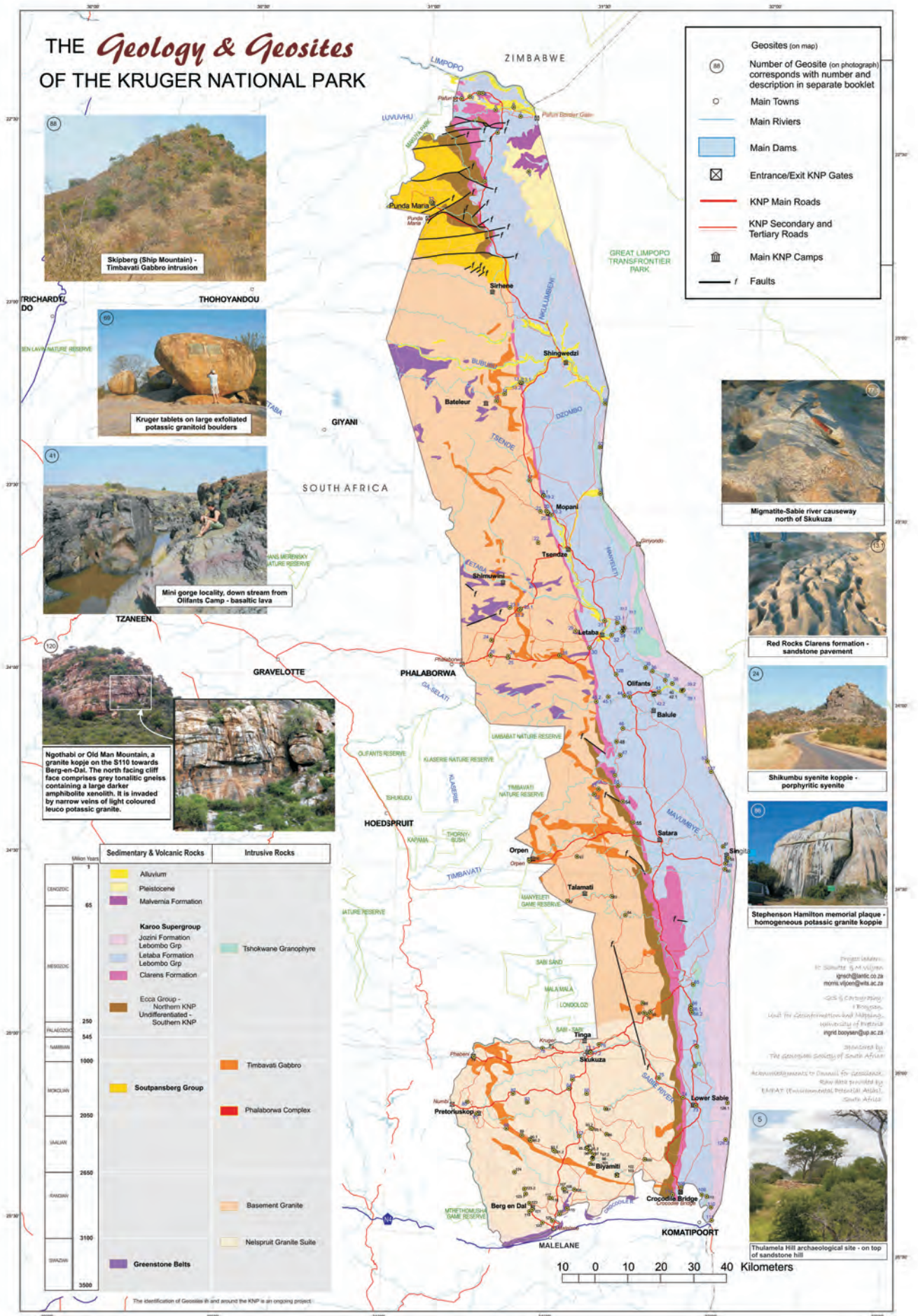


Figure 6.12: The Geology and Geosites of the Kruger National Park

# Soils

(Venter, 1990)

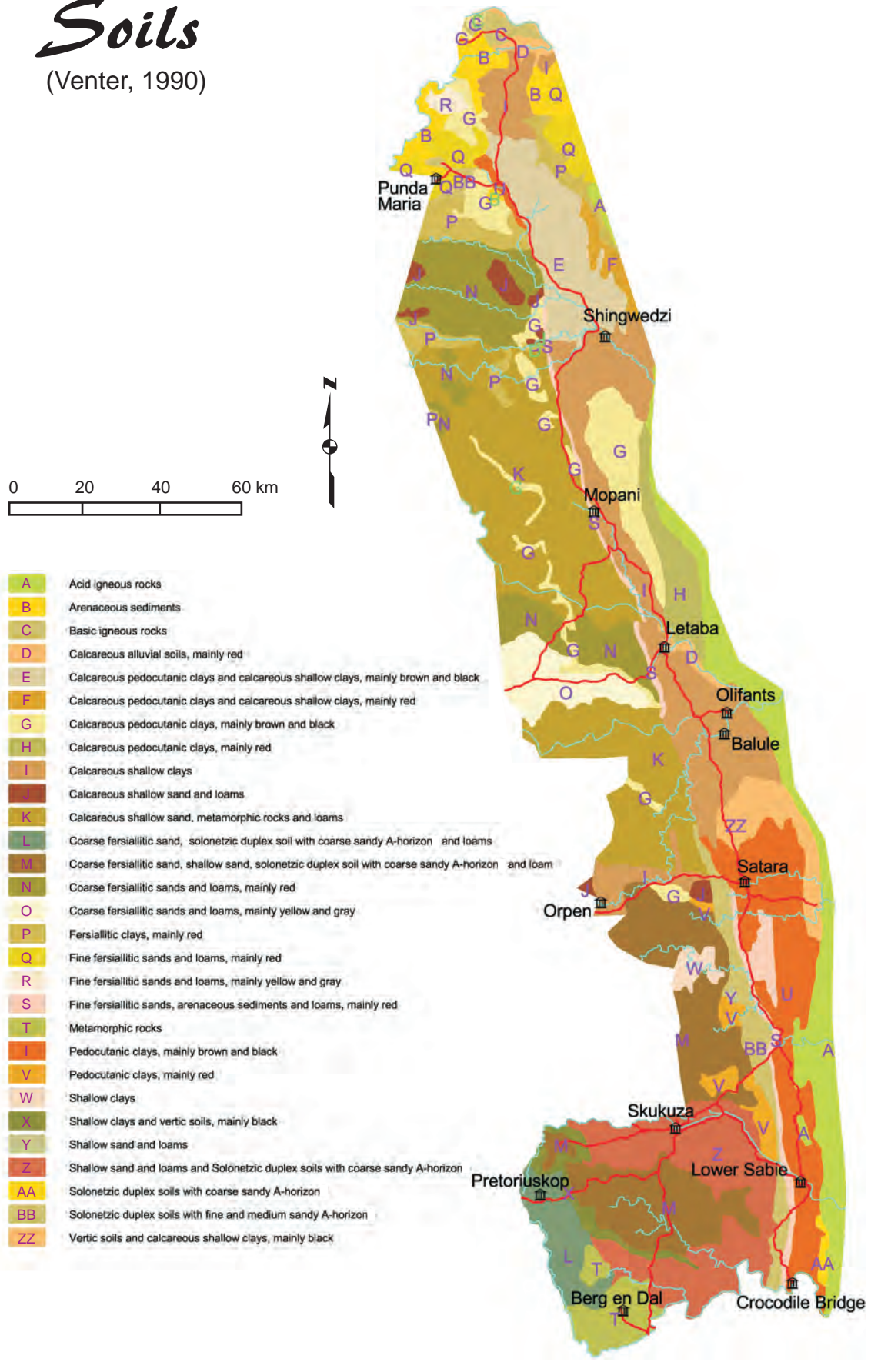


Figure 6.13: Soils of the Kruger National Park

# Vegetation

(Mucina *et al.*, 2006)

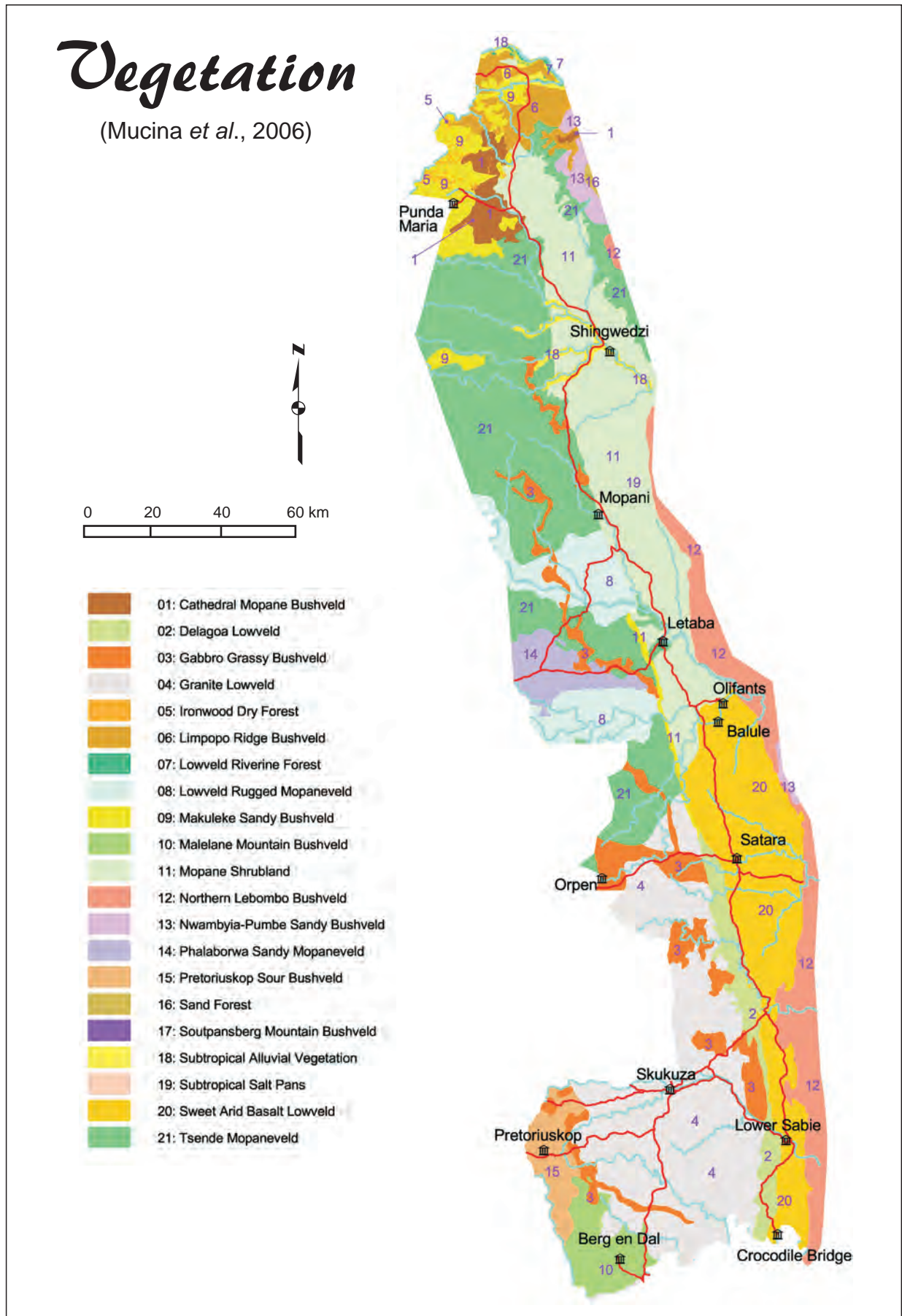


Figure 6.14: Vegetation of the Kruger National Park



# Ecozones

(Jacana, 1999; revised by the Kruger National Park in 2009)

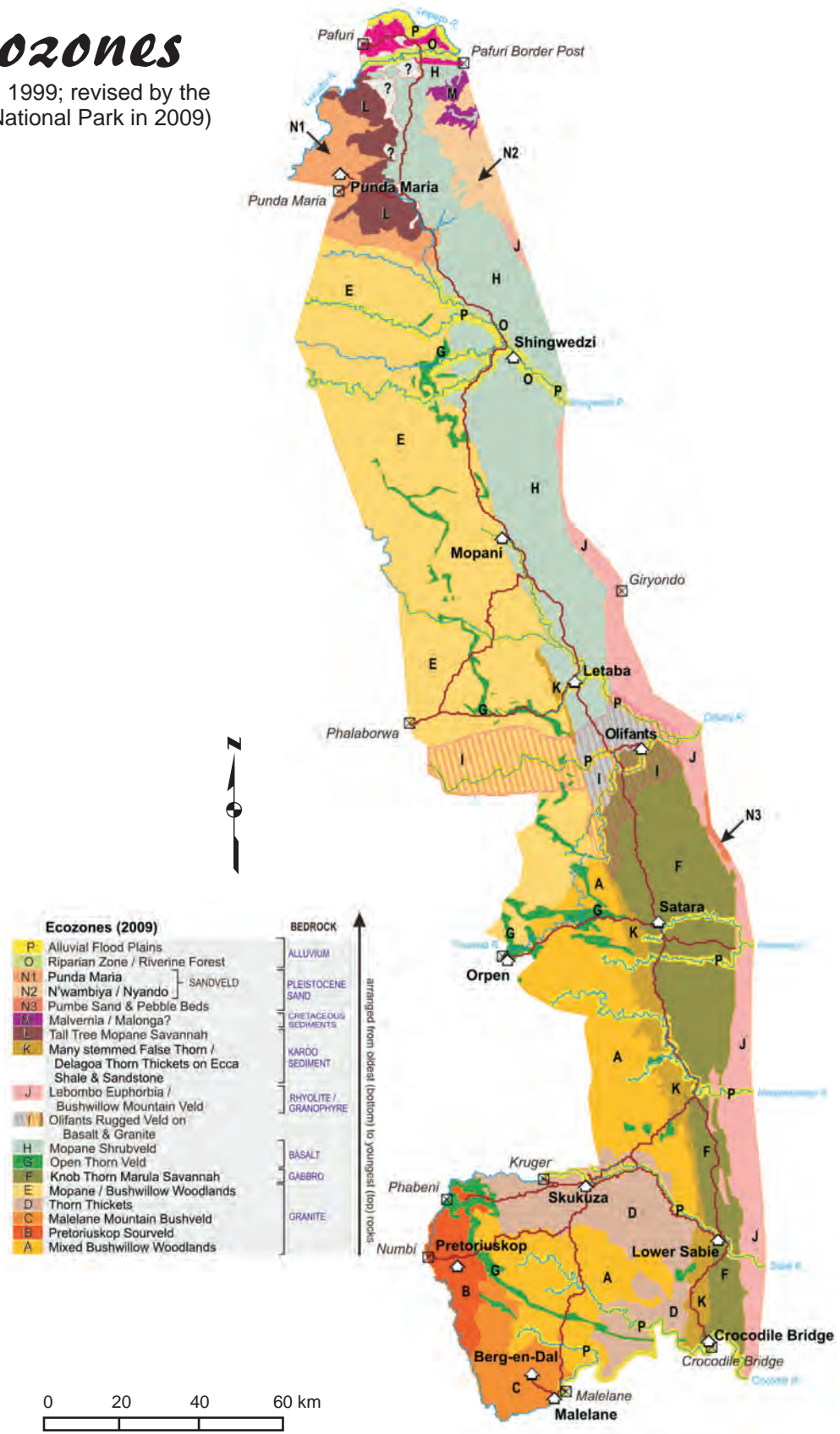


Figure 6.15: Ecozones of the Kruger National Park

# Selected *Geosites* in the Kruger National Park, South Africa

Ingrid Booysen



**69** Kruger tablets on large exfoliated potassic granitoid boulders.

-24.8715800  
31.7747000



**60** Cliffs of rhyolite and granophyre. Eastwards view from Shwembi river bridge near Nwaneszi lookout.

-24.4731800  
31.9754800



**52** Timbavati gabbro (on the S39) south of Timbavati picnic spot.

-24.2875000  
31.5755800



**41** Details of flow top breccia in the mini gorge down stream from Olifants Camp, on the S44. Amygdaloidal lava fragments in reddish matrix can clearly be seen.

-24.0000700  
31.7527500



**77.1** The dyke and its contact with granite gneiss - north of the Sabie river causeway.

-24.9890400  
31.6016700



**51** White vein on the right hand side of the road (S39).

-24.2860200  
31.5770700



**13.1** One of the lookout points at Red Rocks - Potholed Clarens sandstone.

-23.1741800  
31.3022500



**74** Clarens sandstone Luby luby tributary, Lower Sabie road

-25.1008900  
31.8850500



**35** Banded rhyolite (pinkish-orange) with good flow banding just south of Engelhard Dam on the S46 - lookout to the east across Letaba river.

-23.9354200  
31.7105800



**46** Resistant rhyolite dyke cliff with basalt lava flows on the side - Timbavati river on the S39.

-24.0135300  
31.6513300



**47** A classic example of the weathering of a jointed, massive felsic rocks (on the S39).

-24.1767200  
31.6474600



**80** Shabeni is a potassium-rich granite koppie, northwest of Pretoriuskop.

-25.1415200  
31.2395700



**58** Resistant granophyre ridge east of Satara - near Singita Private Lodge.

-24.36860  
31.98880



**7** Dolerite dyke in cutting on Baobab Hill on the main road, south of Pafuri.

-22.4940600  
31.203070



**82** Napi Boulder - large, rounded boulders of homogeneous exfoliated potassic granite.

-25.1126300  
31.3757800



**77.2** Migmatite-Sabie river causeway north of Skukuza.

-24.9905100  
31.6017300



**20.1** Mopani camp restaurant and ladies bar - Clarens formation sandstone.

-23.5205400  
31.3954700



**17** Tropic of Capricorn.

-23.4389500  
31.3417100



**19.1** Petroglyphs are engraved (inset) onto exfoliating, domical - lichen covered - reddish brown Clarens Sandstone (main photograph)

-23.4781300  
31.3842500

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Acknowledgements: Geological Society of South Africa, Council for GeoScience and the Kruger National Park

Number of Geosite corresponds to a unique number in a more detailed Geosite Database of the KNP.

Figure 6.16: Geosites in the Kruger National Park