Preface

I thank you for allowing me the opportunity to say few words of thanks on behalf of the Government and the entire Staff members of the Ministry of Environment and Tourism.

First of all, I would like to give my sincere thanks to the Austrian Government for having make funds available for these studies to be undertaken.

Secondly, I would give my utmost gratitude to those who compiled these two Volumes. These Volumes have been long overdue, but at last we can breath a sight of relieve now that they are available.

Thirdly, I am told that the process leading to the development of these two Volumes were very democratic and participatory involving broader community participation throughout the compilation, consulting and writing stages. On this ground, I must congratulate you for the work well done!

Fourthly, the North-western region has got a very sensitive and fragile environment Namibia ever had. On the other hand, it carries a greater potential for tourism but carries a great potential for tourism related activities. Therefore, it would be advisable to those communities to utilize their environment in a more sustainable and appropriate manner or methods and conserve it for future generations. You should start planning activities according to the required standard and do consider the carrying capacity of the areas very seriously as well.

We would, therefore, see these Volumes been fully utilized by the respective people of the two Regions (namely, the Kunene and Erongo) in their planning, programmes and activities, and not turn out to be another waste documents!

Last but not least, I would like to request the people of the two Regions to make reference or have these Volumes to serve them as reminders, whenever doing planning or developing a tourism enterprises.

P.N. Malima MP
Minister
Ministry of Environment and Tourism

Date: September 1st, 2000
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FUNDING AGENCY

The preparation of the North-West Region Tourism Master Plan in support of Community Based Tourism Development in Namibia was funded by the Federal Ministry for Foreign Affairs of the Republic of Austria. Dr. Michael Reinpracht from the Austrian Development Corporation represented the Republic of Austria on this project.
1. BACKGROUND

1.1 INTRODUCTION

In 1991, the Namibian Cabinet declared tourism as a priority economic development sector in the country. Accordingly the First National Development Plan (FNDP1) for 1995 – 2000, spells out the needs and objectives for national tourism development in Namibia.

In 1992 the National Planning Commission (NPC) together with the Ministry of Environment and Tourism recruited consultants to undertake a tourism development study for Namibia. As a result of this study (Hoff and Overgaard, 1992), the National Tourism Development Plan for 1993 – 1997 (NTDP) and Action Programme were drawn up. The NDTP outlines strategies and concepts that are then detailed in the Action Programme. Building on the NDTP, the White Paper on Tourism was drawn up and was approved by Cabinet in 1994. Together with the NDTP and the draft tourism policy, the White Paper and the draft Tourism Act will all be consolidated into the Tourism Act. Both the draft Tourism Act and the NTDP make provision and strong recommendations for regional tourism development plans.

In the above-mentioned plans and draft legislation, emphasis is laid on developing low-impact Community Based Tourism (CBT) as a key strategy for conservation as well as the social and economic empowerment of local communities on communal land. This is reiterated in the Communal Area Conservation legislation (June 1996 - amendment to Nature Conservation Ordinance No 4 of 1975) and the Community Based Tourism Policy (June 1995).

The north-west of Namibia has experienced considerable tourism growth over the last decade. This growth has been effectively harnessed by the formal tourism products in the main centres and commercial farming areas. Although the communal areas have experienced similar tourism growth the residents have realised little return from wildlife and tourism over the same period. This, combined with the particularly sensitive environment of the north-west, resulted in the Kunene and Erongo Regions being identified by the Ministry of Environment and Tourism (MET) as a priority area for effective tourism development planning. To this end, funding was accessed from the Republic of Austria, and Urban Dynamics Africa appointed by the Policy Planning and Management Information Unit (PPMIU) of the Namibian Ministry of Environment and Tourism (MET) to undertake a tourism master plan for the North-West Region of Namibia.
1.2 STUDY OBJECTIVES AND PLANNING AREA

The three main objectives of the Master Plan are:

- To provide a physical, institutional, policy and management framework to guide the development of tourism in the North-West Region, for the primary benefit of decision and policy makers operating in the area.

- To establish CBT as a key strategy for the conservation and protection of the sensitive environment which characterises the region, particularly its fragile ecology and cultural diversity.

- To establish CBT as a key strategy for increased investment, control of resources and income generation by local communities in the development of tourism in their area.

1.3 STUDY AREA

The North-West Region, comprising the Kunene and Erongo Regions, has a combined surface area of 207974km. These two regions are located in the north-western corner of Namibia and have a perimeter of approximately 3172 km. (See location Map No 101). Although not very large compared to the Namibian context, it is of interest to note that these two regions are nearly as large as the whole of Uganda (235796km).

The Erongo Region comprises the 1979 Magisterial districts of Omaruru, Karibib, Swakopmund and the Walvis Bay enclave, but excludes that part which is common with Diamond Area No.2. To the north, the Region is bordered by the Kunene Region, to the east the Otjozondjupa and Khomas Regions, to the south the Hardap Region and to the west the Atlantic Ocean. The Region comprises 5 constituencies: Swakopmund, Walvis Bay, Omaruru, Karibib, and Brandberg.

The Kunene Region comprises the whole of Kaokoland, Damaraland (north of the Ugab River) and the 1979 Magisterial district of Outjo. This Region is named after the Kunene River which forms the north-western border of Namibia with Angola and also most of the northern boundary of this Region. To the east the Region is bordered by the Omusati Region as well as the Etosha National Park (which is part of the Omusati Region), to the south-east the Otjozondjupa Region, to the south the Erongo Region and to the west the Atlantic Ocean. The Region consists of 6 constituencies: Ruacana, Opuwo, Sesfontein, Khorixas, Kamanjab and Outjo.

In this study, emphasis will be placed on low impact community based tourism as a key strategy for conservation on the one hand and economic empowerment of local
communities on the other. Tourism is well developed in the commercial centres such as Walvis Bay, Swakopmund, Henties Bay, Usakos and Kamanjab. However, the greater part of the study area comprises communal land under "control" of local rural communities. This study therefore focuses on the communal land within the North-West Region and explores the potential to boost local involvement in the tourism sector. (See Base Map No 102).

The communal land or "Focus Area" located within the North-West Region is indicated on Map No 103. The study focuses on developments and development proposals within the focus area. Nevertheless commercial farmlands or registered parks within or adjacent to the North-West Region have also been considered during the course of the study. Tourism development in a National and Regional context has been considered to provide perspective to developments within the communal areas.
2. DEMOGRAPHY

2.1 INTRODUCTION

Relative to its total land mass of 824 000km², Namibia has a small population. The projected 1998 population is 1.75 million people up from 761 000 in 1971, 1,026 million in 1981 and 1,45 million in 1991 (NPC; 1994) (DCC; 1981) (DOS1979) (NPC:1994A). Since 1971, the population of Namibia doubled in approximately 23 years with the estimated 1994 population of 1,546 million. At the current growth rate the population will double again by the year 2017, within 23 years from 1994.

The total population for the North-West Region in 1991 was 142 426 and the projected population for the year 2000 is 191 896. This represents only 8% of the total Namibia population. With a total surface area of 207 974km² the average population density of the North-West Region is a mere 1.08 persons per km².

2.2 POPULATION AND POPULATION DENSITIES

The Kunene and Erongo Regions are divided into 7 administrative districts which are also the only common geographical breakdown in population figures for the 1970, 1981 and 1991 censuses.

Table 2.1 provides the population figures for the North-West Region by district, based on the 1970, 1981 and 1991 census figures.

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<td>26176</td>
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<td>85342</td>
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As can be seen from the table, the district of Outjo has had a population decline with the Karibib District recording very low rates of population growth.
In contrast, Damaraland experienced a very high growth rate between 1970 and 1981 (5.8%) and Kaokoland experienced a growth rate of 4.5% between 1981 and 1991. The latter growth rate is the third highest in Namibia during this period. (See Table 2.2)

The total surface area of Kaokoland (58190km²) is the largest of the 7 districts, whereas Walvis Bay is the smallest. Map 201 indicates the intercensal growth rates between 1981 and 1991 for the North-West Region.

Kaokoland and Damaraland Districts cover most of the focus area with a combined surface area of 104750km². This represents 50% of the total North-West Region. The Kaokoland-Damaraland Districts have a total population of 59162 persons (1991 census) which represents a population density of 0.56 persons per km². Compared to the National average of 1.71 persons per km² this is one of the most sparsely populated areas in Namibia.

**TABLE 2.2: INTERCENSAL GROWTH RATES AND POPULATION DENSITY BY DISTRICT**

<table>
<thead>
<tr>
<th>DISTRICT</th>
<th>AREA (km²)</th>
<th>INTERCENSAL GROWTH RATE</th>
<th>POPULATION DENSITY</th>
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<td>5.8</td>
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<td>Kaokoland</td>
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<td>4.5</td>
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<tr>
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<td>602</td>
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<tr>
<td>Walvis Bay</td>
<td>1124</td>
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<td>3.3</td>
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<tr>
<td>TOTAL: NORTH</td>
<td>210948</td>
<td>1.6</td>
<td>3.1</td>
</tr>
<tr>
<td>WEST</td>
<td></td>
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</table>

The sheer size of the population and average densities, however, does not provide the full picture. A review of population density, broken down by enumeration area, provides more detailed information on the population distribution in the area. Map No 202 shows the population density in the North West by enumeration area.

High densities of more than 15 persons per km² are noticeable in the northern parts of the Ombalantu, Oshana and Omuhaka Regions. These high densities only occur in the Urban Centres in the North-West Region such as Swakopmund, Usakos, Sesfontein
and Opuwo. Densities within the North-West Region are generally lower, with the largest part of the Region having a population density of less than 0.49 persons per km². Higher densities occur in the eastern parts of the Region (1 to 2.9 persons per km²). It is also noticeable that the higher densities also occur to the east of the 150mm rainfall isohete.

### 2.3 POPULATION PROJECTIONS

Population growth is the highest in the Kaokoland District (4.5%). Population growth with its associated activities was identified as one of the possible threats to tourism development in the focus area. The focus area is communal land and thus development and movement of people are to a great extent uncontrolled. Population growth in the Region will invariably put higher pressure on the fragile environment and wildlife in the area. As wild game move freely in the area, higher population density in the future would have detrimental effects – unless properly controlled.

For future tourism planning in the area, the future population growth has to be considered and measures should be taken to control high population densities in sensitive and wildlife areas. Using the intercensal population growth rate (1981 to 1991), one could see that population will nearly double within the next 15 years. Figure 2.1 indicates the population growth projections by district and the study area until the year 2015. The population figures for 1970, 1981 and 1991 are those of previous censuses. Generally it could be said that the population in the study area or any district within the area will double within the next 15 to 20 years.

Population density is a function of the size of the population and the area it occupies. It is a valuable indicator to show areas of concentration and possible environmental pressure. However, many other variables such as the carrying capacity of the land, natural resources dependency and climatic conditions are interrelated with population density in determining environmental pressure and sustainability.

### 2.4 LITERACY

The adult literacy rate and the school enrolment rate are two measures of educational system performance. These two measures form part of the Namibia Human Development Index calculated by the UNDP on an annual basis.

The adult literacy rate refers to the proportion of the population above the age of 15 who have completed at least 4 years of schooling. Using this definition the combined literacy rate for Namibia is 86%. This figure, however, conceals great regional variations.
FIGURE 2.1: POPULATION PROJECTIONS BY DISTRICT

<table>
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<td>OMARURU</td>
<td>5304</td>
<td>5498</td>
<td>7446</td>
<td>8380</td>
<td>9715</td>
<td>11262</td>
<td>13056</td>
<td>15136</td>
</tr>
<tr>
<td>DAMARALAND</td>
<td>12632</td>
<td>24214</td>
<td>32986</td>
<td>37126</td>
<td>43039</td>
<td>49894</td>
<td>57841</td>
<td>67053</td>
</tr>
<tr>
<td>OUTJO</td>
<td>13495</td>
<td>8866</td>
<td>12573</td>
<td>14427</td>
<td>17135</td>
<td>20351</td>
<td>24171</td>
<td>28708</td>
</tr>
<tr>
<td>KAOKOLAND</td>
<td>12773</td>
<td>16637</td>
<td>26176</td>
<td>31215</td>
<td>38900</td>
<td>48476</td>
<td>60410</td>
<td>75282</td>
</tr>
<tr>
<td>SWAKOPMUND</td>
<td>25796</td>
<td>15473</td>
<td>20593</td>
<td>22998</td>
<td>26403</td>
<td>30312</td>
<td>34800</td>
<td>39953</td>
</tr>
<tr>
<td>WALVIS BAY</td>
<td>23513</td>
<td>22000</td>
<td>30452</td>
<td>34675</td>
<td>40786</td>
<td>47975</td>
<td>56431</td>
<td>66377</td>
</tr>
<tr>
<td>TOTAL</td>
<td>31177</td>
<td>18144</td>
<td>33122</td>
<td>40616</td>
<td>49407</td>
<td>59549</td>
<td>72210</td>
<td>84371</td>
</tr>
</tbody>
</table>

**KARIBIB DISTRICT POPULATION GROWTH PROJECTIONS**

**OMARURU DISTRICT POPULATION GROWTH PROJECTIONS**

**DAMARALAND DISTRICT POPULATION GROWTH PROJECTIONS**

**OUTJO DISTRICT POPULATION GROWTH PROJECTIONS**

**KAOKOLAND DISTRICT POPULATION GROWTH PROJECTIONS**

**SWAKOPMUND DISTRICT POPULATION GROWTH PROJECTIONS**

**WALVIS BAY DISTRICT POPULATION PROJECTIONS**

**POPULATION PROJECTIONS FOR STUDY AREA**
Table 2.3 shows the literacy rate and school enrolment rates for Namibia’s 13 regions.

TABLE 2.3: ADULT LITERACY AND SCHOOL ENROLMENT BY REGION

<table>
<thead>
<tr>
<th>REGION</th>
<th>ADULT LITERACY RATE %</th>
<th>SCHOOL ENROLMENT RATE %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erongo</td>
<td>81</td>
<td>109.3</td>
</tr>
<tr>
<td>Hardap</td>
<td>71</td>
<td>88.8</td>
</tr>
<tr>
<td>Karas</td>
<td>82</td>
<td>78.9</td>
</tr>
<tr>
<td>Khomas</td>
<td>84</td>
<td>75.6</td>
</tr>
<tr>
<td>Caprivi</td>
<td>75</td>
<td>95.3</td>
</tr>
<tr>
<td>Kunene</td>
<td>45</td>
<td>66.8</td>
</tr>
<tr>
<td>Ohangwena</td>
<td>51</td>
<td>96.5</td>
</tr>
<tr>
<td>Okavango</td>
<td>55</td>
<td>103</td>
</tr>
<tr>
<td>Omaheke</td>
<td>48</td>
<td>77.5</td>
</tr>
<tr>
<td>Omusati</td>
<td>68</td>
<td>103.8</td>
</tr>
<tr>
<td>Oshana</td>
<td>70</td>
<td>84.8</td>
</tr>
<tr>
<td>Oshikoto</td>
<td>61</td>
<td>90.5</td>
</tr>
<tr>
<td>Otjozondjupa</td>
<td>58</td>
<td>77.8</td>
</tr>
<tr>
<td>NAMIBIA</td>
<td>66</td>
<td>91</td>
</tr>
</tbody>
</table>

Source: Namibia Human Development Report 1997

The literacy rate for the Kunene Region is the lowest in Namibia (45%) whereas the literacy rate in Erongo is the third highest in Namibia. History has a strong influence on the literacy rate. The unequal access and lack of facilities in the northern regions in the past explain why young adults were not able to attend school ten or fifteen years ago. This affected the current rate of adult literacy in Kunene region.

The impressive enrolment performance today is a direct result of the post independence drive to achieve education for all. In Erongo the enrolment rate is higher than 100%, as children younger and older than the school going age attend school simultaneously. Kunene Region on the other hand, has the lowest enrolment rate in Namibia (66.8%). This is probably due to the remoteness and lack of infrastructure in the Region.

2.5 INFANT MORTALITY RATE AND LIFE EXPECTANCIES

The infant mortality rate reflects the number of newborn children who die during the first year of life per 1000 births. The average infant mortality rate (IMR) for Namibia is 67/1000 live births. Erongo and Kunene Regions have relatively moderate infant mortality rates below 60/1000 live births. Okavango and Caprivi Regions have the highest IMR of 84 and 106 respectively.
The patterns of life expectancy at birth show exactly the same characteristics as infant mortality with the highest life expectancies occurring in those regions where infant mortality is the lowest. The life expectancies in Erongo and Kunene are of the highest in Namibia. Table 2.4 provides an estimate of life expectancies by region and sex.

**TABLE 2.4: LIFE EXPECTANCIES BY REGION AND SEX**

<table>
<thead>
<tr>
<th>REGION</th>
<th>MALES</th>
<th>FEMALES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erongo</td>
<td>62.7</td>
<td>66.5</td>
</tr>
<tr>
<td>Kunene</td>
<td>60.7</td>
<td>64.5</td>
</tr>
<tr>
<td>Caprivi</td>
<td>51.4</td>
<td>54.5</td>
</tr>
<tr>
<td>Okavango</td>
<td>55.5</td>
<td>59</td>
</tr>
<tr>
<td>Omaheke</td>
<td>56.7</td>
<td>60.3</td>
</tr>
<tr>
<td>Hardap</td>
<td>57.9</td>
<td>61.5</td>
</tr>
<tr>
<td>Karas</td>
<td>58.4</td>
<td>62</td>
</tr>
<tr>
<td>Otjozondjupa</td>
<td>59</td>
<td>62.6</td>
</tr>
<tr>
<td>Oshikoto</td>
<td>59.3</td>
<td>63</td>
</tr>
<tr>
<td>Oshana</td>
<td>60.3</td>
<td>64</td>
</tr>
<tr>
<td>Okangwena</td>
<td>60.9</td>
<td>64.6</td>
</tr>
<tr>
<td>Omusati</td>
<td>63</td>
<td>66.9</td>
</tr>
<tr>
<td>Khomas</td>
<td>65.5</td>
<td>69.5</td>
</tr>
<tr>
<td>Namibia</td>
<td>59.1</td>
<td>62.8</td>
</tr>
</tbody>
</table>

### 2.6 SEX AND AGE STRUCTURE

Figure 2.2 gives an indication of the age and sex distribution of population in the Erongo and Kunene Regions. In Erongo the pyramid has an uneven shape up to the group of 40-44 years, after which it assumes a normal shape similar to the national population distribution. The anomaly in the age groups 20-30 (males) indicates that an influx of young men from elsewhere, looking for job opportunities, is experienced. The dependency age group (0-19 years) account for a low 41% compared to the national average of 53.2% and the productive group of 20-24 years represents 58.3% compared to the national average of 48.5%.

Approximately 63% of the people in the Erongo region are urbanised and live in the urban areas of Swakopmund, Omaruru, Karibib, Arandis, Usakos, Uls, Henties Bay and Walvis Bay.

The population pyramid for the Kunene Region has a fairly wide base with 48.7 of the population falling in the 0-19 years or dependency age group and 51.1% in the productive group of 20-64 years. The Kunene population pyramid compares favourably
with the national population structure. This indicates that most of the people stay in the region and do not migrate to take up employment elsewhere.

Only 14% of the people in the Kunene Region are urbanised and live in towns like Otji, Khorixas, Opwo and Kamanjab.

2.7 EMPLOYMENT

The means people use to make a living has a strong relationship with the national environment. Given the aridity and sensitivity of the natural environment in the North-West, the growth of the labour force and the labour market provide important clues to the extent to which people are likely to be dependant on natural resources. It also indicates the likelihood that the labour market will be able to assist in lessening dependence on natural resources.

Labour Force: The labour force may be defined as the number of people who are economically active together with those who are not active but are looking for employment.

The labour force participation rate is calculated from the economically active population as a percentage of the working age population. The working age population could be defined as all people aged 15 and older.

**TABLE 2.5: INDICATES THE LABOUR FORCE PARTICIPATION RATES FOR KUNENE AND ERONGO REGIONS.**

<table>
<thead>
<tr>
<th>REGION</th>
<th>BOTH SEXES</th>
<th>MALE</th>
<th>FEMALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erongo</td>
<td>55.4</td>
<td>69.2</td>
<td>40.0</td>
</tr>
<tr>
<td>Kunene</td>
<td>56.6</td>
<td>67.2</td>
<td>45.7</td>
</tr>
<tr>
<td>Namibia</td>
<td>58%</td>
<td>69</td>
<td>49</td>
</tr>
</tbody>
</table>


Erongo Region has the third highest labour force participation rate in Namibia (55.4). Participation rates for males in Namibia are generally higher than those for females. The gap between males and females is smaller in the northern regions where communal land exists, one reason being that unpaid family workers are common in the communal areas. (See Table 2.5)

Economic Activity: The level of participation in the labour force needs to be supplemented with information on the type of economic activity in which the people are involved so as to establish the level of dependency on the use of natural resources. A good indicator of the extent to which people are directly dependent on natural resources
is the proportion of the population employed directly in agriculture, hunting, forestry, fishing and mining.

Table 2.6 indicates the percentage of people employed in the primary sector in the Kunene and Erongo.

**TABLE 2.6: PERCENTAGE OF PEOPLE EMPLOYED IN PRIMARY SECTOR**

<table>
<thead>
<tr>
<th>REGION</th>
<th>% of total employed in agriculture, hunting, forestry, fishing</th>
<th>% of total employed in mining and quarrying</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERONGO</td>
<td>19.85</td>
<td>14.00</td>
<td>33.85</td>
</tr>
<tr>
<td>KUNENE</td>
<td>64.90</td>
<td>0.5</td>
<td>65.40</td>
</tr>
</tbody>
</table>

People employed in the primary sector in Erongo (33.85) is the second lowest in Namibia. It is only Khomas with a lower level of 7.70%. The Kunene Region on the other hand has a relatively high level of people working in the primary sector. This is probably due to the few urban centres in the area and large communal undeveloped land.

**Unemployment:** Unemployment is one of the main causes of poverty. In 1991 it was found that 99239 people out of the economically active population of 493580, were unemployed. This means that 20% of the economically active population was unemployed in 1991.

Table 2.7 indicates the unemployment rate by sex and region

**TABLE 2.7: UNEMPLOYMENT BY SEX AND REGION**

<table>
<thead>
<tr>
<th>REGION</th>
<th>BOTH SEX</th>
<th>MALE</th>
<th>FEMALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERONGO</td>
<td>24.5</td>
<td>19-4</td>
<td>34-6</td>
</tr>
<tr>
<td>KUNENE</td>
<td>18.9</td>
<td>14-19</td>
<td>25-0</td>
</tr>
</tbody>
</table>

Erongo has the third highest unemployment rate in Namibia whereas Kunene has the fourth lowest unemployment rate in Namibia. It is noticeable in the 1991 census figures that unemployment is generally higher in the commercial areas than in the communal areas. The higher levels of unemployment in the Erongo Region could be attributed to the large commercial centres of Walvis Bay, Swakopmund, Usakos, Henties Bay, etc. The lower unemployment rates in communal areas are inter alia due to economically active people migrating to urban areas. However, the population pyramids for the
Kunene Region indicates that most of the economic active population in this region remains in the region.

2.8 CONCLUSION

- Although the North-West Region is sparsely populated on average, high population concentrations exist to the east of the Region (east of the 150mm rainfall isohete). High densities, together with high rates of dependency on agriculture and the climatic and rainfall variability found in this area, have resulted in a situation where some areas, especially the north eastern part of Kunene, are under pressure due to unsustainable use of natural resources.

- High population growth figures in especially the Kunene Region, will place more pressure on the sensitive environment. High employment figures in the agriculture sector may further increase environmental pressure. Tourism planning on local level (conservancy level) will have to address and accommodate agricultural activities and high population growth over the medium and long term.

- Unemployment levels in the Kunene Region are high and would probably follow the national trend of increasing unemployment rates. Unemployment will increase over the medium and long term as a result of the current milieu of negative real economic growth.

- The low adult literacy rate in the Kunene Region is a matter of concern. Economic diversification is difficult to achieve with a labour force having such low skills levels.

- Unemployment rates in Erongo are alarmingly high. Rising levels of unemployment represent a danger signal for sustainability. Although the high levels of unemployment in Erongo are probably due to the presence of the large commercial centres, it should be noted that unemployment leaves in its wake vulnerability and poverty and implies more pressure on the natural resource base as a last resort for survival.
3. URBANISATION AND INFRASTRUCTURE

3.1 INTRODUCTION

Urbanisation in Africa is taking place rapidly. People are moving to the cities for various reasons, however, the most common being to seek better employment opportunities.

The world's urban population has risen from 28% in 1950 to 40% in 1980 and it is expected to increase to 60% in 2000.

The urban population in Namibia rose from 22.7% in 1970 to 26.5% in 1981 and to 32% in 1991.

The process of urbanisation normally follows a typical pattern of a starting phase characterised by a gradual increase. Once 30% of the population reside in urban areas, acceleration in the rate of urbanisation can be expected. This increase continues until about 70% of the population reside in urban areas whereafter a decrease and stabilisation in urbanisation could be expected.

3.2 SPATIAL STRUCTURE

The only two Part 1 municipalities in the north-west region are Swakopmund and Walvis Bay, both being located in the Erongo Region. Other larger towns in the North-West region are Omaruru, Usakos, Karibib, Henties Bay, Arandis, Outjo, Khorixas, Opuwo and Kamanjab. Opuwo and Khorixas are the only two towns located within the communal area or "focus area". However, both these towns are proclaimed townships. (See Map No 301) Smaller settlements such as Uis and Sesfontein play an important role in the urban structure due to its strategic location. Both these settlements are prominent economic centres in the tourism industry.

Although very low in total population, more than 300 small settlements are located in the traditional communal land of the North-West region. These settlements situated in the Omajete-Okambahe area and in the whole of Kaokoland can be seen on Map No 301. Although some of these settlements are only a few households in size, population growth in these settlements may hold a threat to future tourism development. Increased population density in these settlements may occur with government's policy to provide more bulk water and electricity to the rural areas.

It is noticeable that fewer settlements exist in the area north of the Ugab river and south of Sesfontein. This is also the area with considerable numbers of the wildlife. More
settlements and higher densities north and especially north-east of Sesfontein, up to the Kunene River are accompanied by lower numbers of wildlife.

3.3 URBANISATION

The Erongo Region has one of the highest urbanisation levels in Namibia (63%). This may be the result of the large urban centres of Walvis Bay, Swakopmund, Arandis and Henties Bay providing employment opportunities. The Kunene region, on the other hand has a moderate to low urbanisation rate (25%). Other than the Erongo Region, the Kunene is poorly provided with large urban centres. The relatively small towns such as Opuwo, Khorixas, Kamanjab and Outjo are not rich in economic activities and do not attract people from the rural areas.

The urban population for towns and villages in the Kunene and Erongo Regions increased between 1981 and 1991 with 5.3% and 4.84% respectively, per year, compares to the population growth of 3% per year for the total of Namibia.

High levels of urban growth compared to very low levels of rural growth (Karibib District 1.01% and Omaruru District 0.30%), indicates that most of the future population growth will be urbanised.

Ad hoc planning of infrastructure and social services by different Ministries may lead to negative urbanisation. Line ministries are trying to implement policies of decentralisation but to a large extent uncoordinated on a regional or national level. Planned urbanisation will have positive results in the north-west, especially in the communal areas with scattered small settlements. The North-West region, as well as on a national level, urgently needs an urbanisation policy to guide the process of urbanisation. The government policy of decentralisation makes this a more important policy.

Controlled or co-ordinated urbanisation and decentralisation are particularly important for tourism development in the north-west.

3.4 WATER SUPPLY

Bulk water supply as well as rural water supply in the North-West Region and in Namibia, is the responsibility of the Ministry of Agriculture, Water and Rural Development, Department of Water Affairs. Rural water supply is mainly limited to communal areas, commercial farmers have to provide their own water infrastructure.

Extensive bulk water supply in the north-west is mainly limited to the large urban centres of Walvis Bay Swakopmund, Henties Bay, Usakos, Uis, Khorixas and Khorixas
and Opuwo. Map No 302 clearly indicates the lack of bulk water supply to the Kunene region. However, many boreholes in the region have been drilled and equipped by the government and private organisations. Nearly all the small settlements in the communal area in both regions are located in close proximity to an existing borehole. The availability of water in these regions, and especially in the Kunene Region, has a determining effect on the location and establishment of settlements.

The natural water resources are discussed in more detail in chapter 8 of this report.

3.5 ELECTRICITY

The two main sources of electricity in Namibia are Ruacana hydroelectric power station (240mw) and the coal fired Van Eck Power Station at Windhoek (191mw).

As is the case with bulk water supply, bulk electricity supply in the north-west is limited to the large commercial centres. The Erongo Region is reasonably well provided with power lines, however, this cannot be said for the Kunene Region. The communal areas of the “focus area” are poorly covered by electricity. (See Map No 303)

As indicated on Map No 303 the main 330 kV power line Ruacana to Omburu runs through the Kunene Region. However, no power is tapped from this line except for Opuwo who benefited from this line since 1991. Opuwo is connected to Ruacana through a 66 kV line.

Other places in the Kunene Region served by Nampower include Khorixas and vicinity through a 66 kV line from Otjikopos. 11 kV lines serve a number of commercial farms in the Outjo district. As mentioned, four lines are provided in the communal area. Erwee has recently been provided with electricity from Nampower.

The electricity network in the Erongo Region is reasonably good, however, mostly limited to the commercial areas. The electricity network in the region consists of a 220 kV line from the distribution centres Omburu and Walmond. The distribution centre Walmond serves Swakopmund and Walvis Bay (66 kV). Another 66kV line from Omburu serves Okambane and Uis. Henties Bay also receives electricity via a 66kV line from the Khan Substation. The rest of the larger towns receive electricity via 22 kV lines.

Smaller settlements such as Sesfontein and Purros have no electricity. Hotels, guest farms and businesses have to make provision for their own source of electricity.

Nampower has recently appointed a local consulting firm to investigate the provision of on-grid and off-grid electricity provision to rural areas. The Kunene and Erongo communal area is part of this investigation. Although this study and effort by Nampower
are being appreciated, this also takes place without considering long term planning by other line ministries. The provision of electricity to remote areas in the Kunene might affect tourism development in the area.

3.6 COMMUNICATION

Nampost and Telecom are responsible for the provision of postal and telecommunication services in the north-west. Telecommunication services are well provided in the commercial areas, such as Swakopmund, Usakos, Walvis bay, Outjo and Henties Bay. However most of the focus area or communal land is poorly provided with telecommunication services.

The only places with telecom services within the focus area are Opuwo, Anker, Khorixas, Sorris Sorris, Uis, Okombahe and Arandis. Some of these places such as Sorris Sorris still use the magneto ring down circuit.

The largest part of the north-west, west of Opuwo and Khorixas and from the Kunene river in the north to the Spitzkoppe in the south has no telecommunication service. A settlement such as Sesfontein, which plays an important role in tourism development has no service and has to make use of radio communication.

Since Telecom Namibia is a semi-private organisation, services, however are provided according to business principles. Investments or improvements must be financially justified.

3.7 TRANSPORT

Although one of the most remote areas in Namibia, the study area is fairly well provided with infrastructure. However, some of the areas are only accessible by 4x4.

3.7.1 ROADS

Road infrastructure in the Erongo Region could be described as well provided and in good condition. The national road network runs from Walvis Bay to Okahandja and another tarred road links up with this road at Karibib from Omaruru. A high order gravel road links Khorixas with Omaruru and Henties Bay with Uis. Two other important gravel roads link Swakopmund and Walvis Bay with important tourism destinations such as Windhoek and Sossusvlei. These roads, and especially the gravel road between Walvis Bay and Sossusvlei, play an important role in the tourism infrastructure and movement in these regions.
Tarred roads in the Kunene Region are mostly restricted to the commercial areas. Tarred roads in this region extend from Outjo to Otjiwarongo, Kamanjab, Khorixas and Okaukuejo. Only one main gravel road runs through the most eastern part of the region from Khorixas to Ruacana. The majority of this area is only accessible by district gravel roads. Although the standard of these roads has improved a lot over the past few years, it is recommended that a 4x4 vehicle be used on most of the roads. The most popular 2x4 and 4x4 routes are indicated on Map No 604 included in chapter 6 of this report.

In general it could be said that roads in the focus area are limited to gravel roads and that accessibility becomes more difficult in the areas north of Sesfontein.

The only improvements or upgrading of roads envisaged by the Ministry of Transport and Communication, within the next four years, are District Road 3700 between Ruacana and Epupa Falls. The other road earmarked for upgrading is District Road 3703 extending from Okankwali to Etanga via Otjitanda. The upgrading of these roads will make the northern parts of the Kunene, such as the Van Zyl’s pass, more accessible to tourists. The upgrading of the Ruacana-Epupa road will also allow a much more convenient “circle route” through the northern regions of Namibia. This road is, at this stage, totally inaccessible to any 2x4 vehicle.

3.7.2 AIRPORTS AND LANDING STRIPS

The only airports within the study area, which are included in the regular Air Namibia schedules, are at Walvis Bay and Swakopmund. Both of these airports are situated in commercial centres in the Erongo Region. Other airstrips that can be used by small aircraft are situated at Henties bay, Usakos, Uis, Outjo, Kamanjab, Khorixas and Opuwo. However, a number of private landing strips are located in the study area. These are mainly to serve privately owned lodges and are aimed at serving the tourist market. (Refer to Map 304)

3.7.3 RAILWAY LINE

No railway line exists to serve towns located within the focus area. However, two railway lines are located within the study area, serving some of the commercial centres.

One railway line exists between Windhoek and Walvis Bay, via Karibib, Usakos and Swakopmund. Another railway line exists between Usakos and Outjo via Omaruru and Kalkfeld. These are the only lines within the study area.
4. EXISTING LEGISLATION AND POLICY: TOURISM AND THE ENVIRONMENT

4.1 INTRODUCTION

This chapter serves to highlight existing legislation and policy affecting tourism and the environment in the study area.

The basis for all legislation in Namibia is the Constitution of the Republic of Namibia. Article 95 states:

'the State shall actively promote and maintain the welfare of the people by adopting ... policies aimed at ... maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilisation of living natural resources on a sustainable basis for the benefit of Namibians, both present and future ...'

This article is the guiding principle but not enforceable by law. A variety of legislation, old, new and in the process of being promulgated supports the sustainable use of Namibia's resources and is applicable in the study area (Jacobson et al., 1995, Water and Environment Team, 1999).

4.2 NATURE CONSERVATION ORDINANCE NO 4 OF 1975

The Nature Conservation Ordinance No 4 of 1975 affords protection to various categories of plants as animals, as well as wetlands located within National Parks. This legislation has been amended to enable the development of conservancies in rural areas of Namibia which should contribute to improved management of rural water sources for tourism and wildlife, although in this legislation communities have no control over rangeland or water sources per se. The Ordinance and its amendments are primarily focused on control of consumptive uses and make few provisions for protection of wildlife habitat upon which tourism in the study area depends.

4.3 ENVIRONMENTAL MANAGEMENT ACT (X 1998)

The draft Environmental Management Act provides for a set of environmental management principles to be applied by all Government institutions and private persons in planning and implementing developments likely to have a significant effect on the environment and further gives legislative effect to the Cabinet Policy of Environmental Assessments in Namibia. In terms of this proposed legislation, environmental impact assessments will be required in respect of all plans, policies or programmes which may
have a significant effect on the environment and all activities listed in schedule 1 to the proposed legislation. Tourism developments would be regulated by this act.

Noteworthy in this Act is Schedule 1, a list of activities requiring environmental assessment. Included under this section are:

- The erection and construction of tourism facilities and associated structures
- The drilling of boreholes and the construction of dams, reservoirs, levees and weirs
- The construction of upgrading of airports, airfields and associated structures

4.4 DRAFT TOURISM ACT (MARCH 1998)

In accordance with the White Paper on Tourism, the draft Tourism Act will be completed and promulgated at some stage in the future. At this point, the draft act is not being worked on although the national CBNRM programme is motivating for the draft to be completed and promulgated.

The overall objective of the draft act is:

"To make provision for the orderly, co-ordinated and harmonious development of the tourism industry; to ensure that benefits accruing from the industry are distributed over a broad range of beneficiaries; that tourism development ensures that previously neglected areas of the country receive priority treatment; to establish policy guidelines for the tourism industry; to spell out the powers of the Minister; to provide for the creation of tourism development plans and priority tourism zones and structures to manage them and matters incidental thereto."

This document contains the draft tourism policy for Namibia. The main role of the policy is to:

- Define and clarify roles and responsibilities amongst stakeholders
- Adopt a strategic approach to dealing with the prerequisites for success, key constraints and major opportunities for development.

The draft legislation provides:

- A national Tourism Policy
- Clarification on the general functions of the Minister
- Regulation of tourism development, operation and activities
- National Tourism Development plans
- Regional Tourism Development plan
- Declaration and management of priority tourism zones
• Tourism concessions, application, granting concession and rights of conservancies in respect of tourism concessions

Special note should be made of Section 10, which states:

"A conservancy committee shall upon declaration by the minister of its area as a conservancy under the nature Conservation Ordinance 1975 (4 of 1975) as amended in addition to any rights and obligations which may accrue to it under that law, acquire all rights to operate or lease tourism concessions within the conservancy, for the benefit of the members of the conservancy."

4.5 WILDLIFE MANAGEMENT, UTILISATION AND TOURISM IN COMMUNAL AREAS (JUNE 1995)

This was approved by Cabinet and gazetted in June 1996 (legislation requirements in November 1996). This provides the foundation of the Namibian Communal Area Conservancies Programme. This legislation is implemented through the establishment of either Wildlife Councils or conservancies.

This legislation allows for new and increased responsibilities, rights and benefits over wildlife to communal area inhabitants who constitute themselves as conservancies. Conservancies have legal status through a representative committee and its constitution. Such legal status is awarded by the MET once the duly constituted committee has fulfilled a series of requirements.

"A conservancy consists of a community or group of communities within a defined geographical area who jointly manage, conserve, utilise and benefit from the wildlife and other natural resources in the area."

Conservancies can benefit financially through the consumptive and non-consumptive use of wildlife. This includes entering into joint-venture type agreements with commercial/formal sector tourism operations. Benefits generated are managed by the conservancy committee and distributed according to the conservancy's own equitable benefits distribution plan.

As well as addressing the discriminatory provision of the Nature Conservation Ordinance of 1975, the Government hopes to provide incentive for improved management and conservation of wildlife and other natural resources through this legislation.
4.6 COMMUNITY BASED TOURISM POLICY (JUNE 1995)

In addition to the Communal Area Conservancy Legislation, this document outlines the MET policy in support of communities on communal land to have both access to tourism opportunities and a share in the benefits generated by tourism in their areas.

It is MET policy to ensure that:

- People can benefit from tourism and participate in tourism planning
- People will be encouraged to develop tourism enterprises. Incentives will be created to enable people to benefit from tourism on their land and to conserve wildlife and natural resource
- Development on communal land must be acceptable to the people
- Established tourism businesses are encouraged to work with people in communal areas
- Tourism development will work hand in hand with conservation of the environment

This policy is grounded in the following guiding principles:

“3.1 The needs and aspiration of rural communities, local people and the informal sector must be pro-actively incorporated into Tourism legislation regulations”
People must be consulted and their ideas included in tourism planning and legislation

“3.2 Tourism regulations and legislation must avoid prescribing forms of involvement in tourism by rural communities, local people and the formal sector, and rather create a supportive and enabling legal framework.”
Legislation should assist and support tourism development

“3.3 The MET and tourism industry should work actively to increase the representation of the informal tourism sector and community interests in existing and future tourism fora.”
The informal tourism sector should be organised and recognised as representing community interest

“3.4 Private sector tourism enterprises on communal land should involve and benefit local residents, and provide incentives for conservation to those that bear the costs of wildlife and tourism, to the maximum extent possible within financial and institutional constraints.”
Large businesses operating on communal land should involve and benefit local residents, who often gain little from wildlife and tourism on their land
In section 4.2 "Prioritise community interests in planning" of this document, special provision is made for the consultation of the community in regard to PTO and tourism concession applications. Such participation will be one of the criteria used by the MET to decide on recommending the application.

This document also makes specific reference to some of the roles and functions of the MET Community Based Tourism Officer who will, "...facilitate communication within the informal sector and among the informal sector, government, investors, tourism companies etc., and ensure that community-based tourism is given appropriate recognition in further national tourism policy development".

4.7 COMMUNAL LAND REFORM ACT 2000

Communal land belongs to the State. The State holds communal land in trust for the benefit of the traditional communities residing in those areas and for the purpose of promoting the economic and social development of the people of Namibia.

The purpose of this Act is to provide for the allocation of land rights in the communal areas, to establish communal land boards and to describe the powers of Chiefs and Traditional Authorities that will be affected thereby. The National Land Policy provides that "tenure rights" allocated according to this policy and subsequent legislation will include all renewable natural resources on the land, subject to sustainable utilisation and the details of sectoral policy and legislation.

The Board will consist of:

- a representative of each of the Traditional Authorities in the area
- one representative from the organised farming community
- a regional officer of the Regional Council concerned
- two women engaged in farming operations
- two women who have experience in the functioning of a board
- One member from each of the following ministries, MLRR, MLRGH and MET and;
- One member from a conservancy.

The Communal land Board Must:

- Exercise control over the allocation and cancellation of customary land rights by Chiefs or Traditional Authorities
- Consider and decide applications for a right of leasehold
- To establish and keep registers for the allocation, transfer and cancellation of customary land rights and rights of leasehold
- To advise the Minister on matters relating to the objectives of the Act.
When granting leasehold rights within a conservancy the management and utilisation plan of the conservancy committee should be considered. The right of leasehold must be in accordance with the management plan of the conservancy.

4.8 WATER ACT NO. 54 OF 1956

The Water Act No. 54 of 1956 currently protects Namibia's water resources. The act covers a wide range of issues relating to protection of surface and subsurface waters from pollution and misappropriation. A major limitation of the Act, however, is that it does not specifically recognise downstream environments or an ecological reserve, upon which the livelihoods of many Namibians depend. If applied, however, the law could, in principle, be used to maintain downstream flow for environmental needs. As ephemeral rivers and their episodic flow are so important for the northwest, this latter possibility could be important but has not, to date, be invoked.

4.9 SOIL CONSERVATION ACT NO 76 OF 1969

The Soil Conservation Act No 76 of 1969 makes provision for controlling and preventing soil erosion and for the conservation and protection and improvement of the soil, vegetation and sources and resources of the nation's water supplies. This Act gives broad powers to the State but is not applicable in communal farmlands, a land tenure system that occupies most of the study area.

4.10 MINERALS PROSPECTING AND MINING ACT NO 33 OF 1992

The Minerals Prospecting and Mining Act No 33 of 1992 has several references to adequate protection of the environment. It is of relevance to the northwest as there is potential for mining in the study area.

4.11 DRAFT FORESTRY ACT

The Forest Act No 72 of 1968 and the Preservation of Trees and Forests Ordinance No 37 of 1952 are about to be superseded by the new draft Forestry Act. This new act will afford protection to 'any living tree, bush or shrub within 100m of any river, stream or water-course' which will protect riverine vegetation and in turn, conserve the soil and water. In theory this is intended to include the protection of the water source, so as to conserve the riverine vegetation. In practice the position could be very different, particularly in ephemeral rivers, as witnessed by the situation where river sand, not covered by the Act, is removed from ephemeral river beds leaving huge trees growing from islands of soil high above the excavation. It is not clear how this Act would protect riverine vegetation from alteration of the river course or water flow and whether this Act could partly address the need for an 'ecological reserve'. Because of
the great importance of the ephemeral rivers and their associated vegetation in the northwest, for wildlife, livestock and people, in particular tourists, this new act could have a major influence on the study area.

4.12 MOUNTAIN CATCHMENT AREAS ACT 63 OF 1970

The Mountain Catchment Areas Act 63 of 1970 is designed to assure the highest possible quality and quantity of water on a dependable basis from the mountainous regions of upper catchment areas. If applied, it could influence development and environmental management in the study area.

4.13 WHITE PAPER ON TOURISM (MARCH 1994)

Approved by Cabinet in March 1994, this document grew out of the Namibia Tourism Development Plan (NTDP) of 1992 (Hoff and Overgaard) This is currently under review and is to be forwarded to Cabinet by the European Union sponsored consultancy programme in June 1999. The white Paper includes the government tourism policy.

One updated, through the addition of new legislation or through changes to existing legislation, this will constitute the overall Tourism Act. Notable is that amongst the legislation to be updated is the communal area conservancy legislation. In particular the revisions should allow for greater clarity in terms of rights, responsibilities and benefits through tourism.

This document is related to and builds on the NTDP to provide a guide, framework and reference for the implementation of the tourism strategy. The document highlights the following:

- Tourism should generate income and employment and that a high portion of benefits generated should remain in the place where the tourism is taking place
- Clear emphasis is laid on the need for planned and controlled tourism development in the country
- The need for a land use policy in regard to the lack of control over tourism outside of National Parks
- The support of such policy through the use of defining land use zones which in turn should be backed by legal status
- Recommends maintaining (through incentive) the link between tourism and sustainable natural resource management
4.14 WETLAND POLICY OF 1994

The Wetland Policy of 1994 of the Ministry of Environment and Tourism encourages the rational and integrated planning of wetland systems based upon the preservation of the biotic diversity, maintenance of the life support systems and sustainable use. A National Wetlands Policy, in line with RAMSAR requirements, is being drafted by the Wetlands Working Group of Namibia.

4.15 NATIONAL DROUGHT POLICY AND STRATEGY

The National Drought Policy and Strategy, approved by Cabinet in 1998, focuses on preparation for and mitigation of effects of drought thereby encouraging the appropriate management and sustainable use of water, particularly those sources developed for and used by livestock. Implementation of this policy and strategy, in conjunction with the Agricultural Policy in the study area would have major positive effects on the state of the environment.

4.16 OTHER RELEVANT LEGISLATION/POLICIES

Other relevant policies and legislation related to tourism activities within the study area in respect to state land/communal areas, commercial farms/freehold area and proclaimed National Parks are listed below.

- Policy for Park Management Plans (August 1993)
- Land Use Planning: Towards Sustainable Development (May 1994)
- Policy for Conservation of Biotic Diversity and Habitat Protection (May 1994)
- Namibia's Environmental Assessment Policy (January 1995)
- Namibian Green Policy
- Proposed policy for Parks and Residents people (October 1997)
• Namibia Wildlife Resorts Act
• Namibia Tourism Bill
• Communal Area Land Bill - this document has been tabled to the Minister of Lands, Resettlement and Rehabilitation for review. This review will take cognisance of the comments made on it by the public. This bill may have important implications for the future of tourism on state owned land, based on provisions made for tenure in these areas, potentially through registered conservancies.

4.17 CONSERVATION AREAS

The entire coast of Namibia in the northwest is provided with some degree of conservation status. The Skeleton Coast Park in Kunene Region in the north and the National West Coast Tourist Recreation Area in Erongo Region the south are both proclaimed under the Nature Conservation Ordinance No 4 of 1975. The Brandberg area is provided some protection under the Monuments Council as are isolated attractions such as the Burnt Mountain, Twyfelfontein rock engravings and all rock shelters of archaeological significance and middens.

4.18 CONCLUSION

At present the MET is preparing a proposed policy framework for wildlife production and utilisation in support of biodiversity, conservation and economic development. This is the basis of the future "Parks and Wildlife Act" which will consolidate and replace all existing legislation. Similarly the work being undertaken on the White Paper for Tourism will encompass all existing legislation and policy related to tourism becoming the overall "Tourism Act".
5. BIOTIC ENVIRONMENT - NORTH-WEST REGION

5.1 INTRODUCTION

This chapter first provides a national perspective on the northwest region from the point of view of the biophysical environment. This perspective is then expanded to describe the environmental patterns in terms of abiotic and biotic components with particular emphasis on wildlife. This sectoral report on the environment concludes with a review of the sensitivity of the environment in relationship to the existing use patterns.

A second component of this chapter includes brief comments on aspects mainly covered in other chapters. This focuses on problems and opportunities associated with land use patterns, tourism attractions and areas with potential for tourism development.

5.2 NATIONAL PERSPECTIVE ON NW REGION – ENVIRONMENTAL VIEWPOINT

From an environmental perspective, the north-western area of Namibia is different from all other areas in Namibia. Its ancient and recent history, its ecology and its current status differ which, in turn, mean that its current overall environment provides a development potential that differs from the potential of the remainder of Namibia (Jacobson et al., 1995). Of all the areas of Namibia, this area is most attractive for tourism from the environmental point of view.

A geological wonderland: Much of Namibia is covered by recent deposits of sand and calcrites, however, the northwest is different. Here much of the land is bare, because the harsh climate limits soil development and vegetation growth. As a result, an ancient landscape is visible on the surface. This landscape tells a story of collisions, fire flood and ice; the story of a landscape shaped by colliding continents, volcanic eruptions, glacial advances and retreats, inundation by seas, break-up of the Gondwanaland super continent, flows of molten lava and, finally, dissection by flowing rivers. This geological wonderland of broken, arid topography is found nowhere else in Namibia.

Thin and poorly developed soils: Soils in the northwest vary in association with the diverse geology and increasing aridity from east to west. Close to the coast, soils consist of either littoral sands including large sand dunes or are salty. Further inland, soils are generally calcareous, thinly overlying a hard rock surface. Only within the flood plains of the westward flowing ephemeral rivers are there thick deposits of sand loams and sandy clay loams. These alluvial soils, when associated with high groundwater tables, often support dense stands of riparian forest of interest to wildlife and people. These are the areas that have some potential for irrigation although they often have poor drainage and are naturally saline. The soils in the northwest differ from
much of Namibia where deep Kalahari sands cover the eastern and northern landscapes, calcrete and thin soils cover the central highlands and southern arid areas and deep sand dunes occupy much of the southern Namib Desert.

Rainfall, evaporation and drought: Rainfall in the north-western area is low and variable ranging, from west to east, between 0 mm up to 300 mm annual mean. Rain may fall between October and May, but mainly in late summer – February – April. Rainfall variability is high and a place like Khorixas, approximately 180 km from the coast, may, with 90% probability, expect rainfall between 22 mm and 500 mm in any one year. On the other hand, mean annual potential evaporation is around 3000 mm. Drought (defined as more than two years with rainfall lower than the long-term mean) is normal in the north-western area of Namibia. From a national perspective, the northwest is as dry as the southern and south-western parts of Namibia. Much of the difference lies in the occurrence of low summer rainfall combined with broken, mountainous topography, predominantly communal land tenure and comparatively high population density.

Catchments, runoff, floods and river flow: Rain in the northwest usually comes in late summer in huge thunderstorms which result in little soil infiltration and much runoff. Throughout the year, numerous small perennial and ephemeral springs support wildlife and, increasingly, livestock throughout the western Kunene Region of the study area. Nevertheless, runoff water causes the flow in the ten large ephemeral rivers (and one perennial river, the Cunene) traversing the northwest and is a prime source of water in the study area. As a consequence of infrequent runoff, life in the northwest focuses on the ephemeral rivers and their catchments, for their water stores and vegetation that support directly, or indirectly, most life in the area. Flood waters recharge the alluvial aquifers and surface wetlands, transport nutrients and rearrange the landscape within these ephemeral rivers. Many small farm dams and several large ones currently impede the ephemeral flows in the longer rivers with the result that water tables are lower than would naturally occur and some perennial wetlands have become ephemeral. The Fish River in southern Namibia is an ephemeral river flowing through a dramatic canyon landscape. The shallow, mainly fossil omarumba of eastern Namibia are also ephemeral. None of these other rivers, however, equal the ephemeral rivers in the northwest for the amount of wildlife, livestock and people they support in scenic grandeur. From a wildlife and tourism point of view, as well as from the point of view of most people living in the study area, rivers are the most important environmental component of the landscape.

Diverse and varied, meagre vegetation: The high vegetation diversity of the northwest is not highlighted in the generalised vegetation maps available. Overall, the northwest falls into the Northern Namib, mopane savanna and semi-desert transition vegetation zones. It is this latter zone where the broken landscape of the escarpment
has contributed to development of highly diverse vegetation with a high degree of endemism. It is only in the winter rainfall southern Namib where a highly diverse and endemic vegetation is also found in Namibia. Most important to the wildlife, domestic livestock and people of this low rainfall area, however, are the grasslands and the riparian vegetation associated with the ephemeral rivers.

**Wildlife in the north-west:** Large vertebrates survive in the more arid, western portions of the north-west by being nomadic. Springs and wetlands are essential watering points to the mega-fauna found here and in few places elsewhere in Namibia outside of reserves. The populations of rhino, elephant, lion, giraffe and other wildlife within this area are unique in the world. Nowhere else does one find such a diverse assemblage of wildlife in such a dry landscape. At the same time, nowhere else in Namibia does game exist in such a spectacular and varied topography. Moreover, the dissected escarpment of the northwest harbours a diverse, endemic fauna of birds, reptiles and invertebrates with a number of species found nowhere else in Namibia.

**Nomads in a variable environment:** Lives of people living in the northwest are also guided by the rough landscape, variable rainfall and arid climate. In times gone by, people probably occupied the area when rains were good and moved elsewhere, or at least to the rivers, when dry times occurred. Today people still move their herds of livestock over large distances to the vegetation and water provided by the ephemeral rivers when rains fail. Others live permanently along ephemeral rivers and tap the alluvial groundwater and use the riparian vegetation to support themselves and their livestock. Elsewhere, boreholes constructed to tap the groundwater have resulted in the establishment of permanent settlements where none existed in the past. Nowhere else in Namibia do people live in such a dramatic, variable environment, in the presence of wildlife, at great distances from larger settlements and with such unique opportunities for development. It remains to be seen if these opportunities will be realised.

**Spectacular landscape:** The above components of the natural, biophysical environment are combined in the study area to offer a varied, spectacular landscape. Mountainous areas, broad expanses of sometimes grassy plains and coastal sand plains and dunes are all elements of this landscape. This varied and spectacular landscape provides the habitats that support the diverse biota of the study area.

From an environmental perspective, the northwest of Namibia presents a spectacular, mountainous landscape, a variable climate, limited sources of water, and a diverse vegetation and animal fauna (Annexure from Table 2.2, page 75, biodiversity study). Together, these attributes offer the potential for a rich and varied course of development or can be interpreted as an inhospitable landscape to be conquered and subdued. From the national perspective, there is much to be gained by appropriate and sensitive
development of this unique region. The environmental attributes present the stage, however, people must make the decisions as to the play to be performed.

5.3 ENVIRONMENTAL PATTERNS AND DESCRIPTION

For this section, the environmental patterns and their description are categorised as the abiotic environment, the vegetation and the wildlife. Although this section refers to the status quo, the emphasis on wildlife in the development of this region, particularly for tourism, has led to this section receiving the most attention.

5.3.1 ABIOTIC ENVIRONMENT

5.3.1.1 Climate

Most rain that falls on Namibia has its origin over the Indian Ocean and must traverse the entire continent before reaching the west coast. The west coast is dominated by the cold water upwelling system known as the Benguela Current with its associated, prevailing cool, dry onshore winds. The result is very low rainfall near the coast (0 – 25 mm annual mean) and higher rainfall inland (up to 300 mm mean annual in the study area) with a steep rainfall gradient across the northwest area (Figure 5.1). Rainfall in drylands is highly variable from year to year and at any one site. As a result, the rainfall range rather than the mean is a better indicator of the rainfall, although such data are not readily available in the study area (Map No 501). Almost all of the annual rain falls during December to April. The seasonality of rainfall is an important driving force of biological and social processes in the area.

Mean potential evaporation in the area is around 3000 mm per year, increasing from north to south. Rainwater is rapidly lost from the ecosystem and water is generally not available on the surface for much of the year. Where surface water is present, at springs and wetlands, the high evaporation rate frequently results in highly saline soils. High evaporation rates also reduce the efficiency of artificial dams in the area.

Average daily maximum temperatures for the hottest month of the year, most often between January and March, range from below 31°C at the coast to above 34°C inland. Average daily minima for the coldest month, usually June, range from over 10°C at the coast to about 3°C inland. The coastal part of the northwest area can be classified as cool desert, with a high occurrence of fog, while further inland it is classified as a warm desert, with summer rainfall.
5.3.1.2 Topography and soils

Topographically, the area lies on and to the west of the Great Western Escarpment. The escarpment is dissected by the ephemeral rivers traversing the area from east to west and is not well developed, particularly toward the southern part of the study area (Map No 502). The highest mountain in Namibia, the Brandberg at 2573 m, lies south of the Ugab River in Erongo Region. The Baynes Mountains at 2038 m and Joubertberge at 1869 m, lie along the line of the escarpment in the Kunene Region. Spitzkoppe at 1728 m is an isolated inselberg further south in Erongo Region to the east of which, and outside but related to the study area, lie the 2319 m Erongo Mountains. All these mountains, and other outcrops and mountainous areas with lower maximum elevations, provide scenic and recreation value to the area (Map No 503).

To date, the few studies of soils in the northwest have been conducted have mainly focused on irrigation potential. Alluvial and colluvial deposits are generally responsible for the thickest and most fertile soils in the region. Alluvial soils develop in deposits laid down by a flowing river while colluvial soils form in materials moved down hill slopes which have accumulated near the base of the slopes. Deep alluvial and colluvial deposits are common in many of the major valleys but such soils are often calcareous and saline with limited potential for irrigation. When subjected to heavy vehicle traffic or even livestock trampling, they break down into a fine, highly erodible silty powder which is easily mobilised by wind or water.

Close to the coast, soils consist of either littoral sands or halomorphic soils, often associated with gypsum or salt deposits. Such soils are sensitive to damage from off-road driving, and tracks on these surfaces persist for decades. Further inland, soils are generally calcareous with limited or no value for irrigation. Throughout the area, soils are generally thin and weakly developed, often overlying hard rock surface. In many areas the bare rock is exposed.

Within floodplains of the ephemeral rivers, alluvial soils composed of alternative layers of sand, silt, clay and gravel have been laid down. The soil profile depends on the magnitude of individual floods and the source material available in the upper catchments. The increasing loss of vegetation and subsequent degradation of alluvial soils from compaction is noticeable in ephemeral rivers. This process is prominent in fine-grained soils such as those around Sesfontein. After surface compaction, caused by the presence of large herds of livestock, the rain water is prevented from infiltrating the soil. This results in surface run-off often accompanied by increased soil erosion. There may be a
correlation between declining groundwater tables and the limited groundwater recharge associated with this type of soil degradation.

5.3.2 BIOTIC ENVIRONMENT

The study area supports a diverse assemblage of plants and animals. Reptiles, small mammals, birds, insects, arachnids and other small faunal elements live in the area, with many endemic elements contributing to the diversity. Similarly, there are a number of interesting, some endemic plants, such as the Commiphora species, that contribute to the floral diversity. Most of these plants and animals are not easily visible nor easily accessible so will not be described in this chapter (See Annexure “B”). A number of especially unusual, endemic desert species live in the Skeleton Coast Park. All these smaller, less conspicuous species are dependent on the continued integrity of their habitats, as are all elements of the biota, and can be expected to warrant more attention in the future.

5.3.2.1 Vegetation

Rainfall variation is the primary determinant of the vegetation, throughout Namibia and in the northwest, augmented by variability in soils, topography and temperature (Map No 504). Rainfall influences the species composition of plant communities across the rainfall gradient and also the structure and productivity of individual trees. Taller trees in the east give way to stunted shrublands further west and finally ephemeral grasslands in the arid west. Mopane dominates the woodland savannas and shrublands of Kunene Region while a mixed assemblage of acacia and other woody species dominate in the Erongo Region. The transition area, between the savanna and semi-desert and which straddles the broken escarpment, supports a great variety of species, many endemic to the area. Grasses grow throughout the study area and provide the basis for the grazing systems of livestock and wildlife.

The botanical diversity and physiological variation in the area is very high. The mountains that capture rainfall can dramatically alter vegetation patterns in the region. Isolated mountains, or inselbergs, throughout the area are often associated with higher rainfall and different soil types than the surrounding landscapes, resulting in unique floras. Variations in topography, caused by the evolution of drainage lines and river courses, result in sites of soil deposition, increased soil moisture and groundwater storage which provide islands of suitable conditions for plant growth and survival. Such sites are characterised by increases in productivity and unique assemblages of plants such as w find in riparian forests associated with the western rivers. Temperature can also affect
vegetation patterns. The lack of mopane south of 21°S latitude is thought to relate to temperatures and the plant's intolerance of frost.

One of the most striking vegetative features of the northwest is the riparian forests that dissect the arid landscapes. In the larger rivers, these riparian forests are composed of dense forests of larger trees, including ana trees (*Faidherbia albida*), leadwood (*Combretum imberbe*), mopane (*Colophospernum mopane*), camel thorn (*Acacia erioloba*), Tamarix (*Tamarix usneoides*), ebony (*Euclea pseudebenus*), figs (*Ficus* spp.) and palms (*Hyphaene petersiana*). These riparian forests are frequently referred to as linear oasis, reflecting the importance of these systems that provide food and water for humans and animals in this arid landscape.

Riparian forests are well adapted to the natural variability in flow regimes. Average floods fill the river to its banks, maintaining the forests by providing essential nutrients and water. Over long periods of little or no flow, the water table may drop and older trees die out leaving space for younger trees. Massive episodic floods have the most long-lasting impacts on the structure of the riparian forests. These floods may have return intervals that are as long as the normal life expectancy of the trees. They may demolish entire forest reaches, create new channels within the flood plain and recharge groundwater. They also provide soil moisture and nutrients and deposit seeds. Evidence of these incredible events can be seen along the outer edge of the current flood plains. Branches, logs and whole trees, carried in episodic floods over the past hundred years, are found stranded along the lower reaches of these ephemeral rivers.

Forest composition varies along the length of the ephemeral rivers in the study area. Many of the rivers have narrow canyon reaches where flow velocity is high. Fig trees (*Ficus* spp.) are usually the only trees that can survive in these reaches of the river. Where the alluvial soil is deeper, and trees dominate. They have roots and shoots which sprout when damaged during floods and these coppice clumps are better able to withstand the force of flood waters than small, single stemmed trees. The diversity and density of tree species decrease from the upper catchment toward the mouth in all the ephemeral rivers while the species diversity decreases from north to south.

All of the major ephemeral rivers in the study area contain wetlands. The soils remain wet for most of the year where groundwater is forced to the surface by shallow bedrock. A range of plants, typically salt tolerant and capable of rooting in saturated soils, grow in these wet places. Most common are reeds and sedges, including *Phragmites*, *Typha*, *Scirpus*, *Juncellus* and *Cyperus* species.
Large stands of bushy *Tamarix* and *Sueda* also grow in wetlands. Most of the river mouths have meandering channels that support saline or freshwater marsh vegetation. An unwelcome contributor to the flora of the ephemeral rivers in the study area are the alien plants, many species of which have become well established. These alien species include the woody *Prosopis* and the shrubs *Nicotiana glauca* and *Datura* spp.

The dependence of vegetative recruitment upon rarely occurring climatic events must influence management of the vegetative resources. Episodic events, such as high rainfall or large floods, create conditions for the establishment of some plants which may not happen again during an individual plant's lifetime. Overuse and elimination of such species can alter the environment and its capacity to support populations of people, livestock and wildlife. In the study area, livestock frequently graze upon or trample young shoots preventing new forests, shrublands and other vegetation to grow.

Toward the coast, the *Welwitschia mirabilis*, as unusual as its name implies, is found in dry washes while the *Acanthosicyos horridus* occupies the lower reaches of the larger ephemeral rivers. Lichens growing in the fog zone represent the most diverse plant assemblage in the study area.

### 5.3.2.2 Wildlife

Livestock and wildlife are dependent on the same limited resources, food and water. The abundance of wildlife in the study area is dependent on their mobility which centres around the source for food and water. Herds of springbok, gemsbok, Hartmann's zebra and ostrich graze grass patches wherever rains have fallen. Riparian vegetation is the preferred fodder year round for animals such as elephant, rhino, giraffe, baboon and kudu whose ranges extend westward from higher rainfall areas. Regular movements in and between catchments and their rivers are a normal part of life for animals in the study area. Developments that eliminate surface water and degrade vegetative resources make movement between resources difficult.

Elephants and rhinos, and secondarily giraffe and lions, are the wildlife species upon which the reputation of the study area rests (Map No 505). These have fluctuated widely in the past few decades. In the late 60's the elephant population of Kaokoland (the northern part of current Kunene Region) was estimated to between 800-1000 and rhino's were reported to be numerous (Owen-Smith, 1970). In the early 70's Damaraland and Kaokoland (current Kunene Region) was subjected to unrestricted hunting by military and professional hunters that reduced the wildlife populations to a fraction of their
previous levels. By 1978 it was estimated that less than 50 elephant and 15 rhino remained in western Kaokoland. In the early 80's wildlife was further decimated by a severe drought. The drought also caused a large decline the domestic stock populations of the region. The wildlife suffered another blow when the SADF issued 2000 .303 rifles and 200 000 rounds of ammunition to the local population to protect themselves from the SWAPO insurgents. As a result, many people who had seen their domestic stock die during the drought turned to poaching wildlife in order to survive. By 1982 P.J. Viljoen found only 36 elephants and a speculated that only a handful of rhino remained.

The Ministry of Environment and Tourism conducted a simultaneous wildlife survey of Damaraland, Kaokoland and the Skeleton Coast Park in 1990 (Carter, 1990). It was noted in this survey that the numbers of elephant had increased to 233 and rhino numbers were estimated at 102. From this survey it was further noted that 8 species of mammals are designated as rare/very rare, 7 species were vulnerable, 11 species were insecure and 2 were protected species. In 1995, a further aerial survey was conducted in conjunction with the "elemap" project and this put the number of elephant and rhino in the region at approximately 450 and 80 respectively.

Endangered species: Of the endangered species the desert Rhino's of the Northwest are the best known. A considerable conservation effort, by two non-government organisations (NGO's), Save the Rhino Trust (SRT) and Integrated Rural Development and Nature Conservation (IRDNC) and the Ministry of Environment and Tourism, has gone into the protection of this species. Most remaining rhinos (estimated at 120 individuals in 1998, SRT census) outside of protected areas are to be found in the western regions of Kunene Region, below the 100mm isohyet, ranging from the Ugab river in the south to the Hoanib river in the north.

While elephants are not an endangered species in Southern Africa, the elephants of the northwest do deserve special mention. There has been a mystique created by the so-called "Desert Elephants" as they live in arid and semi-arid regions ranging over great distances. Genetically they are the same as elephants in Etosha, but their behaviour has been modified by their arid environment. Their home ranges are much larger than home ranges of other savanna elephants due to limited and discrete availability of fodder and water. Their story is similar to that of the rhino: large declines in populations from poaching occurred in the late 70's and early 80's with populations crashing from over 1000 (late 60's) to about 200 (mid 80's). Recent census data show that elephants have increased again to approximately 450 individuals. Until recent times their home ranges have been confined to areas where there are few
people, particularly the Hoanib and Huab river catchments. This range has recently expanded to include the Ugab River (B. Loutit, SRT, pers.com.) an area where elephants haven't been seen for over 60 years. This has led to conflicts with human residents of the area. As both human and elephant populations are increasing and both require the same natural resources, land and clean water, further conflict can be expected.

The tourism value of elephants and rhino is extremely high. They are the highlight of most tourists' trips to the northwest. However, conflicts have been increasing in recent times between tourists and large mammals. While rhino's tend to be shy animals and avoid humans, elephants regularly approach human settlements and tourist camps to drink water. Several tour companies offer special tours to see either elephants or rhino in the Kunene Region, reflecting the ability of these two animals to attract tourists.

5.4 ENVIRONMENTAL SENSITIVITY

For the purposes of this status quo information on the environment, environmental sensitivity is defined as the ability of an ecosystem to cope with physical or environmental change caused by people, their domestic stock or other activities. In the arid and semiarid areas of north-western Namibia the controlling factor in the ability of an ecosystem to recover from a man-induced change is rainfall. The number of endemic and endangered species adds to the sensitivity of an area from a biological and ecosystems perspective (Barnard, 1998).

5.4.1 REGIONAL FACTORS

Low rainfall: Approximately two thirds of the landscape encompassed in the Kunene and Erongo Regions has a mean annual rainfall of less than 150 mm and can be considered sensitive. Ecological disturbances in this area, whether they concern a loss of vegetation, impacts on the soil or disruption of water sources only can be reversed over a long period of time, if at all.

Endemism: In the western part of the Erongo and Kunene Regions, with less than 150 mm of rainfall, up to 132 endemic species (birds, mammals, plants, reptiles and frogs) have been recorded for one quarter degree grid square (Map No 508). As the national average is approximately 25 endemic species per quarter degree grid square, the northwest represents an area of high and unique endemism for Namibia.

Endangered species: The desert rhinos are the best know of the endangered species living in the study area. These individuals represent almost all of the
NUMBER OF ENDEMIC SPECIES

Map 506

LEGEND

Study area

Topography
300m interval

Annual mean rainfall <150mm

No. of endemic species

132
100
65
26
0

0 50 100 Kilometers

MINISTRY OF ENVIRONMENT AND TOURISM

URBAN DYNAMICS
TOWN AND REGIONAL PLANNERS

Created by DRFN for the Northwest Tourism Master Plan (1999)
black rhinos in existence and living outside of protected areas. They are to be found mainly in areas of less than 100 mm mean annual rainfall. The high degree of endemism, in the varied topography, suggests that other, less obvious, species could become endangered as pressures on the natural environment increase in the area.

**Environmental stressors:** The northwest is an area of low rainfall where wildlife and domestic livestock, present in the area on an intermittent basis, were the major users of the vegetation and water resources until relatively recently. According to the Ministry of Agriculture, Water and Rural development (MAWRD, 1997) land with less than 100 mm mean rainfall is unsuitable for livestock farming. Nevertheless, during the past century an increased number of sedentary livestock, farm fencing, the east-west veterinary fence, sedentary grazing patterns, irrigation on alluvial soils, communal land tenure and tourism have all added to stresses on the natural environment.

### 5.4.2 SPECIFIC SENSITIVE AREAS

Within this broad canvas presented by the and natural environment of the north-west, a number of localised areas are particularly sensitive. Many of these are equally attractive to wildlife, residents with their domestic stock and tourists.

**Permanent and seasonal wetlands and other natural water points:** Many of the permanent and seasonal wetlands are located in the courses of the ephemeral rivers (Map No 507). They support a varied flora and attract wildlife, livestock and tourists. Throughout the northwest, a number of natural springs, seeps and pools attract wildlife, livestock and tourists. Such sites are also sensitive to attempts at ‘improvement’ as road crews, army personnel and other well-meaning persons have attempted to do over the past several decades.

**Riparian forests:** Ephemeral rivers of the northwest support a riparian woodland that provides shelter, food and water to wildlife and domestic stock and building materials to people. These woodlands are sensitive to disturbance, particularly from prolonged and intensive use and occupation by people and their livestock and tourists. Regeneration of these woodlands can be hampered by the continuous presence of livestock.

**Coastal concerns:** Near the coast, lichen fields on gypsum surfaces are particularly sensitive to disturbance. Estuaries, such as on the Cunene at the mouth of other rivers, and the Uniab Delta are two water-based ecosystems that have proved to be particularly sensitive in recent years.
Although the entire study area is sensitive to a degree, because of its aridity, high degree of endemism and relatively high population pressure for an arid area, specific sites vary greatly in their innate sensitivity to potential developments. Developments to date have not taken into consideration the above aspects when they have been initiated. Moreover, although some adequate legislation is in place, much of it is not backed up by regulations or, if regulations exist, by their enforcement.

5.5 IMPACTS TO DATE ON THE NATURAL ENVIRONMENT

The natural environment in the study area has been used in a variety of ways and subjected to different uses during the past century. Much of the area has been used as communal rangeland, first on a migratory basis and then on a more sedentary basis throughout the past century. Livestock was dependent on natural waters and numbers of livestock fluctuated widely with rainfall and droughts. Travellers' reports also comment on veld fires in the northern part of Kunene Region, a phenomenon that has not occurred in recent decades. Large, migratory livestock herds probably use the landscape in a manner that most closely resembles wildlife movements and consequently they would be competing with wildlife for water and grazing. Trampling by slow-moving livestock has a greater impact on the soil structure than does wildlife.

In the southern part of Kunene Region, farms were fenced in the 1940's and mainly used for livestock with the wildlife in the area granted nuisance status by the farmers. None of the fenced farms were very successful and long-term productivity was probably reduced by the use of woody vegetation and impacts on soil and grazing. In the 1960's the Odendaal Commission took back the driest farms and incorporated them into Damaraland, as part of the homelands policy of South Africa (Kambatuku 1996, Hamakwaya 1999). Some of the communal grazing areas were established early in this century, e.g. Fransfontein, the Sesfontein area, Okombahe and the Kaokoveld, and have never been fenced. (See Map 508: Land Tenure) Fencing has led to sedentary livestock grazing, until water or graze disappears, and has a greater, long-term impact on the natural environment sometimes leading to landscape conversions. This impact takes the form of inducing a shift from perennial to annual grasses and reducing the recruitment of woody vegetation. Similar to the migratory livestock herds, the sedentary ones would be competing with wildlife for water and grazing and may totally exclude more sensitive species of wildlife from water holes. Trampling has a long term effect on soil structure and may have a long term effect on natural water holes and wetlands. Boreholes accompany fenced farms and the water table and the numerous boreholes that have dried up after use attest to the impact upon the water table (Loutit, pers. comm.).
During the struggle for Namibia's Independence, the army slaughtered wildlife in a large scale. To protect themselves, residents were armed and were in a position to use wildlife as a source of meat. In the 1960's the Veterinary Fence or 'Red Line' was built across the country from east to west, isolating endemic livestock diseases in the northern communal lands from affecting the export herds on commercial farms to the south. In the west, this fence ran along the northern boundary of the fenced 'Odendaal' farms, effectively cutting the present Kunene Region in half. All of these factors have had an effect on the use patterns of the land and on the populations of wildlife although neither of these impacts is irreversible unless accompanied by other changes in land use. Poaching has been almost stopped in the area where rhinos, elephants and antelope were the main targets.

More recently, tourism has become a major land use in the area, in southern Kunene Region since the 1960s and in northern Kunene Region since the 1980s. The Skeleton Coast Park was established in 1975 but tourism in the area followed only later. Tourism in the unproclaimed conservation areas which represent most of the study area can have a variety of impacts. Tourism usually focuses on wildlife and hence tourists travel where wildlife is most likely to be found. This includes the more arid western parts of the study area. Wildlife, and hence tourists, are attracted to water points, which tourists may then impact by indiscriminant driving or camping so as to disturb wildlife and damage water sources. Pollution, in the form of littering and solid waste, human waste and fluids associated with vehicles, is common. Wetlands, springs and riverbeds are most affected by tourist activity while the plains only secondarily so. Collection of rare and endangered plants and animals is a potential impact, the extent of which is not currently known.

All of the above land uses have impacted on the natural, biophysical environment and are determinants of the status quo situation. Some of these impacts are reversible with careful planning and management. Nevertheless, the study area occupies a beautiful but rough landscape, covering a large and varied area, where wildlife, people, livestock and a diverse flora represent the renewable resource base. In the perspective of Namibia, it is a rich, unique area of social, economic and environmental importance to the nation.
6. TOURISM PERSPECTIVE

6.1 INTRODUCTION

The aim of this chapter is to provide a status quo report on tourism in the communal areas of the north-west Region. The communal areas will constitute the focus area, and will be referred to as such in this chapter. However, this report will be taking into account activities on the surrounding commercial farms, national parks and urban areas. When referring to all of the project study area, this will be named the project area. The national, regional and local perspective will be taken into account.

6.2 REVIEW OF EXISTING PLANNING PROJECTS

The review of the following documents gives the main findings of the reports and does enter into discussions of issues other than those covered in the document under review.

6.2.1 GUIDELINES FOR THE DEVELOPMENT OF THE CENTRAL NAMIB, (MET, 1986)

This report gives guidelines and recommendations for development in the central Namib, which extends from Swakopmund to Sesfontein, including Hobatere Lodge. Topics covered include agriculture, prospecting and mining, fisheries, nature conservation and tourism. The document highlights ten areas meriting “national heritage status”. These include:

- Doros- Brandberg- Messum- Ugab mund area,
- Hoanib-Ombonde River,
- Lower Uniaib, Kuiseb and Ugab Rivers,
- Cape Cross,
- Walvis Bay Wetland,
- Sandwich Harbour,
- Spitzkoppe
- Wlotzkasbaken.

Other areas needing special conservation status were identified as springs, river courses, lichen communities, coastal dune hummocks, gypsum crusts and endemic or endangered species. Environmental problems identified included the damming of the ephemeral rivers, small scale mining, the veterinary fence, uncontrolled subsistence livestock farming, commercial fishing, human activities
at springs, the provision of water points, the development of a harbour at Mowe Bay and alien vegetation.

In terms of tourism, a distinction was made between 'wilderness' rest camps and larger more formal rest camps. Apart from the existing Khorixas, Swakopmund and Terrace Bay rest camps, additional formal camps near Mile 108 and Otjivasandu were recommended. Seven upmarket 'wilderness' camps were recommended at Palmwag, Sesfontein, Ombonde, Hobatere, Huab, Ugab and Omaruru. Six camp-sites were identified along the coast between Terrace Bay and Swakopmund. Other campsites were recommended at Spitzkoppe, Okombaha and Goantagab. Day facilities and information boards were recommended at the Petrified Forest, Twyfelfontein, the Burnt Mountain and the Brandberg.

The formal facilities were planned to create circular routes and the more informal camps to meet the needs of tour operators. It was also recommended that the Western gate of Etosha be opened to the general public to create links to Etosha. The same recommendation was made for the Ugab and Sprinbokwasser gates of the Skeleton Coast Park to encourage links with Swakopmund. The potential of hiking and pack animal trails was suggested for the period April to September. The first was from the Brandberg to the Ugab River mouth; the second was from the Ombonde River to Sesfontein and the third from Rooibank down the Kuiseb River delta to Walvis Bay. Provision was made for controlled 4x4 routes linking the 'wilderness' camps.

The responsible authorities for implementation were identified as the Department of Agriculture and Nature Conservation, The Damara Representative Authority, the Swakopmund and Walvis Bay Municipalities and the Provincial Administration of the Cape of Good Hope.

6.2.2 INTEGRATED COASTAL ZONE MANAGEMENT (ICZM) OF THE ERONGO REGION (MME, 1998)

This project falls under the Ministry of Mines and Energy. The main objectives and functions of the ICZM committee include: the promotion of environmental considerations in all aspects of development; co-operation and co-ordination between stakeholders; land use planning; reviewing development plans; suggesting rules for behaviour and use of areas and developing, updating and disseminating information.

The project is managed by the Erongo Regional Executive Officer, Senior Chief Control Officer (Ministry of Local, Regional Government and Housing), Chief
Warden (Ministry of Environment and Tourism), and the Project Team Leader. The implementation of the programme relies on the decentralisation of public administration to the Regional Council. This process may be delayed and cabinet endorsement of the management functions of the CZM Committee may be sought. The CZMC has its legal base in the Regional Council's Act 22 of 1992. The CZMC is an advisory committee to the Regional Council. The CZMC shall include Town Councillors, a Regional Councillor, representatives from several ministries, private sector and municipalities.

6.2.3 CONCEPTS FOR A CORE AND GREATER BRANDBERG MANAGEMENT PLAN (MET, 1996)

This plan was requested by the National Monuments Council, Ministry of Basic Education and Culture and was conducted by the MET. This report states that tourism development at the Brandberg itself (Tsibab Gorge) should be limited to shade parking, lock up parking, day visit facilities, limited water supply, staff control kiosk, interpretative display centre and long-drop toilets. Showers and water born toilets are to be discouraged due to limited water during dry periods. Overnight facilities should be restricted to the Ugab and Numas River junction and the area between the rivers and the mountain. Campsites should be set back to the south of the entrance road. It was further recommended that monitoring be done to establish future carrying capacity.

The greater Brandberg Area, including part of the West Coast Recreation Area, would be considered as a buffer zone and these areas included in a People’s Park which could include Twyelfontein and the tourism concessions in southern Kunene. This could be envisaged to be a World Heritage site or Biosphere Reserve. It was recommended that the following be upgraded to World Heritage Sites: Brandberg massive, Dorros Crater/ Gaantegab/Ugab Gorge, Unlab and Aub Canyons and the Hoanib River adjoining the flood plain. Adjoining sites for upgrading would include Twyelfontein and the Burnt Mountain complex and the Khowareb Schlucht. The proclamation of the proposed park has been considered essential by the National Tourism Strategy, the National Rhino Conservation Plan and the Namibian Elephant Conservation and Management Plan.

These plans hope to achieve a joint venture between Government, the regions and local communities through joint management, conservation and utilisation. Much support has been obtained for these initiatives from regional leaders, traditional authorities and the community. During public meetings related to this project, concerns were raised by the traditional authorities concerning
management and benefits from these areas. The intention to form a conservancy in the area was also mentioned.

6.2.4 SESFONTEIN LAND USE PLAN (MAWRD - 1997)

A participatory land-use planning exercise was done in the Sesfontein area, by consultants for the Ministry of Agriculture, Water and Rural Development. This included socio-economic and infrastructure profiles as well as planning utilising local expertise and consultants. Resources considered included water, soils and gardens, livestock and grazing, as well as wildlife and tourism.

Future scenarios and land use zones were based on land capability and community consultation. Four land use zones were identified, urban (including the gardens), mixed wildlife and stock area, emergency grazing areas and a core wildlife zone.

The investigation established the existence of a strong conservation ethic from the local population. There was also a strong acceptance of mixed wildlife and domestic stock farming as well as firm commitment to allocate large areas for the exclusive use of wildlife and tourism. The envisaged conservancy establishment in the area would ensure that community benefits from wildlife and tourism would increase, thereby making this sector locally more competitive. Conservancies were considered the most appropriate local authority for dealing with wildlife and tourism related issues. This sector was identified as the most important growth sector for local development in the Sesfontein area.

The need to do this in a controlled fashion in conjunction with the MET was stressed. The roles of all parties, both government ministries and NGO's needed clarification to ensure that support agencies are aware of one another's roles and responsibilities. This has caused confusion within the community and detracted from the success of development within the area. A high level of community commitment was obtained in the development of this plan but inter-ministerial conflict resulted in the plan being delayed. This plan has been approved by the Regional Council and is awaiting inter-ministerial comment and allocation of responsibilities for implementation.

6.2.5 KUNENE REGIONAL LAND USE PLAN (PART ONE – 1998, MLRR)

A land use plan has recently been prepared by the Ministry of Lands, Resettlement and Rehabilitation (sub division, Land Use Planning). The Kunene Region is the first regional land use plan to be done. The main purpose
of the plan is to provide information to the regional authorities on the natural resources of the region and to provide a framework for sustainable natural resource based regional development. Further objectives included developing national land use planning guidelines, providing an environment for the application and testing of new policies and legislation, providing a first step in the dynamic and incremental process of land use planning and to provide a zoning scheme which will hopefully reduce existing and potential land use conflicts. The zoning remains a proposal until consultative meetings with constituencies has been carried out. "It is recommended that the most sustainable development pathway for the region is that one recognises those policies, technology and institutional arrangements need to be locally adjusted to reflect the realities of the local people."

Tourism is noted as a growing industry in the region, but its benefit to local people is yet to be demonstrated. Tourism and wildlife were noted as areas of potential growth. The document highlights that; "...the challenge is to plan the region in a manner that those who live there improve their quality of life through a process which they control. Planning should be open to opportunities to integrate the inhabitants of the region into the national economy through pursuing the most sustainable land use practises".

The report states that cognisance should be taken of the proposed Epupa Hydro Electric Scheme and Mowe Bay developments as well as cultural differences, wildlife and its impact on people and tourism potential.

The Regional Council's main function is to spearhead development. The report states that, at present line ministries and NGOs do not work through the Regional Council when they have projects to execute in the area. This is noted as seriously undermining the Regional Council and that the decentralisation policy should improve this. Conflict between the traditional leadership and the regional council was noted and that both lacked capacity needed for participatory development. A lack of co-ordinated development, and a lack of comprehensive land use planning were evident within the area.

Wildlife was noted as one of the most important natural resources in the Kunene Region. This includes many species including desert elephant and black Rhinoceros. The report states that wildlife is restricted to areas west of the 150mm isohyet. Wildlife numbers have steadily increased mainly due to reduced poaching as a result of better law enforcement and community commitment to conservation. Community based conservation has been well established by NGOs operating in the area.
Livestock numbers are reported to fluctuate with rainfall, with dramatic reductions during the 1981/82 drought. These levels have slowly increased to the point where there is more livestock in the former Kaokoland than on the Outjo commercial farms. This was explained by the diversification of farmers into the wildlife industry and the financial problems experienced with restocking. It was mentioned that there is a need to address livestock removal on communal lands, which at present is only to meet specific (social and financial) needs, and not general management needs. Boreholes are noted as a ‘tragedy of good intentions’, by throwing the system off balance and degrading the surrounding area.

The report claims that the conservancy legislation has resulted in a big shift in people’s attitudes toward wildlife. The viability of conservancies is questioned due to the low numbers of the most important species. Competition between wildlife, stock and people for water is mentioned, as are the significant problems caused by elephants to water installations and the threat to human life. The report questions whether farmers can run both wildlife and domestic stock and if not, which one should be given up? Livestock production is a tradition whereas game management is an opportunity. By forming conservancies people have accepted the risk of living with wildlife. Community organisation is integral to conservancy success and time will tell whether this new form of land use will add value to people’s lives. The relationship between conservancies and concessions is presently the subject of legal discussions.

Tourism was noted as a growth industry. The northwest is a well-known tourism destination and as a result tourist facilities are mushrooming, largely without control. The benefits of tourism to the local community are said not to have been well studied and that most benefits are in the form of bed night levies. It was questioned whether this contributed significantly to the food security objective. Community campsites were noted to be dogged by poor management. Joint ventures between communities and private entrepreneurs were noted as the most promising tourism ventures in the region. There is no control of tourists and few records kept. This is attributed in the northwest to the fact that there are no tourist attractions in that area. Tourism carrying capacity has not been established for the area. Considering the fragile environment of the area, tourism is at risk of destroying itself. Links between the private and communal sector is mentioned as being important. Most farmers are said to run safari operations with trophy hunting facilities, which often do photographic tours through the communal areas.
6.3 OVERVIEW OF EXISTING LAND USE PATTERNS

6.3.1 AGRICULTURAL ACTIVITIES

Agriculture forms one of the largest sectors of the Namibian economy contributing about 10% of Gross Domestic Product (GDP). The communal areas produce approximately one third of this. The agriculture sector is dominated by the production of livestock with beef production making up about 85% of the gross agricultural income. This sector provides a livelihood directly or indirectly to 70% of the population.

The low, erratic rainfall in the focus area means that agriculture is centred on livestock production. Disease control, necessitated by the European Union (EU), has divided the livestock industry of Namibia into two sections. Areas north of the veterinary control fence (The Northern Communal Areas) have quarantine conditions for the export of stock to the EU. This fence divides the communal areas of the focus area. Communal areas north of the fence produce stock largely for their own use with some produce being sold to the North Central Regions of the country. The off-take rates for the communal areas are considered to be between 5% and 8% per annum and about 10% for the commercial farms. The lower off-take rate on communal land can be attributed to cultural resistance, (which places an intrinsic value on stock), poor marketing infrastructure and a lack of suitable markets. Produce north of the fence may also be sold to countries with lower disease control standards such as West Africa. Communal areas to the south of the fence are free to market without international restriction. The extreme arid west of the focus area is not viable for livestock production. Stock moves great distances depending on the availability of grazing and water. This open access system of stock movement makes resource management extremely difficult. This needs to be addressed as it impacts heavily on the wildlife and tourism industry.

Table 6.1. from the 1998 Namibia Stock Census shows the communal areas of Erongo and Kunene to have more than 200 000 cattle, 700 000 sheep and goats and 18 000 donkeys and horses. The commercial areas have more than 100 000 cattle, 140 000 sheep and goats and 5 000 horses and donkeys. Overstocking and poor management is prevalent in both the communal and commercial farms and is worsened by the veterinary fence restrictions in the north.
### TABLE 6.1: NAMIBIA STOCK CENSUS

<table>
<thead>
<tr>
<th>Livestock</th>
<th>Communal Area</th>
<th>Commercial Area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>North of vet. Fence</td>
<td>South of vet. Fence</td>
</tr>
<tr>
<td>Cattle</td>
<td>176 000</td>
<td>39 270</td>
</tr>
<tr>
<td>Sheep</td>
<td>72 000</td>
<td>36 210</td>
</tr>
<tr>
<td>Goats</td>
<td>436 000</td>
<td>189 400</td>
</tr>
<tr>
<td>Horses</td>
<td>1 100</td>
<td>1 600</td>
</tr>
<tr>
<td>Donkeys</td>
<td>6 100</td>
<td>9 760</td>
</tr>
<tr>
<td>Pigs</td>
<td>700</td>
<td>488</td>
</tr>
<tr>
<td>Poultry</td>
<td>12 700</td>
<td>12 920</td>
</tr>
</tbody>
</table>

*Source: Directorate of Veterinary Services (1998).*

As rainfall is low and erratic, arable agriculture in the focus area is limited. In the focus area approximately 3 000 hectares of land is allocated to crop production. Farming is mainly rain-fed or irrigated by hand, and is undertaken on a small scale, household basis. Irrigation is practised in several areas, mainly along the Kunene River and from springs at Kaoko-Otavi, Warmquelle, Khowareb, Ongongo, Okombahe and Otjimbingwe. Marketing and other problems will probably prevent most schemes from rising above subsistence levels. The most common crop grown is maize, with wheat and horticultural crops being grown to meet family needs. The potential of high value crops such as oriental tobacco is being investigated.

### 6.3.2 WILDLIFE

Wildlife numbers in the western part of the communal land in Kunene and Erongo Regions have increased dramatically since 1981. This has been due to the combined efforts of the MET, NGOs, private sector and the commitment of local communities to farm with wildlife with a view to benefitting over the long term. The MET recognised this and acknowledged the need for sustainable utilisation of wildlife for communities that had populations, which could be harvested. To date, five hunting sessions have been approved by the MET in the focus area. Permits in the last three hunting seasons were allocated to the traditional authority and hunters were selected locally. Under the existing
legislation, this allowed the hunting of certain species for own use and the sale of the skins. Meat was distributed by locally appointed committees and skins sold to cover the cost of ammunition. The MET and NGOs assisted with logistics and monitoring. In areas not registered as a conservancies, there is a hunting season planned for 1999, which will fall under the jurisdiction of the Headman Council or by the Headman Council in combination with emerging conservancy committees where these are in operation.

Since 1982, wildlife has expanded the area it inhabits in the focus area. Species originally limited to small areas have moved and continue to move into areas in which the local community has committed to looking after it. More important examples of this include, elephant, which have in the last five years settled in the Hoarusib and the Ugab Rivers. Giraffe have moved northward from Purros almost as far as Roodtrom. The aim of wildlife on communal land is to diversify local economies and thereby spreading risk. The aim is not to replace livestock.

This increase in wildlife in the communal areas has associated costs for rural residents. Elephants have killed several people in the focus area, they continue to damage water installations and gardens, kill domestic stock and in reduce water quality and quantity in open springs. Grazing and browsing wildlife utilise the same areas (and resources) as domestic stock and competition results, particularly from springbok. Jackal pose to be a problem animal to stock farmers through out the area and losses to predators are common in some areas. Surveys of local people living in areas with high wildlife concentrations and predators, still present a very positive attitude towards wildlife.

Since Independence, a two-year trophy hunting concession was allocated by the MET in the focus area. Apart from meat, the local communities received little benefit and all trophy fees were paid to the central coffers and bed night fees to local tourism operators. This contract has since expired. The conservancy legislation passed by Cabinet during 1996, gives the same conditional rights of utilisation to communal farmers as are held by commercial farmers. Two conservancies (#Khoadi //Hoas and Torra) have since been registered and trophy hunting contracts have been signed by them. These fees will be paid directly to the conservancy committee, which will consult its members on the expenditure of the funds. This represents the first substantial step in allowing wildlife to compete (economically) with other land use forms on communal land. These two conservancies, if taken together, begin to provide a model of what can be achieved from the utilisation of wildlife and tourism on communal land. In these conservancies the first major step in economic sustainability has been taken.
The conditional rights to wildlife utilisation on commercial farms were devolved in the mid 1970s. This wildlife sector has over the last 20 years developed into a thriving industry. It has received much support from government and has learnt many lessons along the way. At present there are 17 Professional Hunters, 25 Masterguides and 38 Hunting Guides, registered with NAPHA, who gave addresses within these two regions. The communal areas are far from being in a similar position to that of the commercial areas, but it should be borne in mind that it has taken commercial farmers 20 years to reach this stage themselves. Mistakes are certain to be made and problems encountered, but with the industry founded on the same basic principle, that benefits related to wildlife are returned to those bearing the cost of living with it, the industry should also prosper in communal areas.

6.3.3 TOURISM

On a national scale the northwest region contains extremely important destinations and attractions. The focus area forms an important link destination between Namibia’s major attractions, namely Etosha National Park and the world’s biggest dunes, Sossusvlei. The attractions of the area are its wilderness appeal, unique cultures and desert - adapted wildlife. For this reason wildlife conservation and tourism should not be considered separately, since wildlife gives added value to the tourist experience. The focus area has an ever-increasing volume of tourism through the area, but has limited infrastructure and poor facilities for self – drive tours.

Community based tourism (CBT) is a relatively new concept in Namibia and has not been able to keep pace with the increased demand and has in general not been able to meet private sector quality needs. The MET, NGOs, conservancies and to a lesser extent the private sector are striving to improve this through joint ventures, bed night levies and training.

From the Etendeka bed night levy (1994/1995) approximately N$20 000 has been paid to surrounding communities. A further N$20 000 for the years (1996/1997) is currently being distributed. The Damaraland Camp joint venture has paid approximately N$100 000 per year to the Torra Conservancy Committee. Annual wages to local staff at this venture are about N$100 000 and several thousand Namibian Dollars is paid annually to local residents for other services (e.g. laundry).

The understanding of the tourism industry by local people varies. People living far from tourism ventures or those employed to do menial tasks at these
camps, have a poor or limited vision of the tourism industry. Joint ventures however, can ensure that local inhabitants receive appropriate training, and that the joint management committee with time will become more familiar with this complex industry. This awareness will in tum be related to the broader community.

Like all tourism initiatives, the CBT industry needs control. The MET, conservancies and NGOs, need to take into account differences between the communal and commercial environments when addressing tourism on communal land. Emerging and established conservancies are negotiating with existing concession holders to formalise their relationships. These negotiations also give added security to concession holders, clarify management roles and the benefits of such operations to the community. Concession rights are given to conservancies, as is the right to make recommendations to the MET on PTO applications related to tourism. With guidance from the Community Based Tourism Policy, Conservancies and Wildlife Councils are the present legal framework within Namibia to address wildlife and tourism issues on communal land.

The private sector tour operators and facilities existing in the major towns and commercial farms, have kept pace with tourist demand, and similar to the trophy hunting industry, are thriving. The challenge facing the focus area lies in harnessing the present tourist industry already functioning within the area, in a way that stimulates further growth and provides adequate control.

6.4 EXISTING TOURISM MARKET

6.4.1 NATIONAL PERSPECTIVE

Tourism is becoming an increasingly important contributor to the economic development of Namibia. A tourist is defined by the World Tourist Organisation as "a person who is not a resident of the country visited; who intends staying for at least one night and not more than one year". Table 6.2 shows total tourist numbers for 1997 and 1998. Total tourist arrivals grew by 10% between 1996 and 1997 and a further 10% between 1997 and 1998. Tourist numbers, excluding Angola, have increased from 243 000 in 1993, to 363 000 in 1998. An analysis of tourist arrivals for 1998 and 1997 is shown in Figure 6.1. Overseas tourists made up about 25% of the 1998 visitors to Namibia. The majority of these are from Europe, particularly Germany. The number of overseas tourists increased by almost 8% to 125 000, and South African tourists increased by about 5% to almost 200 000. The average length of stay for tourists for 1997 was almost 20 days.
Table 6.2: Total Tourist Numbers Visiting Namibia During 1997 And 1998*

<table>
<thead>
<tr>
<th>Citizen of Tourists</th>
<th>1997</th>
<th>1998*</th>
<th>% Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Angola</td>
<td>158,000</td>
<td>190,000</td>
<td>20.25%</td>
</tr>
<tr>
<td>• South Africa</td>
<td>188,000</td>
<td>198,000</td>
<td>5.32%</td>
</tr>
<tr>
<td>• Rest of Africa</td>
<td>37,500</td>
<td>39,500</td>
<td>5.33%</td>
</tr>
<tr>
<td>Total for Africa</td>
<td>383,500</td>
<td>427,500</td>
<td>11.47%</td>
</tr>
<tr>
<td>Total for overseas</td>
<td>118,500</td>
<td>125,500</td>
<td>5.91%</td>
</tr>
<tr>
<td>GRAND TOTAL</td>
<td>502,000</td>
<td>553,000</td>
<td>10.16%</td>
</tr>
</tbody>
</table>

* Figures for 1998 are provisional


Figure 6.1: International Tourist Arrivals In Namibia By Country Of Origin For 1997
(Leisure, Recreation And Holidays)


The most popular destinations in Namibia are Swakopmund and Etosha, followed by Sossusvlei, the former Damaraland and the Namib Naukluft Park. (See Figure 6.2) Approximately 50% of tourists visiting Namibia are on organised tours. It has also been shown that over 50% of tourists visiting Namibia are above 45 years of age. This therefore reflects that the Namibian tourism market caters largely for the older visitors. (See Figure 6.3)
Figure 6.2: Main Attractions Visited In Namibia


Figure 6.3: Mode Of Travel And Age Profile Of Visitors To Namibia


The tourist visiting Namibia is generally attracted to the game viewing, bird watching and nature tours. There are niche markets catering for trekking, fishing and cultural tourism. Seasonality is marked, with often 20% to 30% of annual visitors coming in July and August (high season) and February and March being the quietest months (low season).
6.5 REGIONAL TOURISM SECTOR

Figures for bed night occupancy rates in 1997, supplied by the PPMIU are given in Table 6.3. December, January and June are the months recording the highest number of visitors. The number of bed occupancy nights sold per month (by establishments with more than five rooms) was approximately 2 300 in each of the Kunene and Erongo Regions. The Etosha Region sold almost five times this and the Coastal Region more than 15 times this. Figures for Kunene and Erongo exclude the coastal facilities, CBTs, unregistered accommodation and Hobaterre Lodge. Bed occupancy rates for 1997 in the Kunene and Erongo Regions are low (12 to 14%). There are approximately 1 400 beds available in the both regions, providing about 35 000 bed occupancy nights. Foreign tourists dominate the occupancies in both regions, but this is particularly so for the upmarket camps in the Kunene Region which had 96% of their bed nights taken by overseas tourists. The Kunene has less than 4% of occupancies being taken by Namibians and the Erongo has about 20%. Occupancy rates for the coastal resorts are over 60%. The occupancy rates for the Kunene Region in particular which reflects the upmarket tented camps and lodges seem particularly low compared to observed rates in the region. This data should be used with caution if used for planning purposes.

Table 6.3: Estimated Capacity And Utilisation Of Project Area’s Accommodation Industry By Location

<table>
<thead>
<tr>
<th>Accommodation By Location</th>
<th>Bed Occupancy Nights</th>
<th>Guest Nights</th>
<th>Average Length Of Stay</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Offered</td>
<td>Sold</td>
<td>Occ. rate</td>
</tr>
<tr>
<td>Coastal Region</td>
<td>85 710</td>
<td>35 975</td>
<td>41.5%</td>
</tr>
<tr>
<td>Erongo Region</td>
<td>18 824</td>
<td>2 277</td>
<td>12.6%</td>
</tr>
<tr>
<td>Etosha Region</td>
<td>28 788</td>
<td>11 469</td>
<td>39.9%</td>
</tr>
<tr>
<td>Rest of Kunene Region</td>
<td>16 821</td>
<td>2 408</td>
<td>14.3%</td>
</tr>
<tr>
<td>ESTIMATED TOTAL</td>
<td>150 923</td>
<td>52 129</td>
<td>34.5%</td>
</tr>
</tbody>
</table>


It was estimated that in 1996 approximately 25 000 people visited the more accessible parts of the former Damaraland (Twyfelfontein area), 11 000 to the Skeleton Coast Park and about 4 000 more adventurous tourists going to the former Kaokoland area. Locals mostly visit the Skeleton Coast Park, while the northern route is a mixture of both local and foreign visitors.
Between 1994 and 1996, visitors to sites in the Kunene Region increased by 13% in some commercial lodges (Etendeka Mountain Camp, Khowareb, Epupa and Palmwag Lodge) and by 35% in areas such as the Hoanib River.

Again, this data must be viewed with caution and seen to represent a minimum increase in tourist numbers. Tourism data is accurate for the parks only. The other data is important in that it gives an indication of trends, but actual numbers are now far higher than this. This is evident from Figure 6.3, which shows that on a National scale about 50% of tourists are self-driven and a further 35% travel with tour operators. When local Namibian, self drive tourists (who comprise about 40% of the market and are not reflected in Figure 6.3), are added to this, the absence of a formalised tourism data collection system, makes an estimate of the number of tourists visiting the project area difficult to determine. This is further complicated by the fact that many of this sector do not utilise existing accommodation facilities. It was estimated by tour operators that at least 6 000 people visited Epupa Falls and 1 500 visited the Marienfluss in 1998.

6.6 RECENT DEVELOPMENT TRENDS

- There is increased demand for a Southern African tour, including Namibia, resulting in shorter trips to Namibia by overseas tourists.
- Tourists are, to an increasing degree, looking for special locations and facilities (adventure, wilderness and local culture).
- Tourists are, to an increasing extent, looking for ecologically and socially responsible destinations.
- The number of Bed and Breakfast operations, guest farms and hunting farms on commercial farms has increased rapidly. These all offer personal service.
- The trophy hunting industry on the commercial farms is well established while the communal areas have only recently started to realise this potential through conservancy formation.
- A considerable increase in overlanders has been experienced in the focus area.
- The number of self-drives in the focus area is increasing.
- The lack of regulated tourism within the focus area is resulting in the uncontrolled establishment of tourism facilities within the focus area. Many of these are sub standard.
The lack of control over tourists is resulting in the degradation of the environment, which, in turn, is detracting from the tourist experience.

As local residents and tour operators open up 4x4 routes, these sites become better known and are used by self-drives. This encourages the operators to seek new exclusive routes and hence opening up more new areas.

The fastest tourism growth is taking place outside of parks

The trophy hunting industry is becoming increasingly important.

To improve economies of scale of trophy hunting, conservancies are being formed on commercial farms.

6.7 TOURISM IN THE NORTH-WEST REGION

The north-west attracts both consumptive and non-consumptive tourism. Non-consumptive tourism dominates, but the potential for growth in the focus area in terms of consumptive utilisation must be taken into account. This is particularly important from a planning perspective, as these land-uses are incompatible within the same area. It was estimated by Barnes and Ashley, (1996) that in 1994, the contribution to National Income from non-consumptive utilisation in the focus area was approximately NS3 million. They suggest the potential of these areas for tourism to be 167% more or NS7.8 million per year. The contribution to national income was calculated by subtracting economic costs (including financing), from economic benefits for the activity.

For consumptive utilisation the 1994 figure was less than half a million Namibian Dollars, and the potential increase of 50% to about NS700 000. On a national scale the economic value of wildlife is small, but it is clear that it can play a major role on local development in the marginalised areas of the northwest (Ashley and Barnes, 1996). This can be achieved by diversifying local incomes, providing a compliment to stock farming on a large scale and a highly profitable alternative at prime sites. Social benefits include skills transfer of the tourism industry and institutional development.

Jones (1995) and Barnes (1995) identified two categories related to the focus area. Areas adjacent to parks (Etosha and the Skeleton Coast Park) were considered to have a current value (1994) to community income of NS14 per km sq, a potential value of NS58 per km sq. with stable resource stocks and a potential of NS75 per km sq. with improved resource stocks. Areas not adjacent to parks had lower values and lower potential. The current community income per square kilometre was considered to be NS14 per km sq., NS20 with stable stocks and about NS30 with improved stocks. Ashley
1995 suggests that community income can triple without any improvements in the resource base.

6.7.1 NON CONSUMPTIVE- THE PRODUCT PROFILE

The north-west region tourism product is made up of a combination of wildlife, scenic, wilderness, cultural and historic attractions. In general the focus area relies on well known attractions, including the Brandberg, Twyfelfontein rock art, the Petrified Forest, the desert elephant and rhino, the Kunene River, Epupa Falls and the Himba culture. The combination of vast desert landscapes, ephemeral rivers, traditional lifestyles, wilderness experience and desert adapted wildlife provides a valuable, marketable product.

The product can also be divided by accessibility, which generally decreases towards the northwest. This is consequently more expensive in terms of time and transport, although this is set off by the exclusivity such areas offer. This exclusivity creates the opportunity for adventure tourists, as does the option to canoe the Kunene River from Ruacana to Epupa Falls. Prime areas for the most profitable up-market eco-tourism development fall into these areas of the communal land.

A large portion of the focus area falls between the world-renowned Etosha National Park and Swakopmund, Swakopmund being Namibia's most visited tourism destination. It also forms part of a combination tour of Etosha and Sossusvlei via the northwest. The focus area contains attractions which are tourist destinations in their own right, but also captures tourists moving between these two tourist centres (Etosha and Swakopmund).

The major tourist attractions of the entire project area (communal, commercial and Parks) can be divided into three main attractions with impressive scenery being common throughout.

i) In the north-east the main attraction is the Himba culture and the Kunene River.

ii) The western strip has exceptional wilderness qualities and wildlife, including desert elephant and black rhino.

iii) The central area has wildlife, historical attractions and impressive geological formations.

The communal area (Otjimbingwe) to the south of the main Swakopmund to Windhoek road (B2) is scenically attractive and has some historically important
sights. Sites registered as National Monuments in the study area are in Annexure "C". Other places of interest within the two regions are indicated on Maps 607 and 608.

Visitors to the area use organised coach tours, fly-in safaris, tour operators or are self-driven using either 4x4 or 4x2 vehicles. Some tourists raft the Kunene River from Ruacana to Epupa Falls. Maps of these main routes are given on Maps 601 to 604.

6.7.1.1 Fly in Tours

A few companies specifically market fixed-route flying safaris, which may last longer than two days. These main routes are outlined on Map 601. Many companies sell one-day flying tours to the most popular sites. The focus of these trips is as much to show tourists the area from the air as it is to visit the destination. These operators also do air charters taking tourists to and from popular sites, but most of these are drop-off flights only. Some operators combine safari and flying tourists by flying to the destination, doing a game drive and flying back or spending the night at the destination before returning.

6.7.1.2 Coach tours

The main and alternative coach tour routes are shown on Map 602. Coach tours provide high comfort transport (air conditioning, comfortable seats and good roads), aim to see the most popular sites in a minimum of time, provide a high standard of accommodation (usually hotels or lodges) and food. These tours generally cater for the elderly tourist. The most popular route is to see animals at Etosha, followed by the dunes at Sossusvlei, and thirdly a combination of both including the north-west to see mainly scenery and historic sites in this area.

6.7.1.3 Tour Operators

Tour operator routes vary according to focus and expertise, but as a whole they visit all sites of interest. This is particularly so in the focus area where the only areas under control are the concession areas. Most operators sell a fixed route with as many attractions built in as possible (see Map 603). Etosha, being the most important destination, results in many operators combining Etosha with the north-west in a seven-day tour package. This may be combined with the south in a 14-day tour. Some operators specialise or have unique, tailor-made routes (e.g. rhino tours, camel tours or rafting).
Tour operators are divided into those using the 4x2 or 4x4 routes. The 4x2 routes are similar to those marked for the self - drives on the map. Several operations within the focus area take day trips or one night stops from their establishments, mostly for wildlife and cultural experiences.

6.7.1.4 Self Drive

Like the coach tours 4x2 self-drives tend to combine Etosha and Sossusvlei with the north-west as the third most popular option. More adventurous tourists and those with more time (and possibly lower budgets, or those who have been there before), will venture further along the alternative routes as mapped (Map 604). These alternative routes are becoming more popular.

The 4x4 self-drives are mostly South African and Namibian tourists, but foreign self-drives are increasing. Foreigners are often accompanied by Namibians, have been to the area before or have been exposed to marketing of the area. The recreational vehicle market is booming and the north-west is seen as an area where off-road vehicles can be put to the test. The alternative 4x4 routes are being utilised more frequently but here good local knowledge or a Global Positioning System (GPS) is necessary to avoid becoming lost.

The north-west is a harsh and hostile environment and can be potentially dangerous area for those unfamiliar with the conditions and necessary precautions that should be taken. Most overseas tourists, particularly first time visitors, would not feel safe on any of the routes in the remote areas.

6.7.1.5 Other

The back-packing, overlander and motor bike market is increasing. Backpackers are mostly limited to the tar road routes of the country or for the more adventurous, the coach tour routes. Some venture further but getting lifts are a problem.

Overlanders are increasing and utilising most of the focus area. Their bigger trucks, constantly venturing into new areas, are adding to the environmental impact.

Motor cyclists as individuals or in large groups are becoming more frequent. Although often well controlled, this sector needs special attention in terms of control.
Walking trails are only done formally in the Namib Naukluft Park and the Skeleton Coast Park. Up-market guided walking trails are becoming more popular.

Four wheel drive trails are offered in the Namib Naukluft Park.

Specialised tours by camel or rhino tours are becoming more popular.

6.7.2 EXISTING ACCOMMODATION – FOCUS AREA

An outline of the most important accommodation facilities in this area is given in Table 6.4 and Table 6.5. There are no hotels in the focus area. There are three urban rest camps, six up market lodges (one urban based), seven luxury tented camps, 15 campsites with showers and toilets (five of which are linked to lodges or rest camps) and four basic campsites. The rest, camps, lodges and luxury tented camps are used primarily by overseas guests and campsites by self-drives and some tour operators. Many operators are self-contained and camp at sites of their choice.

There are approximately 75 rooms and 146 beds available in urban areas of the focus area. There are additional 115 rooms and 208 beds available in upmarket lodges and tented camps. There are a total of 95 sites available for camping of which about 70, can be said to be run by local residents.

Table 6.4: Accommodation Capacity For Focus Area (including campsites)

<table>
<thead>
<tr>
<th>Type And Location Of Accommodation</th>
<th>Number Of Establishments</th>
<th>Camping Places</th>
<th>Number Of Rooms</th>
<th>Number of Beds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erongo:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Campsites</td>
<td>5</td>
<td>25</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Rest camps</td>
<td>1</td>
<td>-</td>
<td>27</td>
<td>54</td>
</tr>
<tr>
<td>Lodges</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Hotels</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Kunene:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Campsites (urban)</td>
<td>14</td>
<td>70</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Rest camps</td>
<td>2</td>
<td>-</td>
<td>48</td>
<td>92</td>
</tr>
<tr>
<td>Up-market lodges</td>
<td>6</td>
<td>-</td>
<td>51</td>
<td>100</td>
</tr>
<tr>
<td>Up-market tented camps</td>
<td>7</td>
<td>-</td>
<td>64</td>
<td>106</td>
</tr>
</tbody>
</table>

58
<table>
<thead>
<tr>
<th>Type And Location Of Accommodation</th>
<th>Number Of Establishments</th>
<th>Camping Places</th>
<th>Number Of Rooms</th>
<th>Number Of Beds</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Coastal Region:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Hotels</td>
<td>18</td>
<td>-</td>
<td>447</td>
<td>940</td>
</tr>
<tr>
<td>• Pensions</td>
<td>8</td>
<td>-</td>
<td>141</td>
<td>293</td>
</tr>
<tr>
<td>• Rest camps</td>
<td>12</td>
<td>-</td>
<td>425</td>
<td>1599</td>
</tr>
<tr>
<td>TOTAL</td>
<td>38</td>
<td>-</td>
<td>1013</td>
<td>2832</td>
</tr>
<tr>
<td>2. Erongo Region:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Guest farms</td>
<td>27</td>
<td>-</td>
<td>198</td>
<td>423</td>
</tr>
<tr>
<td>• Hotels</td>
<td>4</td>
<td>-</td>
<td>62</td>
<td>117</td>
</tr>
<tr>
<td>• Pensions</td>
<td>1</td>
<td>-</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>• Rest camps</td>
<td>1</td>
<td>-</td>
<td>6</td>
<td>14</td>
</tr>
<tr>
<td>TOTAL</td>
<td>33</td>
<td>-</td>
<td>281</td>
<td>584</td>
</tr>
<tr>
<td>3. Kunene Region:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Guest farms</td>
<td>15</td>
<td>-</td>
<td>139</td>
<td>310</td>
</tr>
<tr>
<td>• Hotels</td>
<td>2</td>
<td>-</td>
<td>56</td>
<td>110</td>
</tr>
<tr>
<td>• Pensions/Rest camps</td>
<td>2</td>
<td>-</td>
<td>24</td>
<td>52</td>
</tr>
<tr>
<td>TOTAL</td>
<td>19</td>
<td>-</td>
<td>219</td>
<td>472</td>
</tr>
<tr>
<td>4. Etosha Region:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Halali Rest Camp</td>
<td>1</td>
<td>-</td>
<td>72</td>
<td>168</td>
</tr>
<tr>
<td>• Namutoni Rest Camp</td>
<td>1</td>
<td>-</td>
<td>74</td>
<td>191</td>
</tr>
<tr>
<td>• Okaukue Rest Camp</td>
<td>1</td>
<td>-</td>
<td>93</td>
<td>299</td>
</tr>
<tr>
<td>5. Skeleton Coast Park</td>
<td>1</td>
<td>-</td>
<td>25</td>
<td>50</td>
</tr>
<tr>
<td>TOTAL</td>
<td>4</td>
<td>-</td>
<td>264</td>
<td>708</td>
</tr>
<tr>
<td>GRAND TOTAL</td>
<td>94</td>
<td>-</td>
<td>1777</td>
<td>4596</td>
</tr>
</tbody>
</table>

The main income generating establishments are clearly the lodges and rest camps. The most important of these are:

Khorixas Rest Camp
Brandberg Rest Camp
Ohakane Lodge
Desert Adventure Safaris (Palmwag Lodge and Sierra Kafema)
Etendeka Mountain Camp
Hobatere Lodge
Damaraland Camp
Fort Sesfontein
Syncro Camp
Epupa Camp
Skeleton Coast Fly In Safaris (Kwidas, Purros and Kunene Camps)
Kunene River Lodge.

Map No 605 indicates the location type and distribution of the main tourism facilities in the study area.

6.7.3 EXISTING ACCOMMODATION – COMMERCIAL LAND

This relates mainly to guest farms and registered hunting farms (see Table 6.5). Records relating to this information are for guest farms with a minimum of five rooms. This sector has responded to the need to provide personalised high quality service. There are at least 41 game farms and lodges on the commercial farms, and 24 hotels and 10 pensions in the urban areas (PPMIU, MET). There are at least 27 guest farms in the Erongo region, providing almost 200 rooms and 423 beds. In Kunene there are 15 guest farms with 139 rooms and about 310 beds. There are four hotels inland in the Erongo Region and eight in the Kunene Region.

In the coastal region (Swakopmund, Walvis Bay and Henties Bay) there are at least 18 hotels with 447 rooms and 940 beds. There are an additional 12 rest camps with 425 rooms and 1599 beds. There are eight pensions with 141 rooms and 293 beds. There are 21 other accommodation facilities, with 70 rooms.

6.7.4 EXISTING ACCOMMODATION- PARKS

The Skeleton Coast Park has approximately 50 beds available at Terrace Bay. Camping is available at Torra Bay, but is only open between December and January and for Easter. Olympia Reissen has a tourism concession within the
Park that is yet to become effective. The number of tourists visiting this concession area (through the concession holder) for 1997 and 1998 is approximately 100.

The Namib Naukluft Park only offers camping in the Namib, Sesriem and Naukluft areas. This has resulted in considerable tourism development on the surrounding commercial farms in the south and east.

Etosha National Park offers rest camps and camping at Okaukeujo, Halali and Namutoni. Luxury accommodation is offered at all three places. In Okaukeujo there are 93 rooms and 299 beds, in Namutoni there are 74 rooms and 191 beds and Halali has 72 rooms and 168 beds (see Table 6.5). There are no accommodation facilities in the west of Etosha.

6.8 TOURISM: CONSUMPTIVE

Wildlife occurs in varying densities in both the focus and broader project area. About 30 years ago (1968) legislation related to hunting on commercial farms was passed. This allows private farm owners, who have met certain conditions as laid out by the MET, to manage and utilise their wildlife. These same rights were only transferred to communal areas in 1996, through the conservancy legislation. The trophy hunting industry on commercial farms has developed substantially, and several communal areas are now in a position to expand into this sector and have both competitive and exciting products to offer. In the past, Trophy Hunting Concessions were given out in the communal areas, but this has now become the responsibility of the conservancies, where they are established and registered.

6.8.1 PRODUCT PROFILE: COMMERCIAL FARMS

On private land the number of game species has increased by 44% over 20 years and biomass by over 80% (Barnes and De Jaager 1996). The net economic contribution of wildlife on commercial farms increased from NS31 million in 1972 to NS56 million in 1992. The economic value of wildlife to farmers doubled over this time period (25 years). This is largely due to the need for farmers to diversify risk and capture a growing and profitable industry. The economic contribution of wildlife on commercial farms to the Namibian economy is likely to double again in the next 10 to 20 years.

These trends can be attributed to the change in legislation, which has resulted in better conservation practices by the commercial farmers themselves, and the benefits obtained from consumptive and non-consumptive utilisation. Wildlife was initially developed to supplement domestic stock farming, but an increasing
number of farms are now devoted purely to wildlife. Commercial farms are combining resources through the formation of conservancies, to increase profitability and marketability. Forms of utilisation include venison production, informal shooting, live sale of game, sport and trophy hunting as well as biltong hunting. The animals on offer vary widely according to the type of farm. Personalised service, hunting with adventure safaris and big game hunting are sold. All these farms are fenced and the average size of a farm is about 7 000 hectares.

During 1997, a total of 3 187 hunters visited Namibia, from 27 countries. This reflects a 14% increase since 1996, and a 77% increase since 1984. The most important countries visiting Namibia (see Figure 6.4) for hunting purposes were largely from Europe, in particular Germany. Average prices per animal and daily rates for the 1998 hunting season are given in Table 6.6.

Figure 6.4: Trophy Hunters In Namibia By Country Of Origin

![Pie chart showing hunting destinations by country: Germany 60%, Austria 14%, USA 6%, Spain 3%, France 5%, Other 12%]

Table 6.6: Average Prices For The 1998 Hunting Season

(March 99 Exchange Rate)

<table>
<thead>
<tr>
<th></th>
<th>Hunting farm</th>
<th>Guest farm</th>
<th>Safari Operator</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>US$</td>
<td>N$</td>
<td>US$</td>
</tr>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. 1 * 1 hunter</td>
<td>231</td>
<td>1478</td>
<td>350</td>
</tr>
<tr>
<td>3. 1 * 2 hunter</td>
<td>174</td>
<td>1096</td>
<td>274</td>
</tr>
<tr>
<td>4. Day of rest</td>
<td>98</td>
<td>817</td>
<td>125</td>
</tr>
<tr>
<td>5. Greater kudu</td>
<td>699</td>
<td>4403</td>
<td>750</td>
</tr>
<tr>
<td>6. Oryx</td>
<td>453</td>
<td>2854</td>
<td>531</td>
</tr>
<tr>
<td>7. Red hartebeest</td>
<td>449</td>
<td>2829</td>
<td>506</td>
</tr>
<tr>
<td>8. Springbok</td>
<td>306</td>
<td>1928</td>
<td>448</td>
</tr>
<tr>
<td>9. Warthog</td>
<td>329</td>
<td>2072</td>
<td>338</td>
</tr>
<tr>
<td>10. Steenbok</td>
<td>204</td>
<td>1285</td>
<td>267</td>
</tr>
<tr>
<td>11. Duiker</td>
<td>363</td>
<td>2287</td>
<td>281</td>
</tr>
<tr>
<td>12. Cape eland</td>
<td>1327</td>
<td>8360</td>
<td>1410</td>
</tr>
<tr>
<td>13. Blesbok</td>
<td>413</td>
<td>2602</td>
<td>473</td>
</tr>
<tr>
<td>14. Black wildebeest</td>
<td>1025</td>
<td>6458</td>
<td>1090</td>
</tr>
<tr>
<td>15. Blue wildebeest</td>
<td>1013</td>
<td>6382</td>
<td>913</td>
</tr>
<tr>
<td>16. Impala</td>
<td>430</td>
<td>2709</td>
<td>483</td>
</tr>
<tr>
<td>17. Hartman’s zebra</td>
<td>598</td>
<td>3767</td>
<td>686</td>
</tr>
<tr>
<td>18. Burchell’s zebra</td>
<td>595</td>
<td>3749</td>
<td>718</td>
</tr>
<tr>
<td>19. Ostrich</td>
<td>800</td>
<td>5040</td>
<td>600</td>
</tr>
</tbody>
</table>


The importance of control in the trophy hunting industry in Namibia is emphasised in that wildlife hunting quotas are stringently set and accommodation facilities, guides, master guides and professional hunters are subject to controlling legislation. Most guides and professional hunters are members of the Namibian Professional Hunters Association (NAPHA), which works closely with the MET in enforcing rules, regulations and ethics. Ethical hunting, based on the German code of ethics, is enforced by legislation. The fact that Namibia is a safe and stable destination is stressed. Each trophy hunter is bound by legislation to be accompanied by a professional hunter or guide whilst hunting. Permits must accompany the hunter at all times and be filled in on a daily basis. Trophy quality is evaluated using the Safari Club International (SCI) compatible system. A minimum length of stay is set to prevent the hunting of inferior trophies, below which the hunter can refuse to pay. Medals are issued to trophies in relation to their comparison with SCI standards.
Hunting Farms are divided into those hunting farms which offer hunting on a full time basis and those on a part time basis, with minimum legislative requirements. Guest farms, on the other hand, are accommodation facilities with or without hunting. Guest Farms must have a minimum of five guestrooms and standards are set higher that those on hunting farms. Guest farms are also graded. Apart from accommodation, trophy hunting operators also offer transport, tracking, hunting guidance and trophy preparation. After the hunt is finished, guests often join non-hunting friends to visit other destinations within the country on organised or self-drive tours.

Hunting Farms are self graded by NAPHA members into five categories for each species offered, ranging from very good species populations with record trophies available, to non-huntable species populations on the farm. The operator then also grades his operation into one of three categories ranging from excellent to good. This makes choosing a hunt easier for the client (Fair Chase In Namibia, NAPHA).

Hunting on Namibian farms, revolves around the hunt itself, the close contact with the farmer and family, his knowledge of the area, day to day farming activities and activities offered to non-hunting tourists. Hunts are normally done in the morning and afternoon, with a long midday rest at a hide or at the lodge. Hunting on guest farms is an up market extension of the farm hunt. The farm owner can employ up to two professional hunters (PH) to allow for two hunting parties. For both these categories, the main income is from livestock farming.

Hunting Safaris are available in upmarket or adventure types, or a combination of these. These safaris are mobile and therefore accommodate a wider range of hunting requests. The group generally leaves early in the morning on full day trips, in fully equipped vehicles. Stalking is done to meet the hunter’s requests and fitness. Great attention is paid to detail.

Hunting guides (HG) are permitted to hunt on their own farms only, whereas master hunting guides (MHG) may hunt on their farm and two additional farms where the hunting rights are registered in his name. Professional hunters (PH) may hunt on any farm, provided the consent of the owner has been obtained. There are presently about 470 HGs, MHGs and PHs registered with NAPHA. 17 PH, 25 MHG and 38 HG have permanent addresses within the northwest.

Currently, the trophy hunting industry is said to be worth N$ 100 million per year.
6.8.2 PRODUCT PROFILE – COMMUNAL LAND

As mentioned previously wildlife numbers have increased dramatically in some parts of the focus area. These areas are unfenced, scenically beautiful, have big game including elephant and rhino and have in effect not been utilised for trophy hunting for the last 15 years. Registered conservancies are the only institution (other than MET) that can enter into legal hunting contracts at present. This gives the same measure of control held on the commercial farms to the communal areas. The two registered conservancies in the project area have been awarded trophy hunting and utilisation quotas by the MET for 1999. Both have signed contracts for 1999 to the combined value of approximately NS200 000.

The area is well renowned for its outstanding scenery, quality trophy sizes for plains game, and the challenging hunting conditions provided by the rough environment. Table 6.7 gives a comparison of trophy quality between the commercial Outjo/Karibib Districts and the communal areas. Data was collected by the MET during the communal hunting seasons of 1991 and 1995 at two locations. Animals were not selected for trophy quality. Trophy quality is very high for the two species analysed, satisfying both SCI and Roland Ward criteria.

Table 6.7: Trophy Quality - Safari Club International (SCI) / Roland Ward (RW)

<table>
<thead>
<tr>
<th>SCI Standards</th>
<th>Springbok</th>
<th>Gemsbok</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Max (cm)</td>
<td>Ave (cm)</td>
</tr>
<tr>
<td>1st Outjo district</td>
<td>104.50</td>
<td>93.0</td>
</tr>
<tr>
<td>1st Karibib district</td>
<td>-</td>
<td>96.9</td>
</tr>
<tr>
<td>2nd 1991/95 communal hunting seasons (Kunene Region)</td>
<td>114.10</td>
<td>99.0</td>
</tr>
<tr>
<td>SCI minimum</td>
<td>- 96.5</td>
<td>- 0</td>
</tr>
<tr>
<td>Namibian minimum</td>
<td>- 87.0</td>
<td>- 0</td>
</tr>
<tr>
<td>RW STANDARDS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1991/95 communal hunting season (Kunene Region)</td>
<td>43.70</td>
<td>-</td>
</tr>
<tr>
<td>RW minimum</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1* Trophy hunting on commercial farms  
2* Random hunting during communal game harvest  

*Source: Mick De Jaager (personal communication, Ministry of Environment and Tourism, 1999)*

Products offered here are often not available on private land. This sector is set for growth particularly in the upmarket and/or adventure safaris. Links with the private sector in developing this are crucial.

6.9 COMMUNITY PARTICIPATION IN WILDLIFE AND TOURISM

The active involvement of local communities in the conservation of wildlife, including elephant and black rhino, is well documented and considered a point of departure. These communal areas are the only in Africa to have free roaming populations of black rhino. Prior to conservancies, community involvement in wildlife was structured through the Community Game Guard (CGG) system. This system is primarily NGO funded, and brings about a partnership between the MET, communities and NGOs. Tourism development control was mainly through the MET with input from the Traditional and Regional Authorities. Thorough community consultation was not undertaken. No control was afforded to local communities in the awarding of tourism and trophy hunting concessions and little consultation with local communities was done in general.

Benefits from tourism concessions were initially limited to jobs. This situation created hostility between the local community, concession holders/operators and the MET. This resulted in some concession holders negotiating with and later paying bed night levies to the surrounding communities. The first of these operators in the region were Skeleton Coast Fly in Safaris and Etendeka Mountain Camp. This improved the situation and has set a crucial president for future relations.

Tourism concessions issued before the registration of conservancies are still valid and all concessionaires are willing to negotiate with conservancies for future contracts. Palmwag Lodge, Etendeka and Hobatere have started with these negotiations. Good co-operation between surrounding farmers and tourism establishments has proved to be mutually beneficial. Results of this have been seen at Etendeka Mountain Camp and Damaraland Camp situation where relations and communication with neighbouring farmers has improved. This has been more effective in the Damaraland Camp, which has a joint venture with the conservancy committee which is a legal representative body
(Torra Conservancy Committee). A Joint Management Committee (JMC) takes up issues with the community and the camp in order to minimise disturbance to the operation. The payment of a bed night levy or benefits generated through a joint venture agreement have provided incentives for both parties to manage the operation. The support of the local leadership has also been more easily obtained with this approach.

Skeleton Coast Fly In Safaris is presently negotiating with Torra conservancy to formalise their operations in this conservancy. Ehirovipuka is presently negotiating with a tour operator to establish a joint venture along similar lines to the Torra agreement with Wilderness Safaris Namibia. Wilderness Safaris Namibia has acquired use of the Skeleton Coast Park Concession, and are interested in negotiating with the Purros conservancy concerning trips inland.

The MET developed the conservancy approach to devolve responsibility to locally representative committees, which hold legal status and be accountable and transparent to their communities in their dealings with wildlife and tourism related activities. This legislation is amongst the most innovative in Africa. The traditional authorities are encouraged to participate in these committees, but like other conservancy members, will be required to act in accordance with the constitution, which is endorsed by the members of the conservancy.

Conservancies are legally required by MET to be audited annually, to have an equitable distribution plan for benefits distribution and a conservancy / wildlife management plan. Members are registered according to criteria identified by the community, generally having to be Namibian citizens, permanent residents of the area and older than 18 years and willing to abide by the rules of the conservancy.

Communities have responded positively to this legislation, with five conservancies already registered in the Kunene Region and more than ten in the formative stages in the focus area (see Map 606). Almost 15 000km² (or 20% of the Kunene Region) is registered as communal land conservancies.

- The #Khoadi //Hoas (Grootberg/"Elephants Corner") Conservancy was among the first four conservancies to be registered (February 1998). This conservancy has approximately 800 members. This is one of the ten registered conservancies in Namibia and one of the five registered in Kunene Region. The conservancy has a management and land use plan and elected Environmental Shepherds who are proving effective. This is the only conservancy in the Kunene Region at present which has incorporated wildlife management into broader resource management. The conservancy committee have signed a trophy-hunting contract for 1999/2000 and are busy negotiating with Steve Braine of Hobatere Lodge/ concession area to have this
area included in their conservancy. A detailed tourism plan for the conservancy has been completed under the supervision of NACOBTA.

- **The Torra Conservancy** was also registered with the first four conservancies in June 1998. Torra also has an effective Community Game Guard (CGG) system in place. In terms of wildlife monitoring, they are utilising geo-referenced sightings for casual and fixed route, vehicle and foot patrols. Records from these patrols are entered into a database to allow analysis of population trends over time, which will assist in setting quotas for utilisation. Patrols have also been effective in controlling illegal hunting, which at present is done primarily by non-members of the conservancy who are temporarily resident for grazing or other reasons.

Torra has a joint venture with Wildemess Safaris Namibia (WSN), which has been operational for three and a half years. An area has been made available for the operation. Farming practises carry on unhindered in this area, but no other tourism ventures will be allocated by the conservancy without WSN consent. The project is managed by a Joint Management Committee (JMC), comprising the conservancy committee members and senior WSN staff. Day to day management is the responsibility of WSN appointed staff, but training of local staff for management positions is a major component of the joint venture agreement. This operation is very successful and in the first year of operation came second in an international award for eco-tourism, the Silver Otter Award.

Torra has recently developed an equitable distribution plan for the use of funds generated by the conservancy. To date income has primarily been utilised for the payment of community game guards and field officer and related logistic costs. Permission to Occupy (PTO) costs have also been paid by this fund. This is part of a phased take-over of all conservancy running costs by the conservancy from it supporting donor. At present the conservancy pays for over 80% of its running costs per annum. The remainder is funded from an NGO source. Other land use planning is underway but is still in a provisional stage. A wildlife management plan is being drafted.

Torra has also signed a trophy hunting agreement for 1999, which includes the training of several conservancy members in hunting support services and over the long term, in hunting itself. Conditions of hunting are agreed in the contract and includes specified hunting areas, the distribution of meat and requirements such as the need for a CGG or Field Officer to accompany all hunts.

- **The Doro Nawas Conservancy** was registered in December 1999
• The Uibasen (Twyfelfontein) Conservancy was registered in December 1999. Several tourism ventures have been started in the area including one joint venture tourism operation between the conservancy and private investors. Uibasen and Doro Inawas have agreed to the joint management of about 180 km².

• The Omburo (Purros) Conservancy has elected a committee and completed all requirements as laid out by the MET. The application has been approved and gazetted by the MET (May 2000).

• The Marienfluss Conservancy, including the Hartmann’s Valley, has completed all the necessary steps to register as a conservancy. The application has been passed by the Regional Council and is awaiting MET approval.

• The Onjuva (Orupembe) Conservancy has finalised its boundaries and is in the formative stages of conservancy establishment.

• The Sanitatas Conservancy has finalised its boundaries and is in the formative stages of conservancy establishment.

• The Sesfontein Conservancy, made up of a number of communities, has been struggling for more than three years to form a conservancy. All the conditions as laid out by the MET have been met and the application was approved by the Governor of the Kunene Region and Regional MET office in May 1999. The MET technical committee has not passed the application. Sesfontein has a detailed land use plan which was done in consultation with the community and co-ordinated by the Ministry of Agriculture, Water and Rural Development. The core wildlife area has been rezoned and is presently being negotiated with the MET, Desert Adventure Safaris (Palmwag) and the Sesfontein Conservancy Committee. These zones still need the approval of all parties including the conservancy members. The aim is to allow the concassion area (Palmwag) to be included in the Sesfontein conservancy. The zones within the proposed conservancy are:

  ✓ Two exclusive photographic tourism areas, one including the Hoanib River and the other in the south of the concession. No hunting activities will be allowed to take place in these areas.
  ✓ A wildlife management area which would include trophy hunting areas, mixed livestock and wildlife areas and where cropping of wildlife will take place.
  ✓ A non-hunting, mixed stock, wildlife and tourism area, including the Khowarab Schlucht.

An environmental education centre area has been planned as well as a potential safari hunting camp. These negotiations have been stalled by the non-registration of
the conservancy and in the process hundreds of thousands of dollars have been lost to this community.

- The Tsiseb Conservancy (formerly Daures) has negotiated provisional boundaries and is nearing completion of the steps in conservancy formation.

- The //Huab (Frasnsfontein) Conservancy has met several of the requirements of conservancy formation, including boundary negotiations.

- The Omatendeka Conservancy has fulfilled most of the requirements but continues to be delayed by boundary disputes.

- The Ehirovipuka Conservancy has met the requirements as laid out by the MET for approval from the Regional Governor, local and head office MET officials. This community has requested access to western Etosha National Park area, for many years for tourism development. Discussions have been held with the Director of MET in this regard and it has been suggested that a conservancy should first be registered before negotiations can proceed. The application is with the MET awaiting approval.

- The Anichab Conservancy is in the early stages of conservancy formation.

- The Otuzemba, Ombombo and Otjapitjapi conservancies in the north east of the study area are all in the initial stages of conservancy formation.

- Other communities not marked on Map 606 as emerging conservancies should not be considered an indication of their lack of interest. Many requests for assistance have been received both by the MET and other NGOs, but a lack of capacity by these agencies has prevented assistance being given. Yet, those marked on the map are those identified to have made considerable progress in meeting the requirements as set out by the MET. Plans are underway by a recently formed national community-based natural resource management collaborative group, CAN (CBNRM Association of Namibia) to increase capacity to further assist communities in conservancy formation.
7. EXISTING INSTITUTIONS AND MANAGEMENT STRUCTURES

This chapter contains a brief overview of existing institutions and their roles in terms of wildlife and tourism and to some extent land use planning.

7.1 COMMUNITY BASED ORGANISATIONS (CBOS)

A number of these local institutions exist.

7.1.1 Conservancy Committees (Existing And Emerging)

With legal status to manage, use and benefit from wildlife and tourism in their specified area, Conservancy Committees are important local management units. See details under chapter 4.

7.1.2 Farmers Unions

For example, in the Kunene Region there are 7 different Farmers Associations which form the Welwitschia Farmers Union. (one of these being the Grootberg Farmers Association)

7.1.3 The Kaoko – Epupa Development Foundation

This CBO was launched by the Himba community as a non-profit making association to deal with the development issues relating to the Himba people by the Himba people.

7.2 NON GOVERNMENT ORGANISATIONS

A number of NGOs operate in both the Erongo and Kunene Regions.

7.2.1 Agrifutura

Agrifutura has provided support to community tourism enterprises such as the community campsite at Spitzkoppe and Etanga campsite.

7.2.2 Brandberg Trust

The Brandberg Trust is presently negotiating with the national Monuments Council for the joint management of the Brandberg.
7.2.3 Desert Research Foundation of Namibia (DRFN)

The DRFN is involved in the area through its role in the Namibian Programme to Combat Desertification (NAPCOD). This and other projects such as the Hoanib River Catchment study have an important part to play in terms of providing information to decision-makers, including and especially environmental aspects related to tourism development. It is also involved in environmental research of the Hoanib catchment.

7.2.4 Integrated Rural Development and Nature Conservation (IRDNC)

This NGO is primarily involved with community - based conservation and tourism. Financial, logistic and technical support is given to emerging and registered conservancies and community tourism enterprise development. Capacity building and training of local institutions to become effective management bodies and community game guards to become effective managers of resources, particularly wildlife is a focus. The focus area is largely north of the veterinary fence in the Kunene Region.

7.2.5 Living In a Finite Environment (LIFE)

The LIFE programme is giving support to the #Khoati //Hoas conservancy through training and technical advise and grants to RISE. Some other training activities are undertaken in partnership with IRDNC.

7.2.6 Legal Assistance Centre (LAC)

The LAC provides legal advice to a number of interest groups in the northwest. In particular, legal advice related to human rights issues and legal contracts and documents is given. A paralegal advisor and an office have been established in Opuwo to cope with increasing demand on the LAC's resources. Particular advice and mediation has been provided to emerging and established conservancies in the project area.

7.2.7 Namibian Community Based Tourism Association (NACOBTA)

This organisation is providing support to the MET and local community based tourism enterprises, conservancies and entrepreneurs. This support is in the form of technical advise, logistic support, training and through a small grants scheme. They are also key stakeholders in projects such as the North-West Tourism Master Plan and follow up activities to it.
7.2.8 Namibia Nature Foundation (NNF)

The NNF has taken on the responsibility of administering the finances of CAN (CBNRM Association of Namibia) and will also be administering small grant facilities for CBCOs. The NNF currently provide financial administration services and fund-raising support to a number of projects in the project area.

7.2.9 Namibian Non Government Organisation Forum (NANGOF)

NANGOF have taken responsibility for the secretariat of CAN. They are presently advertising for a co-ordinator post.

7.2.10 RISE

RISE has joined CAN and is facilitating conservancy establishment in the southern Kunene Region and Erongo region, (e.g. Fransfontein, Doro Nawas, Tswate and Uibasin). They are providing both technical and financial support to these conservancies.

7.2.11 Rosing Foundation

This organisation has provided technical support and training to a number of community craft projects such as the Daureb Crafts in Uis, Khorixas Craft Centre and to craft makers in the Marienfluss. They are also working in partnership with IRDNC and local conservancies in conservancy institutional capacity building.

7.2.12 Save the Rhino Trust (SRT)

This NGO is mainly involved in extensive rhino monitoring of the black rhino populations in both regions. This is done in participation with local community trackers and staff and in collaboration with MET. The SRT is also involved in support to some local community run tourism enterprises as well as its own "Bicomis Safaris" rhino tracking tours and camel tours.

7.3 LOCAL GOVERNMENT INSTITUTIONS

7.3.1 REGIONAL COUNCILS

Working according to the Regional Council Act 1992, the Regional Councils are managed and co-ordinated through the Ministry of Local and Regional
Government and Housing. This legislation allocates the control over natural resources including land in rural areas to fall under the jurisdiction of the Regional Councils.

The Regional Councils (RC) have the responsibility and authority to plan for their regions in terms of geographic, physical, social and economic development. This involves the drawing up regional development plans and coordinating development projects in the regions. However it is recognised that the RC do not have the financial or manpower capacity to develop these plans, and hence they are done by the MLRR with the involvement of the RC.

In implementing the government policy of decentralisation, the role of the Regional Council should be strengthened and a greater co-ordination role played.

7.3.2 Local Authorities

This is the second type of local government authority. Local Authorities deal with local planning in three types of areas, municipalities, towns and villages.

7.3.3 Traditional Authorities

Now regulated by the Traditional Authorities Act of 1998. In terms of tourism, Traditional Authorities are required to give support to applications for PTOs. This process is however due to come under review and the mandate of conservancies clarified in respect to PTO recommendation. Traditional authorities should be involved and consulted particularly in respect to land allocation decisions. Clear indication of their roles is given in the Traditional Authorities ACT.

7.4 LINE MINISTRIES

7.4.1 MINISTRY OF ENVIRONMENT AND TOURISM (MET)

The MET is the lead ministry for tourism in Namibia. As laid out in the First National Development Plan (FNDP1) the role of the government is:

"...to enable and facilitate the development of the tourism sector. It co-ordinates inter-ministerial activities relevant to tourism, co-operates with the private sector to create a national tourism identity, passes enabling legislation for the sector, provides development guidelines and monitors development trends."
Specifically, the main task of the MET is to see to the sustainable conservation of the environment and natural resources based on sustainable development, clearly making it the function of the MET to see to this in terms of tourism and wildlife management. In terms of tourism, role of the MET is specified as to:

"...create an enabling environment for the industry through a combination of product development and marketing efforts with sensitive control of tourist numbers at specific locations."

This is achieved through a number of policies and enabling legislation, including those that transfer rights and responsibilities to communities living with the wildlife resources.

7.4.2 MINISTRY OF LAND, RESETTLEMENT AND REHABILITATION (MLRR)

This ministry is important in terms of tourism and land use planning, since it is in charge of land use planning and administration in rural areas. The MLRR has this responsibility and authority as it is the custodian of state land.

The role of MLRR includes the development of multi-sectoral land use plans (as done for the Kunene Region 1998). In addition the MLRR focuses on land reform issues and will administer the Communal Land Act.

7.4.3 MINISTRY OF LOCAL AND REGIONAL GOVERNMENT AND HOUSING (MLRGH)

Since the management and co-ordination of the Regional Councils falls under the MLRGH, they will be co-ordinating regional planning efforts with the RC. Spatial and land use planning also falls under the guidance of MLRGH as does development planning for the regions. The regional development plans will be based on land use plans (and other plans) so there is a need for close cooperation between agencies involved in regional planning. The Directorate of Community Development gives support to a number of community run campsites in the study area (both technical and financial).

7.4.4 MINISTRY OF AGRICULTURE, WATER AND RURAL DEVELOPMENT (MAWRD)

MAWRD have an interest at looking at land use and planning from a perspective of optimising land use for agricultural production. As the livelihoods of many of the residents of the Kunene and Erongo regions depend on farming...
activities, close co-ordination and collaboration with MAWRD is important in regional land use planning. In an area such as the north-west, wildlife and stock both use and impact on water and grazing resources. Careful planning to zone these forms of utilisation is important in this study.

7.4.5 MINISTRY OF MINES AND ENERGY

As mining operations can have negative impacts on tourism, the activities and mandates of this ministry needs to be taken into consideration in tourism planning. The MME should be kept informed of tourism developments and plans to avoid conflicts in land use zoning.

7.4.6 MINISTRY OF WORKS, TRANSPORT AND COMMUNICATION (MWTC)

Infrastructure in terms of communication and other facilities are vital for the operation of the tourism industry (such as roads). Consultation with MWTC is important. This sector needs awareness creation and control over the sitting of gravel pits, which in many cases distract from the tourism appeal of the area.

7.4.7 NATIONAL MONUMENTS COUNCIL

Under the Ministry of Basic Education and Culture they are responsible for the maintenance of Namibia’s national monuments but have severe budgetary constraints.

7.4.8 NATIONAL PLANNING COMMISSION (NPC)

The NPC co-ordinates all national development programmes and directs national planning.

As has been noted in numerous studies reports and projects, including a meeting of the collaborative group for CBNRM in Namibian 1998, a major problem was identified as the poor co-ordination and communication between line ministries themselves and between NGOs and government. This shortcoming has resulted in much conflict and confusion. CAN hopes that as part of its objectives, it will be able to improve this situation.
8. WATER RESOURCES OF THE REGION

8.1 INTRODUCTION

The term "water resources" refers to the natural water resources, whether they have been developed or not. These resources include perennial and ephemeral rivers, aquifers and springs. The Kunene Region is bordered in the north by the Kunene River, which is monitored by the Hydrology Division in the Department of Water Affairs. Within the interior, there are a number of ephemeral rivers, some of which have been investigated in some detail and some about which very little is known.

8.2 PERENNIAL RIVERS

The Kunene River rises in Southern Angola to the west of the Kubango River, with the headwaters lying at elevations of between 1700 and 2000m. The total catchment area is 106 500km², of which 14 100km² lies within Namibian territory. In the upper reaches, the main channel is well-defined with a number of rapids and steep sections. As the river gets closer to the Namibian border, however, the nature of the river changes drastically as it flows over Kalahari sands with a small gradient. Only the eastern bank is at all well-defined, with wide flood plains on the western bank. From Calueque to the coast, a distance of just under 385km, the river drops nearly 1200m including several spectacular falls. Although there are a number of tributaries in the southern part of the catchment, the large majority of the runoff is generated from rain falling between October and March over the highlands in Angola. In view of the fact that much of the catchment lies in the western part of Angola, where rainfall is relatively unreliable, there is a large difference between good and bad years. Flows in the Kunene River are usually close to zero by the end of the dry season. With the inception of the Ruacana hydro-electric scheme and its associated storage dams further upstream, flows in the downstream reaches should have become more regulated. However, this has not really been the case due to the fact that the main regulating dam at Gove in Angola has never been fully operational.

Figure 8.1 shows the average, minimum and maximum hydrographs for the Kunene River at Ruacana. The graphs show clearly that the mean flow patterns are much closer to the minimum on record than to the maximum.

Figure 8.2 shows the annual runoff values as recorded or estimated for the Kunene River since 1933/34. Once again, the graph shows the huge difference between low and high flow years. While it is clear that flows in the Kunene River have been below
average over the past ten years, Figure 8.2 shows that similar dry periods have occurred in the past.

Figure 8.1: Mean, Maximum Minimum Hydrographs for the Kunene River at Ruacana

Figure 8.2: Annual Runoff Totals in the Kunene River at Ruacana

In 1969, South Africa and Portugal, as the colonial powers in Namibia and Angola respectively, established the Permanent Joint Technical Commission (PJTC) to deal with matters relating to the Kunene River. In 1991, the two independent governments of Namibia and Angola cemented this co-operation by ratifying the 1969 agreement on the Kunene River and indeed the 1969 "Master Plan of the Cunene River" was accepted as a general official guideline for development of the river. It was, however, agreed that this plan was mainly technical and focused little on environmental matters. The PJTC has been very active in recent years, not least because of the Epupa Dam Hydro-electric Scheme feasibility study.
The Kunene River is an important water supply source for the relatively densely populated central northern areas of Namibia. Water is piped from the Calueque Dam near Ruacana, or from Ruacana itself via Oongo to Oshakati and other parts of the Oshana, Omusati, Ohangwena and Oshikoto Regions. Following discussions with Angola, Namibia has access to an agreed allocation of 190Mm³/annum which is more than double current consumption.

8.3 EPHEMERAL RIVERS

8.3.1 GENERAL OVERVIEW

The surface water resources of the region are best described in two key reference documents, “Unit Runoff Map for Namibia (Chivell and Crerar, 1993), and “Hydrology of the Kunene Region” (Van Langenhove et al, 1992). Figure 8.3 shows the unit runoff values for the Kunene and Erongo Regions as provided in the Unit Runoff Map. The term “unit runoff” can be defined as the depth of precipitation per unit area that contributes to runoff. For most water resource applications, the long-term average annual unit runoff is used, and for any given catchment this can be calculated by dividing the long-term mean annual runoff (mean annual runoff) by the catchment area (A).

The catchments of the Kunene and Erongo regions are discussed in detail in paragraph 8.3.4. Prior to discussion of the individual basins, the two regions and the general availability of data are discussed in paragraphs 8.3.2. and 8.3.3.

8.3.2 THE KUNENE REGION

While there are currently no concrete plans to build surface water storage dams in the region, a recent study (1992) did look at the potential of a considerable number of dam sites throughout the Kunene Region. The potential dams would be for use as part of proposed irrigation schemes. The locations of all dam sites are shown in Figure 8.4. The potential safe yields of these dams have been calculated and are shown in Table 8.1. It is important to note that these yields are calculated independently of the effect on groundwater resources. It is clear that the construction of any significantly-sized dam can have a negative effect on the downstream environment and groundwater. In the discussion of the individual basins, some comments on the size and sustainability of the catchments' water resources has been made. The figures in Table 8.1 should be considered in conjunction with these comments.
Not included in the Table is the Sebraskop Dam on the Ugab River which is on the border of Kunene and Erongo Regions. (Details are included in Paragraph 8.3.4.9.)

Figure 8.5 shows the distribution and details of the gauging stations in Namibia. While there may appear to be a large number of ephemeral flow gauging stations in the Kunene Region, the quality of the calculated runoff data is generally poor.
Figure 8.3

Unit Runoff Map of Namibia

LEGEND
Unit Runoff (mm)

LOW 1

MILD 2

MODERATE 2.5

STRONG 3

STRENGTH 4

SEVERE 5

EXTREME 6

DISASTER 7

EXTREME 8

UNUSUAL 9

WANT 10

UNUSUAL 12

EXTREMELY 15

RARE 20

OCASIONAL 25

INFREQUENT 30

MINISTRY OF ENVIRONMENT AND TOURISM

URBAN DYNAMICS
TOWN AND REGIONAL PLANNERS

Prepared by Windhoek Consulting Engineers
Figure 8.4: Location of Potential Dam Sites in the Kunene Region
<table>
<thead>
<tr>
<th>Site Name</th>
<th>Dam Capacity (Mm$^3$)</th>
<th>95% Safe Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sesfontein Main Dam Site 1 (no silt dam)</td>
<td>40</td>
<td>2.4</td>
</tr>
<tr>
<td>Sesfontein Main Dam Site 1 (silt dam)</td>
<td>40</td>
<td>2.7</td>
</tr>
<tr>
<td>Sesfontein Main Dam Site 2 (no silt dam)</td>
<td>40</td>
<td>2.7</td>
</tr>
<tr>
<td>Sesfontein Main Dam Site 2 (silt dam)</td>
<td>40</td>
<td>2.7</td>
</tr>
<tr>
<td>Khowarib Main Dam (no silt dam)</td>
<td>40</td>
<td>3.0</td>
</tr>
<tr>
<td>Khowarib Main Dam (silt dam)</td>
<td>40</td>
<td>3.3</td>
</tr>
<tr>
<td>Otjitaumo Site 1</td>
<td>5</td>
<td>0.1</td>
</tr>
<tr>
<td>Otjitaumo Site 2</td>
<td>5</td>
<td>0.1</td>
</tr>
<tr>
<td>Tomakas Site 1</td>
<td>10</td>
<td>1.0</td>
</tr>
<tr>
<td>Tomakas Site 2</td>
<td>10</td>
<td>0.8</td>
</tr>
<tr>
<td>Upper Purros</td>
<td>80</td>
<td>11.7</td>
</tr>
<tr>
<td>Lower Purros</td>
<td>80</td>
<td>14.7</td>
</tr>
<tr>
<td>Upper Purros Tributary</td>
<td>10</td>
<td>0.1</td>
</tr>
<tr>
<td>Opuwo</td>
<td>15</td>
<td>0.2</td>
</tr>
<tr>
<td>Okonguati Site 1</td>
<td>20</td>
<td>0.4</td>
</tr>
<tr>
<td>Okonguati Site 2</td>
<td>20</td>
<td>1.9</td>
</tr>
<tr>
<td>Otjitanga</td>
<td>20</td>
<td>1.7</td>
</tr>
<tr>
<td>Ondoto</td>
<td>20</td>
<td>2.4</td>
</tr>
</tbody>
</table>

It is important to note the meaning of 95% safe yield. The word “safe” here has nothing whatsoever to do with environmentally safe or sustainable. The term simply means that the dam would be able to supply the given yield 95% of the time. During the other 5% of the time the yield would be less than this.
8.3.3 THE ERONGO REGION

The locations of runoff gauging stations in the region are shown in Figure 8.5. Compared to some other parts of the country, many of the catchments have been relatively intensively investigated usually with possible development of dam sites in mind. In fact, one of the rivers flowing through the region, the Swakop River has two large dams and two medium-sized dams in the catchment, which have reduced flow substantially. Some of the ephemeral rivers of the Erongo Region were investigated and summarised by Crerar (1994) in a report compiled for the Central Namib Area Water Supply Feasibility Study. This study discussed the water supply potential of a number of dam sites which had been considered over the years, and also looked at the potential of recharge dams as well.

8.3.4 ANALYSIS OF INDIVIDUAL BASINS

8.3.4.1 INTRODUCTION

In the following paragraphs (8.3.4.2 to 8.3.4.12) the individual catchments which make up the water resource base of the North-west region are discussed in terms of the following:

- General characteristics.
- Data available.
- Water resources.
- Water resource development.
- Possible impacts of developments.

The development of water resources is discussed in terms of existing state water schemes, rural water supply, and potential developments. A cursory discussion, where appropriate, of the possible impacts of potential developments is also considered.

8.3.4.2 UNSPECIFIED EPHEMERAL TRIBUTARIES OF THE KUNENE

There are a number of ephemeral tributaries of the Kunene with significant runoff potential. Three of these, with their sources in the Baines Mountains, have been investigated for surface water dams. They are (from west to east), the Omuhongo, Otjitango and Ondoto Rivers which all flow northwards to the Kunene. The mean annual runoff of the Ondoto River is estimated at 13.2Mm³/a, and of the Otjitanga at 9.3Mm³/a. Mean annual runoff of the Omuhongo is a little less. Further to the west, the tributaries to the Kunene and
those which flow directly across the desert to the sea have their origins in areas of much lower rainfall and runoff potential. It is unlikely that these systems have significant spare capacity. All occasional floods are fully utilized in fulfilling ecological demands.

8.3.4.3 KHUMIB RIVER

**General**

The majority of the Khumib River catchment lies within an area of relatively low runoff potential, unit runoff being 3mm or less. The area with highest potential and greatest frequency of flow is to the north-east of Onupembe. The Khumib is one of a number of relatively small desert rivers (catchment area of 2 200km²) lying to the north of the Hoarusib River and has the most regular flow, occasionally reaching the sea. It is estimated that the number of people living in the catchment at any one time is in the order of one hundred.

**Data**

There are no rainfall or runoff gauging stations in the catchment. There are very little useful data on both surface runoff resources and groundwater for the catchment.

**Water Resources**

The catchment contains several springs which are important to wildlife, including the Sanduus Spring only 10km from the sea. The prevalence of springs, however, should be seen as a reflection of the low level of development in the catchment. The drilling of boreholes and abstraction of significant quantities of water would probably adversely affect these springs relatively quickly.

**Water Resources Development**

There are no bulk water extraction schemes in the catchment. The potential for development is very limited. Even small abstraction schemes for tourist facilities would have to be implemented with care.
8.3.4.4 HOARUSIB RIVER

General

The Hoarusib River is one of the major westward-flowing rivers, and flows to the sea almost every year. Rainfall in the mountainous headwaters averages over 300mm per annum. Although it is a sparsely populated area in general, it does include the regional capital of Opuwo in its headwaters. The river supports several large wetlands, especially in its downstream reaches, a riparian forest, and its also provides a lifeline for large numbers of wildlife.

Data

A number of runoff gauging stations are operated by the Department of Water Affairs along the length of this river from close to Opuwo right down to the coast. Although the remoteness of these stations makes it difficult to collect accurate data on every flood event, the Department has managed to derive acceptable estimates of the key hydrological parameters.

Water Resources

The mean annual runoff of the Hoarusib is probably at its maximum in the area of lower Purros, which is downstream of all of the major confluences. At this point the value is approximately 47Mm³/a. The median annual runoff is about half of this, which is a reflection of the regularity of flow. There are many springs, especially in the lower reaches.

Water Resource Development

The possibility of damming the Hoarusib River has been seriously considered by the Department of Water Affairs. Two dam sites at Purros, as well as on tributaries have been investigated.

The two alternatives at Purros could be major dams and would offer significant yields for both human consumption and for irrigation. There are large areas of irrigable soil in the area and this development is being considered. Even a dam with a capacity equal to the mean annual runoff would yield approximately 13Mm³/a for irrigation or 6.5Mm³/a for human consumption where the assuredness of supply must be higher. The sites on the tributaries, one close to 87
Opwwo and another close to Purros offer limited possibilities for water resource development.

The possibility of recharge enhancement has not been seriously considered in the Hoarusib catchment. The potential of recharge enhancement would depend upon the availability of aquifer storage but may offer bulk water supply options which would have lesser impact on the environment than an open-water dam.

**Possible Impacts of Developments**

The 1992 investigations into dam sites did identify the fact that the Hoarusib River sustains much of the fragile ecology of the Skeleton Coast Park, and that the environmental impact would have to be assessed. It was also stated that there are potential mining developments in the area which would compete for the water. While it is probable that the considerable resources of the Hoarusib River could support a degree of development, it is hard to imagine it not having a negative impact on the downstream environment. As already stated, the combination of a large dam with a recharge enhancement scheme may represent a feasible option.

**8.3.4.5 HOANIB RIVER**

**General**

The Hoanib River has a catchment area of 17 200km², which although larger than the Hoarusib to the north, has a much lower runoff potential. Mean annual precipitation is as high as 320mm in the headwaters. The main town in the basin is Sesfontein.

**Data**

There are only two active and reliable rain gauges in the entire catchment, and five runoff gauging stations at strategically chosen sites.

**Water Resources**

The main runoff producing part of the river rises in the mountainous north-east of the catchment where unit runoff is up to 6mm, but there are also a number of important tributaries coming from the flatter south-west with lower unit runoff potential (3 – 4mm). Sesfontein, where the mean annual runoff is estimated at
13.5Mm³/a, is well-known for its many springs, gardens and large herds of livestock. The runoff potential of the river is clearly considerably lower than that of the Hoarusib, although there is an abundance of springs in the mountains. Nearer the coast, more springs, wetlands and a large floodplain support a variety of wildlife including elephants. 91% of the basin is in communally-owned land, 3% is privately-owned, and the remaining 6% falls within the Skeleton Coast Park.

**Water Resource Development**

There are bulk water schemes to be found at Erwee, Otjovansandu and Sesfontein. The total population living in the basin is estimated at 7 900. Dams at Sesfontein, and at many other sites have been considered. It is clear that any major dam on the mainstream will have a significant effect on the river environment downstream. Any major development of this type would require a thorough environmental impact assessment.

**Possible Impacts of Development**

The 1992, investigations into dam sites identified the fact that the Hoanib River sustains much of the fragile ecology of the Skeleton Coast Park, and that the environmental impact would have to be assessed. It was also stated that there are potential mining developments in the area which would compete for the water. While it is probable that the considerable resources of the Hoanib River could support a degree of development, it is hard to imagine such development not having a negative impact on the downstream environment.

**8.3.4.6 UNIAB RIVER**

**General**

This small desert catchment lies entirely within an area which receives less than 125mm of rain per annum. The catchment drains the red volcanic rocks of the Grootberg Mountains, and flows are relatively infrequent.

**Data**

An absence of any gauging stations on the river means that only estimates of mean and median annual runoff are possible.
Water Resources

Although flows in the river are relatively infrequent, there are a number of springs which support migratory wildlife including elephant and rhinoceros. There are several tourist concessions within the catchment. There are no significant settlements within the catchment and the total permanent population is approximately one hundred. It is estimated that for almost all of the catchment, the unit runoff is less than 1mm, and that the mean annual runoff is approximately 2.5Mm³/annum.

Water Resource Development

There is one bulk water scheme on the Unlab River which is used to supply water to Terrace Bay. The potential for further development is limited. Abstraction of water for small settlements and tourist developments should be done with due regard to the sensitivity of this river's desert environment.

8.3.4.7 KOIGAB RIVER

General

Like its northern neighbour, the Kuyab River drains from the volcanic lavas of the Grootberg Mountains. Rainfall over the whole of the catchment is very low.

Data

There is only one known active rain gauge in the catchment and no river gauging stations.

Water Resources

Although rainfall over the catchment is low with mean annual precipitation of 100mm over the headwaters, and floods are rare, there are a number of springs and wetlands, which support a variety of wildlife. The mean annual runoff is estimated at 1.5Mm³

Water resource Development

There is a bulk water scheme at Bergsig, which is the only settlement, but the total population living within the catchment is probably less than one hundred.
Possible Impacts of Development

Agricultural possibilities in this catchment are limited. Tourism is becoming the mainstay of this area.

8.3.4.8 HUAB RIVER

General

The Huab River rises in the mountains to the south-east of Kamanjab in an area where mean annual precipitation is over 350mm. This large catchment supports a number of sizeable settlements including the towns of Khorixas and Kamanjab, and several other smaller settlements.

Data

Although there are several rain gauges in the catchment most of these are in the eastern part of the catchment. As with the other desert catchments, there is a need for data from the desert areas. Although the river and its tributaries are gauged at six different locations, most records are either short or have serious breaks in the record.

Water Resources

The maximum mean annual runoff of the Huab River is approximately 28Mm³/yannum, and the median is half of this. There are a significant number of farm dams in the privately-owned part of the catchment and it has been suggested that this number has grown steadily over the years. This may have led to a reduction in runoff from the upper tributaries. It is certainly true that the number of springs in the downstream reaches has reduced in recent years. There is a particular need for land use planning in this catchment in order to tackle this type of problem. An indiscriminate increase in abstraction of groundwater may create further problems.

Water Resource Development

Four bulk water schemes are in operation drawing from the groundwater of the Huab, for Khorixas, Fransfontein, Kamanjab and Anker.
Possible Impacts of Development

The catchment has good potential for tourism development, but use of the water resources should be carefully planned for the expansion of this industry.

8.3.4.9 Ugab River

General

The Ugab River rises to the east of Outjo in an area with mean annual precipitation in excess of 450mm, but this flat area, much of which is covered by Kalahari sands, does not yield much runoff. The area of highest runoff potential is the area surrounding Kalkveld which feeds the Ozongomba tributary. The catchment area of the Sebraskop Dam site includes this area of higher runoff potential in its entirety. Little runoff is generated downstream of the Sebraskop Dam site.

Data

There are five runoff measurement stations currently operating in the Ugab River catchment. Petersburg gauging weir, which covers the upper 7 700km² of the catchment has a good record going back to 1961/62. The average unit runoff of this part of the catchment is however less than 1mm, so contribution to total flow in the Ugab River is relatively small. Further downstream is the Vingerklip gauging weir, which can be regarded as the master station for the Ugab River. This record dates back to 1967/68, and the stage to discharge rating has been checked with a number of current meter gaugings. It is the record of the Vingerklip station which has been used to synthesise the long record that was used for the Sebraskop Dam hydrological studies. There are two stations, both "open sections", further downstream, Onverwag and Ugab Slab, but the quality of their records makes them unsuitable for accurate quantitative analysis.

Water Resources

The surface water resources of the upper part of the Ugab catchment are small, with an area of 7 720km² yielding only 3.554Mm³/annum. The mean annual runoff increases substantially to nearly 21Mm³/annum at the Sebraskop Dam site. This is probably the hinge point on the Ugab River in that further downstream, losses to evaporation and infiltration will increasingly exceed tributary contributions.
Water Resources Development

- Open Dam

The possibility of a dam in the Ugab River at Sebraskop has been considered on a number of occasions. Runoff statistics for the Ugab River are summarised in Table 8.2.

**TABLE 8.2: RUNOFF STATISTICS FOR SEBRASKOP ON THE UGAB RIVER**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Observed</th>
<th>Combined Synthetic &amp; Observed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Annual Runoff (Mm³)</td>
<td>21.47</td>
<td>20.84</td>
</tr>
<tr>
<td>Standard Deviation (Mm³)</td>
<td>29.74</td>
<td>39.54</td>
</tr>
<tr>
<td>Coefficient of Variation</td>
<td>1.39</td>
<td>1.90</td>
</tr>
<tr>
<td>Median Annual Runoff (Mm³)</td>
<td>8.80</td>
<td>7.65</td>
</tr>
<tr>
<td>No. of Zero Flow Seasons</td>
<td>0</td>
<td>11</td>
</tr>
</tbody>
</table>

The storage draft analysis was carried out using a 1000 year record derived from the 68 year combined synthetic and observed record using a random selection technique. The 80% and 95% safe yields are summarised in Table 8.3 for two potential dam capacities.

**TABLE 8.3: EXPECTED YIELDS FROM A DAM AT SEBRASKOP ON THE UGAB RIVER**

<table>
<thead>
<tr>
<th>Reservoir Capacity</th>
<th>Yield with 80% Reliability (Mm³/a)</th>
<th>Yield with 95% Reliability (Mm³/a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>22.00</td>
<td>9.663</td>
<td>5.659</td>
</tr>
<tr>
<td>65.21</td>
<td>14.647</td>
<td>9.343</td>
</tr>
</tbody>
</table>

Although the yields are expressed in Mm³/annum, the calculations were carried out on a monthly basis. In both cases a zero initial storage and dead storage of 1Mm³ were assumed.

This would of course be a major water source, even with the smaller reservoir. Taking an average per capita consumption of 400 litres per day, which includes industrial and agricultural development, the given yield would provide water for 40 000 people.
• ARTIFICIAL RECHARGE

Artificial recharge from a potential dam further downstream has been mentioned in the past. In order to re-assess the potential yield of a recharge enhancement dam, the runoff record derived for the Sebraskop Dam has been routed the 25kms down to Onverwag and the recharge potential of a dam at Onverwag was then evaluated for dam capacities of 5, 10, 20 and 30Mm³/annum.

The analysis is based on several assumptions, the most significant of which is that there is sufficient aquifer storage for all the water available for recharge. This is not likely for the larger reservoir cases. In the case of a relatively small recharge dam of 22Mm³, which is the same size as one of the surface storage dams considered at Sebraskop, a firm recharge of 6.1Mm³/annum could be expected. This is not much higher than the 95 % reliable yield that can be expected from the conventional surface water dam, and is largely due to the excellent evaporation characteristics of the Sebraskop Dam site. In order for a recharge potential of 6.1Mm³/annum to be fully realised, the storage aquifer downstream of Onverwag would have to have an active storage of at least 25Mm³.

Possible Impacts Of Developments

Although significant runoff potential exists on the Ugab River both at the proposed Sebraskop Dam site and at Onverwag further downstream, the effects on the riverine environment downstream would clearly be very significant. The feasibility and sizing of Sebraskop Dam would certainly be largely dependant on environmental constraints. A large dam of 65Mm³ would yield only 3.474Mm³/a more than a dam less than a third of that size. It seems unlikely that this difference could be justified in view of the potential downstream effects.

In the 1995 study an attempt was also made to assess the impact of the Sebraskop Dam on flows reaching the Ugab Slab gauging station near the coast. It was found that the frequency of this occurrence would decrease from about 2 out of 3 years to 1 out of 4 for the 22Mm³ dam, and 1 out of 6 for the 65Mm³ dam.

As already stated, the feasibility of a recharge enhancement scheme at Onverwag is very dependant on available aquifer storage. Assuming that aquifer storage is available the advantages of the Onverwag site over Sebraskop may be as follows:
1. Marginally improved yield for the same reservoir capacity.
2. Downstream river reach affected by lower flow regime would be reduced by 25km.
3. Reduced need for water treatment/purification.
4. During years when full yield potential is not utilised, excess water will go to recharge, downstream flow, rather than evaporation.
5. Closer to coastal demand centres.

Disadvantages may be:

1. Inferior dam site leading to increased construction costs.
2. Need to develop well field and associated infrastructure.
3. Further from Khorixas demand centre.

In conclusion, it must be remembered that the total demand for the Khorixas area, which currently runs to 1.892Mm³/annum is expected to rise to 7.337Mm³/annum by the year 2020.

8.4.3.10 Omaruru River

General

The Omaruru River rises on the north-western and southern flanks of the Etjo mountains, approximately 70km to the north-west of Omaruru Town, and flows via the towns of Omaruru and Okombahe to the coast.

Data

The oldest runoff record for the Omaruru River dates back to October 1943, when a gauging station was opened just downstream of Omaruru Town and it has been operating ever since. While it has always been difficult to derive an accurate water level/discharge relationship for the station, the runoff record nevertheless provided the basis for the runoff record used for the hydrological evaluation of the proposed Ojompauve Dam. For this study, the more accurate but shorter Elemba weir record was extended with reference to the Omaruru Town record. For the OMDEL Dam hydrological study in 1989, the Ojompauve record was updated and a rainfall/runoff model used to produce a record at the Nei-Neis gauging site. This record was then used to extend the Henties Monument gauging weir record back to 1943/44.
Water Resources

Runoff potential within the Eljo mountains is very high in comparison with other areas in Namibia, with unit runoff values of up to 30mm (refer to Figure 3.3). Almost the entire catchment upstream of the Omburo gauging weir, which amounts to 1,360km², has a unit runoff of 15mm or more.

The other area of high runoff potential is the Erongo mountains, where a major tributary, the Okondeka River, rises. This tributary joins the Omaruru River just upstream of the Etemba gauging weir, which is close to the proposed Otjompaue Dam site. At this point the catchment area is 3,810km², which, although only about 30% of the total catchment area, is responsible for the vast majority of generated runoff. The mean annual runoff of the Omaruru River reaches its maximum around this point, and steadily declines towards the coast as transmission losses increasingly outstrip contributions from tributaries.

From the Otjompaue Dam site onwards, the Omaruru River passes through a deep gorge until well past the Nei-Neis gauging station. The depth of the gorge then gradually lessens towards the coast, and after the OMDEL Dam, the river flattens out into a wide alluvial plain underlain by a number of deep palaeochannels, which form the so-called Omaruru Delta. These channels have a large storage capacity and are an important water source for water supply source for the Central Namib Area.

As already stated, a runoff record was generated for the OMDEL Dam at the time of the feasibility study for the recharge enhancement scheme. This record had been updated to 1993/94 using data from the Henties Monument gauging weir, and after closure of the dam wall, from records kept at the dam itself.

The other gauging point of interest on the Omaruru River, is the Etemba weir which is close to the Otjompaue Dam site. A study carried out in 1983 led to the drawing up of a record going back to 1943 and this record was in turn updated as part of the Central Area Master Water Plan in 1993. The statistics of this record are summarized in Table 8.4.

Table 8.4: Runoff Statistics for Etemba and OMDEL Dam on the Omaruru River.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Etemba Weir</th>
<th>OMDEL Dam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of Record (years)</td>
<td>58</td>
<td>51</td>
</tr>
<tr>
<td></td>
<td>(1923/24-1990/91)</td>
<td>(1943/44-1993/94)</td>
</tr>
<tr>
<td>Mean Annual Runoff (Mm³)</td>
<td>41.75</td>
<td>13.96</td>
</tr>
<tr>
<td>Standard Deviation (Mm³)</td>
<td>78.95</td>
<td>37.22</td>
</tr>
<tr>
<td>Coefficient of Variation</td>
<td>1.69</td>
<td>2.67</td>
</tr>
<tr>
<td>Median Annual Runoff (Mm³)</td>
<td>14.07</td>
<td>0</td>
</tr>
<tr>
<td>---------------------------</td>
<td>-------</td>
<td>---</td>
</tr>
<tr>
<td>No. of Zero Flow Seasons</td>
<td>10</td>
<td>26</td>
</tr>
</tbody>
</table>

**Water Resource Development**

- **Recharge Enhancement**

OMDEL Dam was commissioned in 1992 as part of a scheme to enhance recharge to the OMDEL aquifer between the dam and the coast. The runoff record summarized in Table 8.4 for the OMDEL Dam, was used to re-assess the potential of the OMDEL Dam. Unlike the other rivers investigated for recharge enhancement in this study, where a number of possible reservoir capacities were investigated, the OMDEL Dam has already been built, and the capacity is therefore known to be 41.288Mm³.

The recharge potential was re-assessed in 1995 for four cases of transfer efficiency, 70%, 80%, 90% and 100%. These transfer efficiencies relate to the percentage of stored water that actually goes to recharge. The losses are accounted for largely by evaporation from the reservoir itself, and evapotranspiration from plants between the reservoir and the target aquifer. The original investigation also considered these same transfer efficiencies. Figure 8.6 summarises the findings.

Assuming a 70% transfer efficiency to be realistic, the average contribution to recharge is estimated at 5.147Mm³/annum. Previous studies have shown, however, that a reduction in natural river flow over the aquifer will result in a decrease of 1.5Mm³/annum in the conventional natural recharge process, which had previously been estimated at 4.7Mm³/annum. Total average annual recharge, taken as equivalent to long term sustainable yield is therefore estimated at 8.3Mm³/annum.
Figure 8.6: Recharge from OMDEL Dam (Mm³)

- **Open Water Dam**

At various times, the possibility of linking Otjombaue Dam into the coastal supply system had been considered. As already indicated, the mean annual runoff at the Otjombaue Dam site is the highest at any point on the Omaruru River, amounting to 41.75Mm³.

This value does not differ significantly from the value of 40.48Mm³/annum used in the original hydrological study for the Otjombaue Dam conducted in 1984. In this study a dam with a capacity of 55.37Mm³ was shown to have a 95% reliable yield of 11.2Mm³/annum.

**Possible Impacts of Development**

While the Otjombaue Dam has a high yield, it is clear that there would be a significant negative effect on the potential of the OMDEL Dam recharge scheme. A study carried out in 1984 analysed the effect on flow downstream of the potential dam. Assuming an abstraction of 9Mm³/annum (a little less than the estimated 95% reliable yield), and a dam with a capacity of 60Mm³, it was found that the mean annual runoff immediately downstream would be reduced to 24.6Mm³/annum. More significantly, perhaps, the longest period of no flow observed in the historical record, would increase from 32 months to 150 months. The number of months with flow would be reduced from 19.4% of the total months, to 6.5% of the total months.
The effect on the OMDel Dam would clearly be negative. No attempt has been made to quantify the "post-Otjompuae Dam" yield for the OMDel Dam recharge potential, and it is considered beyond the scope of this study to investigate this. It is clear, however, that if there is a wish to properly assess the feasibility of the Otjompuae Dam, such a study would be necessary.

The presence of the OMDel Dam as a strategic water source for the supply of water to the towns of the Central Namib coast means that the upper Omaruru River is increasingly regarded as a resource which cannot be developed much further for fear of reducing the availability of water for the OMDel Dam scheme. This means that any major development elsewhere in the basin may be restricted. However, the implementation of sea water desalination at the coast may ease this restriction.

8.3.4.11 Swakop River

General

The Swakop River Basin, which includes the major Khan River tributary has an area of 30 100km², the largest of the westward-flowing rivers. It is also the most developed of the basins, both in terms of water resource developments and urban settlements.

The Swakop River rises in the mountains to the east of Okahandja, and north-east of Windhoek, where mean annual precipitation is over 400mm. The unit runoff in this area is estimated at 7mm, which is lower than might be expected for this type of terrain, and the value may have been affected by the large number of farm dams in the catchment. The capital city of Windhoek falls within the Swakop catchment, and other towns include Okahandja, Karibib, Usakos and Otmbingwe and of Swakopmund. There are probably close to 500 000 people living within the Swakop catchment.

Data

Including the water supply dams of Von Bach, Swakopoort, Avis and Goreangab, which also act as gauging stations, there are ten runoff gauging stations on the Swakop River and its tributaries.

As with most of the westward-flowing rivers in Namibia, the quality and length of runoff records tends to be better in the upper part of the catchment than the lower. In the Swakop River mainstream, the longest records are from
Westfalenhof, just downstream of the Swakopoor Dam, and from Von Bach Dam (as well as the gauging station that preceded its construction).

**Water Resources**

A runoff record for the Swakop River near the mouth covering the period 1901/02 to 1986/87, has been compiled by the Hydrology Division of the Department of Water Affairs.

Due to the fact that the Von Bach and Swakoppoor Dams came into operation in 1971/72 and 1977/78 respectively, it is clear that observations for the Swakop River mouth preceding 1977/78 will have to be adjusted to reflect the presence of the two dams. To do this accurately would require the setting up of a detailed model, which is considered to be beyond the scope of this study. In addition, the derivation and calibration of such a model may be of limited value in view of the approximate nature of the runoff observations at the Swakop mouth.

For the purposes of the 1995 Central Namib Area Water Supply Study, the runoff data were adjusted using a combination of two approaches. One involved utilising the Unit Runoff Map for Namibia for the catchment downstream of Swakoppoor Dam, while the other involved an empirical calculation of intercepted volume and subtracting this from the observed record. The statistics of the records are summarised in Table 8.5. Also included in the table are the statistics of the period of "virgin" catchment, i.e. the pre-dam situation from 1901 to 1970. Column 4 shows the statistics of the observed record up to 1970/71, while column 5 shows the statistics for the same period for the adjusted pre-dams situation.

The final two columns of Table 8.5 provide a good indication of the change in flow regime resulting from the construction of the two major dams.

**TABLE 8.5: STATISTICS OF OBSERVED AND ADJUSTED RECORDS FOR SWAKOP RIVER NEAR SWAKOPMUND.**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Estimated and Observed Record 1901/02-1993/94</th>
<th>Adjusted Record 1901/02-1993/94</th>
<th>Observed Record 1901/02-1970/71</th>
<th>Adjusted Record 1901/02-1970/71</th>
</tr>
</thead>
<tbody>
<tr>
<td>Record Length (years)</td>
<td>93</td>
<td>93</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>Mean (Mm³/a)</td>
<td>31.94</td>
<td>23.32</td>
<td>36.96</td>
<td>26.29</td>
</tr>
<tr>
<td>Median (Mm³/a)</td>
<td>0</td>
<td>0</td>
<td>5.00</td>
<td>0</td>
</tr>
<tr>
<td>Standard Deviation (Mm²/a)</td>
<td>81.81</td>
<td>72.89</td>
<td>86.75</td>
<td>77.81</td>
</tr>
<tr>
<td>----------------------------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>Coefficient of Variation</td>
<td>2.56</td>
<td>3.12</td>
<td>2.35</td>
<td>2.96</td>
</tr>
<tr>
<td>No. of Zero Flow Seasons</td>
<td>50</td>
<td>75</td>
<td>33</td>
<td>57</td>
</tr>
<tr>
<td>Max. Period of No Flow (years)</td>
<td>8</td>
<td>12</td>
<td>5</td>
<td>12</td>
</tr>
</tbody>
</table>

The most significant difference is the presence of a non-zero value for median in the pre-dam observed record, where only 33 of the 70 years of record were no-flow seasons, compared to 57 out of 70 in the adjusted post-dam situation. This implies that the average frequency of flow has been reduced from one season in 1.9 years to 1 in 4.11 years. When the total flow record is investigated (adjusted record over 93 year period), it would appear that the average frequency of flow is 1 in 5.17 seasons. It is clear that while significant volumes of water flow in the lower reaches of the Swakop River, the frequency of flow is vastly reduced. This makes the construction of a dam near the coast uneconomical, since the dam would lie empty for long periods of time. Recharge by fresh water is also spasmodic. However, the possibility of recharge enhancement has also been considered and could yield more favourable results.

The potential of the Khan River has been investigated by the Department of Water Affairs in a number of studies, the most relevant included the drawing up of a synthetic record for the Khan River at the Rössing Mine. The record, which covered the period 1925/26 to 1986/87 comes from this study. The period 1987/88 to 1993/94 has been derived from observations at Usakos, and routed down to the Rössing site. The statistics of the record are summarised in Table 8.6 below.

**TABLE 8.6: RUNOFF STATISTICS FOR KHAN RIVER AT RÖSSING**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Combined Synthetic Record (1925/26 - 1993/94)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Record length (years)</td>
<td>59</td>
</tr>
<tr>
<td>Mean (Mm²)</td>
<td>3.34</td>
</tr>
<tr>
<td>Median (Mm²)</td>
<td>0.00</td>
</tr>
<tr>
<td>Standard Deviation (Mm²)</td>
<td>13.00</td>
</tr>
<tr>
<td>Coefficient of Variation</td>
<td>3.89</td>
</tr>
<tr>
<td>No. of Zero Flow Seasons</td>
<td>36</td>
</tr>
</tbody>
</table>
**Water Resource Development**

The Swakop River has been intensely developed in its upper reaches. The effects on the downstream environment are significant. There are several major bulk water supply schemes on the Swakop River including Central Namib, Swakopmund, Daan Viljoen, Gross Barmen, Karibib, Okahandja, Otjimbingwe, Swakoppoort, Karibib, Usakos and Windhoek.

As expected, in years of extreme floods, the effect of the two major dams on any additional potential water storage dam in the lower reaches would not be significant, but the increased number of zero flow years, reduction in mean and the increased coefficient of variation are negative indicators with reference to any potential development. Indeed, the presence of such a high number of zero flow years, as well as the possibility of long periods (on average 5 years) without any inflow, makes a conventional surface water storage reservoir a non-starter. This is not necessarily the case for a recharge enhancement scheme, the key principle of which would be to transfer the entire contents of any surface water storage reservoir to groundwater storage during the eight-month dry season. In this way evaporation losses are minimized and the reservoir emptied in preparation for the next year.

*Using the 1901/02 - 1993/94 adjusted record, a number of reservoir capacities ranging from 5Mm³ to 35Mm³ were evaluated for potential recharge enhancement.*

![Figure 8.7: Recharge Potential from Dams on the Swakop and Khan Rivers](image)
As was the case with the Swakop River in the pre-dam situation, the Khan River can be expected to flow at least as far as Rössing Mine nearly every two years. The question of a recharge enhancement dam in the Khan River near Rössing has been discussed for a number of years. The advantage of such a scheme is that the borehole infrastructure for abstraction of the recharged aquifer is already well developed.

A dam site close to the mine with a suitable natural side-arm spillway has been located and investigated. The capacity of the reservoir is approximately 7Mm³. The possibility of a larger reservoir must be seen in the light of increased recharge potential. An analysis of recharge potential on the Khan River at Rössing Mine was also carried out and the results are also shown in Figure 8.7. It is clear from the graph that an increasingly larger reservoir does not provide the same return in terms of improved recharge as was evident from a scheme on the Swakop River. The more regular flow frequency of the Khan River means that for reservoirs smaller than 6Mm³ it actually has a greater recharge enhancement potential than the Swakop River. However, for larger reservoir sizes, the Swakop River may have an increasingly greater potential. A reservoir of capacity 9Mm³ on the Khan River at Rossing would yield 1Mm³/annum to recharge. Current recharge via throughflow is estimated by Rössing at between 0.64 and 0.76Mm³ per annum, and this should not be significantly affected by a recharge enhancement dam.

Possible Implications of Development

If the lower Swakop River aquifer were to be treated as a source to be utilised on a continuous basis providing a reliable yield, it is clear that the yield would be limited to approximately 1.5Mm³/annum. Including existing recharge a figure of 1.7Mm³/annum may be possible.

Higher yields could be delivered with lower reliability, thus utilising the resource more effectively. The problem with this approach, however, is that any desalination plant built specifically for desalinating brackish water from the Swakop River Aquifer, would stand idle during years when the aquifer is depleted.

The possibility of recharge enhancement at Rössing may be feasible if a recharge dam can be constructed cheaply. The possibility of using the source beyond the life of the Rössing Mine for supply to Swakopmund, via the existing supply line operated in reverse, would affect the feasibility of the scheme.
Limitations in aquifer capacity will probably have the biggest role to play in determining the feasibility of recharge enhancement schemes on both rivers.

8.3.4.12 Kuiseb River

General

The Kuiseb River rises in the Khomas Hochland, with the uppermost part of the Kuiseb/Swakop River watershed only about 15kms to the west of Windhoek.

Data

The oldest runoff records in the Kuiseb catchment date back to the commissioning of the Schlesien weir in 1960. This weir is well sited and except for the Gaub River, measures the vast majority of runoff generated in the Kuiseb catchment. Its position at the bottom of the escarpment on the desert fringe covers 6 530km² or almost half of the 14 300km² Kuiseb catchment (measured at Rooibank). The Gaub River is also gauged at the desert fringe at the Greylingshof station where records have been kept since 1974/75, and covers an area of 2 490km². Runoff generated downstream of the Schlesien and Greylingshof stations is minimal, although flash floods generated within the desert itself do occasionally occur.

The Kuiseb River and its tributaries are gauged at 18 sites, and is the most intensively gauged river in Namibia. In particular, the upper reaches have been carefully monitored since a general expansion of the hydrological network of the Department of Water Affairs in the late seventies. Downstream of Schlesien, the most important station is the Gobabeb weir which was put into operation in 1977. Further downstream towards are the Zwartbank and Rooibank stations. While efforts have been made to calibrate the Rooibank station, the common problem of a shifting cross-section has made it impossible to derive accurate runoff figures. However, a number of field observations and gaugings carried out by the Hydrology Division of the Department of Water Affairs, together with the reliable Gobabeb record, has made it possible to derive acceptable runoff statistics for the lower Kuiseb. The status of the runoff record for Greylingshof station, which is an open section, is classified as fair, and its records are used with caution.
Water Resources

The upper part of the catchment is generally farmed as cattle ranches and there are many farm dams. In addition, the Friedenau Dam, built in 1970 has a capacity of 6.33Mm³, and its 210km² catchment area lies entirely within the 10mm unit runoff zone. Unit runoff values in the Khomas Hochland range from 4mm in the west up to 10 mm in the east. In this area, soil cover is generally poor.

TABLE 8.7: RUNOFF STATISTICS FOR KEY STATIONS ON LOWER KUISEB AND GAUB RIVERS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Schlesien weir</th>
<th>Gobabeb weir</th>
<th>Greylingshof</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of record (years)</td>
<td>33 (61/52-85/84)</td>
<td>17 (77/78-93/94)</td>
<td>17 (77/78-93/94)</td>
</tr>
<tr>
<td>Mean (Mm³)</td>
<td>15.53</td>
<td>8.38</td>
<td>4.23</td>
</tr>
<tr>
<td>Standard Deviation (Mm³)</td>
<td>21.43</td>
<td>7.19</td>
<td>5.84</td>
</tr>
<tr>
<td>Coefficient of variation</td>
<td>1.35</td>
<td>1.13</td>
<td>1.25</td>
</tr>
<tr>
<td>Median (Mm³)</td>
<td>9.41</td>
<td>4.13</td>
<td>1.45</td>
</tr>
<tr>
<td>No. of zero flow seasons</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
</tbody>
</table>

The last time that the Kuiseb flowed through to the Atlantic Ocean was in 1934. A flood defence wall for Walvis Bay was built after this, making it very difficult for the river to break through to the sea. It seems likely that in the absence of this wall, the river would have flowed through to the sea in 1950, 1963 and 1974.

Water Resource Development

- Gaub Dam

Water levels have been recorded in the Gaub River at Greylingshof since 1974. For the purposes of this study, this record has been extended back by simple correlation with the Schlesien weir record. The mean annual runoff for the observed 20 year record at Greylingshof is only 4.47Mm³. For the same period the mean annual runoff at Schlesien is 8.21Mm³. Extending the Greylingshof record to 33 years by simple correlation gives a mean annual runoff of 8.62Mm³. Monthly values were simply proportioned from Schlesien for 1981/62 to 1973/74.
The proposed Gaub Dam is sited just downstream of the confluence of the Gaub and Kuiseb Rivers. The distance from the Schlesien gauging station to the confluence is 45km, while it is 20km from the Greylingshof station to the confluence. The mean annual runoffs for both the Schlesien and Greylingshof stations have been reduced to allow for transmission losses between these stations and the proposed dam site, and the resultant reduced mean annual runoffs added together.

For both streams, a nett (i.e. including additional flow from tributaries) loss rate of 0.5% per km has been assumed between the gauging stations and the dam site. The result provides an estimate of mean annual runoff for the proposed Gaub Dam.

Taking the 33 year record, the Schlesien mean annual runoff is reduced to 12.64Mm³, and the Greylingshof mean annual runoff is reduced to 7.79Mm³. The combined mean annual runoff is therefore taken to be 20.43Mm³. As a check on this estimate, if it is assumed that this reduces to 10.774Mm³ at Gobabeb as indicated by the 33 year record, a nett loss rate of 0.75% per kilometre is implied. This seems to be of the right order.

- Enhanced Recharge

The possibility of a dam at or near Gobabeb for purposes of enhancing recharge was investigated using a combined synthetic and observed record. Dam capacities ranging from 5 to 25Mm³ were considered. Due to the relatively frequent nature of floods at Gobabeb (6 zero flow years out of 33), the mean annual volume of water available for recharge is quite high. However, unlike the Swakop, Omaruru and Ugab Rivers, the Kuiseb River almost never flows through to the sea.

Possible Implications of Development

It is generally accepted that the water resources of the Kuiseb River are being used at close to, or in excess of their sustainable capacity. However, over the past decade and a half, the river has experienced a very severe drought, with one four year period in the eighties where no flow occurred downstream of Gobabeb. The sort of large flood, sufficient in pre-flood protection wall times to go through to the sea, is estimated as having a return period of 1 in 9 years. Such a flood has not occurred for 21 years. During this period the groundwater resources of the Kuiseb have been used more heavily than ever before. The potential beneficial effects of a large flood have not really been carefully
assessed in any study, but it seems likely that these effects would be quite considerable.

Yield of the Gaub Dam was estimated at 7.80 Mm$^3$/annum in the Central Area Water Master Plan Study. This is considered to be on the high side, and if the Gaub Dam is to be considered as a potential reality, an in-depth hydrological reassessment study would be required. It is clear, however, that a dam at the Gaub site would result in a major loss of yield from the currently utilised Kuiseb aquifers.

8.4 CONCLUDING REMARKS

The westward flowing rivers are a critical resource for Namibia and more specifically the Kunene and Erongo Regions. Several of these rivers have already been developed both as groundwater and surface water resources, and utilisation is already at or beyond a level of sustainability. Others, particularly those in the Kunene region have not been developed to any significant extent. It is important, however, that an integrated approach be used in planning the possible development of these valuable resources. The North-west Tourism Masterplan is in a position to make a contribution in this regard since tourism more than any other sector of the economy, requires water not only as a consumable resource, but also to support and maintain the very environment which attracts tourism.
9. GEOLOGY AND FEATURES OF GEOLOGICAL INTEREST IN THE NORTH-WEST REGION

The information given below is contained in many publications on the geology of Namibia, most of which are listed by SACS (1980), Hugo et al. (1983) and Schalk and Hegenberger (1991). This chapter follows the format of material being prepared on the geological features of Namibia (Miller, in prep.). It is written for the layman and is intended to highlight features of geological interest and the way they formed so that the general landscape will be of more interest to the traveller and tourist.

The continents have been subjected to many periods of rifting, burial, melting deep below the surface, volcanism, mountain building, uplift and erosion as they evolved through time. Namibia and the North-West Region are no different. The earth is 4 500 million years old, an age obtained from nickel-iron meteorites that formed at the same time as the earth. The oldest rocks found on earth have an age of 3 800 million years. Namibia rocks are considerably younger than this. The rock succession is like a series of layers with younger rocks deposited on top of older ones. However, things are more complex than this since the older rocks are often deeply buried, compressed, folded and intruded by molten rocks from below before the next layer of the succession we see today is deposited. Each unit in the succession of rocks is given a name, generally a geographic name from the area where they are best developed. The oldest rocks are extensive because they form the bulk of the continental crust but, because younger rocks cover them almost as extensively, we only find them in relatively small outcrops that stick up through the younger cover rocks.

9.1 THE OLDEST ROCKS

9.1.1 THE EPUPA, HUAB AND ABBABIS METAMORPHIC COMPLEXES

The oldest rocks we have found in the North-West region, and indeed in Namibia, are west of Sesfontein. They are granites and were intruded as hot, molten magma (molten rock) possibly as much as 10km below the surface of a thick crust between 2 900 and 2 600 million years ago towards the end of what is known as the Archaean Epoch. There is nothing very spectacular about these rocks and they look very similar to and are normally very difficult to distinguish from older and younger granites. These rocks are generally light brown in outcrop and extend in a north-northwesterly direction from the area just west of Sesfontein to the Kunene River and into Angola. They also underlie most of the area between Outjo and Kamanjab. These rocks belong to sequences of rocks which geologists call the Epupa Metamorphic Complex in the Sesfontein – Epupa area and the Huab Metamorphic Complex in the area.
between Otjo, Kamanjab and Fransfontein. The largest continuous outcrops of rocks of the Epupa Metamorphic Complex occur between the Hoanib River west of Sesfontein and the Kunene River. The Huab Metamorphic Complex is well exposed in the Huab River and its tributary gorges upstream of the Khorixas – Torra Bay road. The rocks of the Ababbis Metamorphic Complex are similar but they occur in the area between Karibib and Rooibank. They are well exposed in the Rabenrücken on the Khomas Hochland road and in the lowest 20km of the Khan River gorge.

Small amounts of mineralisation of various types occur in places in these old rocks.

9.1.2 KUNENE ANORTHOSITE COMPLEX

The next event occurred about 2100 million years ago and was the intrusion of a huge mass of rock called anorthosite, the Kunene Anorthosite Complex, possibly as much as 30km below surface. This mass of rock forms the Zebra Mountains near the Kunene River and extends in a northerly direction for 350km into Angola. The anorthosite contains lighter and darker coloured bands with the latter often forming the top of the East-West ridges of the Zebra Mountains. It is the rubble from these dark bands that forms the “chocolate sauce” streaks down the sides of these ridges and gives the mountains their name.

Photo 1: Zebra Mountains
9.1.3 KHOABENDUS GROUP AND FRANSFONTEIN GRANITIC SUITE

Uplift and widespread erosion followed, gradually removing as much as 10km or more of rock so that the older Archaean granites were near or may even have been exposed on surface. At this stage rifting and continental rupture may have taken place because the next rocks to have formed, various volcanic rocks of the Khoabendus Group that were erupted about 1 800 million years ago, suggest that the North-West Region was near the edge of a continent. Different types of volcanic rocks indicate a variety of volcanoes. Dark green rocks west of Kamanjab were once hot basaltic lavas with temperatures as high as 1 400° C which flowed from lines of small volcanoes situated along fractures in the earth's surface. Small eruptions of fragmentary, scoriaceous material may also have occurred. The type of volcanic activity may have been similar to that seen on Hawaii today where hot lava can flow like water or creep slowly across the landscape. Fire-fountaining of fragmented, red-hot volcanic rock will have produced scoria deposits.

Red to almost black acid volcanic rocks that are similar to granite in composition are associated with the green, basaltic lavas in the Kamanjab area and also occur extensively in the Okefurutu – Onupembe area and the Otjihipa Mountains. Eruption of these acid lavas will have formed a few large volcanoes and will have been far more spectacular and explosive than the basaltic eruptions and similar in many ways to the Mount St. Helens eruption. These eruptions will have covered very extensive areas around the volcanoes in thick layers of volcanic ash. In the Kamanjab area, thick deposits of coarsely fragmented acid volcanic rock suggest that some of these large volcanoes may have been present in the region.

However, not all the acid lava managed to reach the surface and one finds that the Kamanjab region is riddled with intrusive bodies of coarse-grained granite of the Fransfontein Granitic Suite that have the same age as the lavas or are slightly younger. These granites intruded into the base of the lavas or into the underlying, older granitic crust of the region.

None of the Khoabendus Group volcanic rocks nor their associated intrusive granites form really spectacular topographic features. Many of the little hills between Fransfontein and Kamanjab and around Kamanjab are formed by the granites.

The Kamanjab area has been investigated from time to time for mineralisation but nothing significant has been found.
9.2 THE MOST EXTENSIVE ROCKS IN THE NORTHWEST REGION

9.2.1 THE DAMARA SEQUENCE AND ITS ASSOCIATED INTRUSIVE ROCKS

Most of the North-West region and many of its hills, ridges and mountain ranges are underlain by rocks of the Damara Sequence. By the end of the Damara episode, the whole region was part of a network of Alpine-like mountain chains (orogens) that surrounded and criss-crossed Africa but its evolution took place through a sequence of events lasting from about 900 to 460 million years ago. These successive events were rifting, continental separation (continental drift) and ocean formation, reversal of the continental drift movements and ocean closure, and finally continental collision. Some of the events recorded in the rocks of the Damara Sequence were of global significance.

9.2.1.1 RIFTING

Evolution of the Damara Orogen began with the formation of rift valley systems like those of East Africa in an old super-continent much like Gondwanaland must have been. In other words, Africa was part of a huge continental mass that extended far to the west of the present West African coastline. One rift system, extending from Cape Town to West Africa, formed along what is now our present west coast. Another two branched off from the first at Swakopmund and Meob Bay, ran in a north-easterly direction and gradually converged as they passed through central Namibia, northern Botswana and along the present-day Zambezi valley. Over a period of about 150 million years, the North-South rift gradually deepened and eventually became the site along which the super-continent split apart. As a consequence, a new ocean formed where the Atlantic Ocean now is. This early "Atlantic" ocean has been called the Adamastor Ocean by scientists.

Over the same period, the two North-East-trending rifts also deepened. Both contained highly saline rift lakes, again very similar to the present-day saline lakes in East Africa. The best preserved examples of these sediments occur South-East of Windhoek on the farm Gurnumas on the Gamsberg road. Towards the end of the rifting phase, a series of volcanoes developed along the northern edge of the northernmost of these two rifts (represented by a line from Khorixas, through Ovitto to Otavi). The most spectacular of these volcanoes was located in the Summas Mountains (east of Khorixas) where almost 7km of volcanic rock accumulated in the rift right next to a very high rift shoulder. The compositions of these volcanic rocks were highly unusual and very variable, yet another feature of major continental rift systems. The volcanic rocks have an
age of 750 million years. In several other parts of the world one finds similar rift-related volcanic rocks of the same age suggesting global disturbances deep within the earth at that time.

The two North-East-trending rifts were filled with at least 6km of sediments in places. Subsidiary rifts also developed extensively over large areas to the north and south and east of the North-South rift. These subsidiary rifts were gradually filled with sandy riverine sediments which now, after having lithified, form the western part of the Steilrandberge, parts of the Baines and Otjihipa Mountains and the Omuhonga and Etoroha Mountains.

At about the end of the rifting phase and just before continental separation began to manifest itself, the first of three or four global ice ages gripped the earth. The second and third of these are well represented from Tsumeb to Sesfontein and will be described later.

9.2.1.2 CONTINENTAL SPLITTING AND SEPARATION (CONTINENTAL DRIFT)

As the African and the South American continents began to separate and the Adamastor Ocean began to deepen, a new continental margin developed along the whole of the West African coast. This type of continental margin, having no coastal mountain belt with active volcanoes as in the Andes and Rockies, is referred to as an Atlantic-type margin because of its similarity to the present-day Atlantic continental margins. Thick sediments accumulated on the continental shelf, the continental slope and in the deep water off this ancient Namibian coast.

The continental shelf was wide and shallow and covered the area from the Khoraxa-rams Fountain (South-East of Sesfontein) and the Otjihipa Mountains in the west to beyond Otjovasandu and Ruacana in the east. Most of this region was like a shallow, warm sea in which algae grew and a thick succession of limestones and dolomites were deposited over a period of about 50 million years. These limestones and dolomites have been named the Otavi Group and now build the mountains immediately west of Warmquelle (including the walls of the Khowarib Gorge), north of and southwest of Sesfontein, east of the Otjovasandu – Ruacana road, the Giraffen- and Tonnesenberge, the Onjaraka and Ehombo Mountains, and parts of the Otjihipa and Baines Mountains.

Westwards, the continental shelf began to deepen towards the continental slope and deeper water. The limestones and dolomites became progressively thinner but thick muds were deposited in their place. Often the thickest pile of
sediments is located near the outer edge of the continental shelf. Such muddy sediments, now represented by mica schists, form many of the desert ridges from the Hunkab Fountain to the Hartmann Mountains. Large inland river systems must have existed which transported their debris from the continent to the coast. These often form large, muddy, submarine deltas offshore. Many also gouge a submarine channel on the shelf which funnels the heavy, sediment-laden water during major onshore floods right across the shelf and dump their sediment load down the continental slope or at its base in huge submarine fans in which individual layers of sediment maintain a very uniform thickness over great distances. Such rhythmically layered, deep-water sediments are called turbidites. The upper parts of the thick pile of waterlogged sediments near the outer edge of the continental shelf is often rendered fluid and highly unstable by the shaking of earthquakes which are particularly abundant along a newly formed continental margin that is still sinking deeper into the ocean. Such highly fluid sediments will slump and flow down any slope that they rest on and it is common for them to form part of the deep-water turbidite succession. Small turbidite fans are interbedded in places with the above schists from the Hunkab Fountain to the Hartmann Mountains. However, the most impressive succession of deep-water turbidites occurs along the lower reaches of the Ugab River west of Brandberg. We have been able to verify that almost every single, shallow-water lithological unit on the old Damaraan shelf has its equivalent in the deep-water turbidites along the Ugab River.

Continental separation did not take place in the rift running North-East from Swakopmund but the rift itself deepened continuously throughout the 50 million years that continental drift was taking place to the west and south. By the end of this period this rift was under deep water and 15km of sediment had accumulated in it, much of it also turbidite.

During this period limestones and dolomites also accumulated in the area from Karibib to Swakopmund. These are now coarsely crystalline marbles. They were quarried by the Germans near Karibib and are again being quarried in places.

Continental separation did occur along the southernmost of the two NE-trending rifts and Southern Africa began to drift away from Angola, Zambia and the rest of Africa. The resulting ocean may have been rather narrow, a little like the Red Sea, and extended from central Namibia through northern Botswana along the Zambezi Valley to Mozambique. It joined the N-S Adamaster ocean at Moeb Bay. In central Namibia it was located between Gobabeb and Rostock, Windhoek and Okahandja, and Omitara and Hochfeld. Great piles of turbiditic sediments were deposited along the margins of this ocean and are now
represented by the weather-resistant quartzites of the Auas and Hakos Mountain (the southern margin is this narrow ocean) and the greyish green, rhythmically layered rocks between Tinkas and Klipheus on the Kuiseb River North-East of Gobabeb (northern margin). This ocean, like all our major oceans of today, including the Red Sea, had a mid-oceanic ridge which was volcanically active. The volcanism at such ridges produces new oceanic crust continuously. Thus, these ridges are the location at which spreading takes place, enabling continents to move further and further apart during continental drift. The Matchless Amphibolite Belt is the product of the sea-floor volcanism of this Damaran mid-oceanic ridge. The belt is about 1km wide, consists of black amphibolite which is simply basalt altered by metamorphism and extends unbroken from Otjihase through Windhoek to the defunct Gorob and Hope Mines east of Gobabeb. There is a very good section through it in the Rutile River near where the Gamsberg road crosses the Kuiseb River. Submarine, hot-water springs with temperatures of 350°C are often associated with submarine volcanism. Many of these pour out black metal sulphides ("black smokers") which settle onto the seabed nearby. If they last long enough they can form economic minerals deposits. Twelve such mineral deposits occur along the Matchless Belt. These include Gorob, Hope, Matchless and Otjihase but the latter two are the only ones that have been mined successfully.

It was recognised decades ago that the warm-water, limestone/dolomite succession of the Otavi Group and that in the Karibib – Usakos area also contained a unit deposited by glaciers, i.e. that cold-water conditions had prevailed for a brief period. Recent mapping has identified two such glacial units in the Otavi Group. However, the detailed research and laboratory analysis that accompanied this mapping has revealed that these glacial events were dramatic. Vast algal blooms in the world's oceans appear to have so depleted the earth's oceans and atmosphere of carbon dioxide (CO₂) that the whole world, including all the oceans, froze over completely (the Snowball Earth – Hoffman et al., 1998). Yet the geological record tells us that warm-water conditions were re-established and that normal deposition of limestone and dolomite was resumed. The total freezing killed off almost all life forms, all but the hardiest. Thus, the only source of new CO₂ available to raise the CO₂-content of the atmosphere sufficiently to retain the heat of the sun so that melting of the global ice sheet could occur were volcanoes. However, the CO₂-content of the atmosphere will have to have been many times higher than what it is today to cause this melting. Freezing of course resulted in a major retreat of the oceans before they were totally frozen. Thawing, on the other hand, led to tremendous flooding and one finds that the chaotic debris generated by glacial erosion is overlain by extensive deep-water deposits. Evidence for this freezing over has been found in other parts of the world but the Otavi Group rocks
contain one of the best preserved records of two of the glacial cycles. They are well represented in the rocks of the Khowarib Schlucht but they are not conspicuous and unless one knows what to look for even the well trained geologist will miss them.

Submarine hot springs occur on the seabed in places, particularly where the underlying crust and new continental margin are unstable and are still in the process of sinking below the ocean. Such hot prings puff out clouds of black metal sulphides into the water which settle onto the seabed to form mineral deposits. In the Damara Orogen, deposits that formed in this way and at this time are Namib Lead near Swakopmund and Tsonguari northwest of Sesfontein (both lead and zinc). During the two glaciations, cold, deep, iron-rich basinal waters circulating in the Damaran oceans (the Adamaster in the west and the other stretching north-eastwards across Africa) deposited their iron when they came into contact with the shallow, oxygen-rich waters on the shelf. Thin black layers of low-grade iron ore are common in the glaciogenic rocks from Outjo to Ruacana but large deposits (also low grade) formed at Owhende and Ongaba north of Sesfontein and at Okatjise and Zebraeskop/Omborombonga south of the Summas Mountains.

This period of continental drift appears to have led to a global reshuffling of the continents. One finds, for example, a characteristic belt of rock that stretches from Kwazulu-Natal to Namaqualand has its equivalent in Canada that is identical in rock types, history and age.

9.2.1.3 OCEAN CLOSURE

Some process deep within the earth that we do not understand caused some of the continents to reverse their motions and instead of moving away from each other, they began to converge and reassemble. On one side of the oceans that were beginning to reduce in size and close, and along the margins of some of these continents, deep trenches formed in the ocean (like the Peru-Chile Trench and the Guatemala Trench off western South and Central America). Mountain belts with active volcanoes formed along the adjoining continental margin (Andes, Rocky Mountains) and the rocks deep within the belt were heated up and, under the compressive stresses that accompany the formation of such mountains, began to deform and fold like a crumpled table cloth. The area from Swakopmund to Okahandja was such a mountain belt. Much of the molten rock that might have fed volcanoes along this belt never actually erupted. It got stuck instead some 14km below the surface where it formed great balloon-like bodies of granite. From Okahandja to Walvis Bay and from Otjiwarongo to the Ugab River mouth there are over 200 such bodies of granite.
Most weather easily and do not form good outcrops but a few are very weather resistant and form prominent bald or rubbly hills such as between Omaruru and Omatjete. The Bloedkoppel is another such granite hill but the most impressive of all are the high bald granite mountains (bornhardts) on the farms Kaltenhausen and Wilsonfontein south of Karibib.

9.2.1.4 CONTINENTAL COLLISION

If convergence continues to its conclusion, the oceans separating converging continents will become narrower and narrower (Mediterranean) until they disappear altogether and the converging continents collide in the same way that India has slammed into Asia. Huge Himalayan and Alpine-type mountain belts form as the edge of one continent slides and grinds over the edge of the other and the crust almost doubles in thickness. Massive earthquakes occur throughout the collision process as vast masses of rock slide past each other. The sediments that had been deposited on the edges of each of these continents get squeezed and crumpled (folded in geological parlance) and sometimes reshuffled like a pack of cards. Thus, west of a line from Sesfontein to the Marientruss, the layers of Damaren sedimentary rocks stand up on edge with the more weather-resistant of them, such as quartzites and sandstones, forming the mountain ridges of this region. To the east of Sesfontein, compression was not as tight and much more open folds can be seen in the mountains formed by the Otavi Group limestones and dolomites (e.g. Kohwarib Schlucht). Exposures of the turbidites along the lower reaches of the Ugab River are magnificent. These rocks have been tightly folded and many spectacular folds can be seen along the river and in its tributaries (e.g. Monument Fold).

In the North-West region, closure of the Adamastor Ocean and continental collision occurred about 600 million years ago when South America slid over the central African continent (Angola and north thereof). The Sesfontein Thrust Fault which dips gently westwards is a manifestation of this collision. The fault is very clearly marked on the geological maps of the region. It is demarcated by the springs in the slope of the first N-S line of hills just west of the village. Specific minerals such as kyanite in the rocks now exposed west of Sesfontein point to a mountain belt with as much as 24km of rock above present-day outcrops. The crest of this mountain belt stretched from near the Huab River mouth, passed through the region around the mouth of the Ganasub River and extended up to the Hartmann Mountains and beyond into Angola.

The Auas and Hakos Mountains south and southwest of Windhoek mark the site of collision of the Southern African continent with the central African
continent some 60 million years later. The resulting mountain belt formed part of that already existing between Okahandja and Walvis Bay and north thereof.

Formation of the granites referred to above and their associated pegmatites (very coarse-grained veins of granitic composition which are often mineralised) continued for another 80 million years after continental collision and resulted in the formation of the uraniferous granites of Rössing, the tin-bearing pegmatites of Uis and the widely scattered tourmaline- and lithium-bearing pegmatites of the Karibib – Usakos – Uis – Omururu area. The Navachab gold deposit formed at this time, as did the lower temperature quartz vein deposits just beyond the northern edge of this zone of granites such as the tin/tungsten-bearing veins at Brandberg West and Goatagab and the gold-bearing veins at Ondundu. The convergence and continental collision stages of development of the Damara Orogen where conducive to the formation of copper, lead and zinc deposits in the Otavi Group rocks east and north of Sesfontein. These are all small but their setting and age are very similar to the copper and lead/zinc deposits of Zambia. One particularly interesting deposit is Omahe where turquoise chrysocolla and dark green crystals of diopside are mined (both copper minerals).

This period of continental separation, convergence and collision with the concomitant formation of various mountain belts led to the assembly of most of the world’s continental fragments into one supercontinent, Pangaea, of which Gondwanaland, consisting of South America, Africa, Antarctica, Australia and India, formed the southern part.

9.3 THE PALAEOZOIC TO MESOZOIC PERIODS

This time span takes us from 550 to 65 million years.

For the next 250 million years after the formation of the Damaran Mountain belts nothing much happened other than the erosion and gradual removal of these huge mountains chains. This erosion was, for the most part, very effective and only relatively low remnants remained (as they still do today) in the Auas and Hakos mountains south and southwest of Windhoek and in the Sesfontein Baines Mountains regions.

9.3.1 THE KAROO SEQUENCE

Rocks of the Karoo Sequence were deposited over most of Gondwanaland and can be found in patches in the NW region from the Cape Cross – Brandberg – Okenyenya region to the Kunene River. Karoo sedimentation began with glacial conditions, followed by the formation of broad shallow basins. These basins
gradually shallowed and dried up with time. Finally desert conditions prevailed.
All these events and stages of deposition occurred over the whole Gondwanaland supercontinent.

Rifting also occurred at an early stage in the Karoo evolutionary cycle. A North-South rift valley is located at the mouth of the Huab River, very close to the location of and orientated in the direction as the future continental rupture zone. This rift valley continued to deepen throughout the Karoo depositional episode so that every stratigraphic unit described below is present and thickest in this ancient rift valley. The deep Toscanini “oil” well at the mouth of the Huab River is located on this rift.

9.3.1.1 THE DWYKA GLACIATION

This initiated the start of Karoo sedimentation and began with the formation of vast ice sheets about 300 million years ago. Most of northern Namibia was covered in ice at this early stage. The ice sheet flowed slowly down-hill and, since it was made up of solid material that carried large amounts of rock debris at its base, it was highly erosive and planed off huge areas.

The old pre-Karoo surface that was planed off by the early Dwyka ice sheet can still be seen a few kilometres south of Khorixas and also west of Khorixas towards the Huab River (Bethanis area). Standing back, one notices here that the tops of the hills in these areas are all flat (in the Bethanis area some of the hills still have terraced remnants of Karoo rocks on them) and were once part of one, single, flat planation surface. One can also see it if one crosses the Ugab River on the way from Khorixas to Sesfontein. At the turnoff to the farm Nil Desperandum, look back eastwards. The old, flat, re-exhumed plain shows up very clearly with a few remnants of Karoo rocks resting on it. The Karoo sediments and younger lavas that were deposited on this plain protected it from erosion until only recently. Post-Gondwanaland erosion (which started after Africa and South America broke apart for the second time) removed all these sediments, re-exposing and cutting down through the old surface. Only parts of this 300 million year-old surface now remain.

Gradually, the ice sheet began to melt and retreated to the northeast but several long-lasting, westerly flowing glaciers remained. These cut deep, U-shaped canyons across what was still a highly elevated region extending from the Sesfontein – Kamanjab area to the Kunene and on into Angola. Some of these canyons, like that now followed by the Kunene River, must have been almost two kilometres deep (present elevation difference between the top of the Baines Mountains and the floor of the valley is 1.5km). Other glacial valleys that
still contain remnants of Dwyka or younger Karoo rocks and are followed by present-day rivers are the Engo, Munutum, Nadas and that containing the Petrified Forest. Most of the glacial debris was carried by the ice sheet and glaciers to a vast, shallow depression between Africa and South America but patches of glacial rubble have been left in some of the valleys and in the Doros – Gai-as area northwest of Brandberg. Polished, glacial pavements in the hard granites of the Epupa Metamorphic Complex can be found at Otjihua and in the river which the road to Orokan near the Epupa Falls follows.

9.3.1.2 LOWER PERMIAN KAROO SEDIMENTS

The Permian is a time period that lasted from about 300 to 260 million years.

As the Dwyka ice sheet and glaciers retreated, the glacial valleys became major river systems feeding sediment into the shallow basin in the west which was increasing in area as it filled with water. Sediments that accumulated along the margins of this basin can be found at Erongo, in the Bocock's Bay – Messum – Brandberg area, the Doros – Gai-as – Huab River area, in the region of the Petrified Forest, between Purros and Oropembe, and in the above-mentioned glacial valleys. Although conditions were still cold, a tundra-like vegetation thrived in low lying areas. The early sediments in the basin were mainly muds with a few interbedded sandy layers which, over time, lithified to shales and sandstones. The muds contained abundant, very fine-grained plant debris that, having decayed under oxygen-free conditions after burial, turned to pure carbon which imparts a grey colour to the present-day shales. Conditions typical of a flat, waterlogged tundra with abundant peat bogs existed along the margins of the shallow basin. Over time, layers of pure plant debris, some only millimetres thick, others metres thick, accumulated in this tundra environment. This material is now coal which one can find near Doros. Some of the coal contains poorly preserved leaf impressions of larger plants that grew on the tundra, *Ganganopteris* and *Golossopteris*. In the Toscanini "oil" well the coal is 10m thick but it is more than 700m deep and of no commercial value.

As time passed, the climate began to warm up and periodic flooding took place. This transported large amounts of sand into the margins of the basin. One such flood or period of flooding carried huge tree trunks (*Dodaxiloton*) with the sand. Silicified over time, these trunks can now be seen in abundance at the Petrified Forest and less commonly, yet still very impressive, in the Gai-as area. The warmer water conditions are also indicated by yellow, algal limestones which were deposited, along with green shales, during quiet conditions that prevailed when floods were not dumping sands into the basin.
At this time, fish were present in the basin and a few isolated fossil fish have been found in the Gai-as area.

For a brief period, the basin was deep and covered large parts of Southern Africa and South America. Algal matter in surface water appears to have been abundant but anoxic conditions prevailed below surface. In South Africa, southern Namibia and South America, the sediments that accumulated were so rich in organic matter that they were capable of producing oil once they had been deeply buried. In the NW region, however, the basin was too shallow for such oil-prone sediments to accumulate. Nevertheless, the fossils that characterise this unit over such a vast area are also present in the NW region. The remains of one animal in particular are abundant (if one looks in the right place), the free-swimming, amphibious reptile, *Mesosaurus*. It occurs in the Gai-as area very near the top of this succession of Lower Permian shales and sandstones.

9.3.1.3 MIDDLE TO UPPER PERMIAN SEDIMENTS OF THE GAI-AS FORMATION

These are striking red to purplish shales and sandstones which occur in the Gai-as area and are also known from Brazil. The red colour, as opposed to the greys and greens of the underlying shales, is indicative of oxidising water conditions which only occur in shallow water. Progressive shallowing and drying up of the basin is also indicated by the red sandstones which become more abundant towards the top of this succession (mud is deposited in quiet deep water, sand in shallow water).

9.3.1.4 TRIASSIC SEDIMENTS OF THE OMINGONDE FORMATION (260 – 210 MILLION YEARS)

The Triassic period in Namibia was marked by faulting and earthquakes along two NE-trending linear zones, one extending from Swakopmund through Erongo to the Waterberg, the other much smaller and located near the Otjungundu Plateau and Okenyena. The fault-related depressions or grabens developed and became sites for the deposition of coarse pebbly debris from the surroundings. These small graben basins dried out regularly (probably annually) or were exposed for long periods during which lime soil profiles with surface calcrites (thin white surface limestone) formed. Conditions may have been very similar to those that prevail in Namibia today with its abundant calcrites. Omingonde sediments form the Otjungundu Plateau and are part of the Karoo sedimentary succession at Erongo.
No Triassic sediments occur anywhere else in the NW region or in southern Namibia which indicates that the margins of the western basin had clearly retreated from Namibia as the drying out process continued.

9.3.1.5 THE TWYFELFONTEIN FORMATION

This represents the culmination of the drying up of all the Karoo basins covering Gondwanaland. The Twyelfontein Formation formed under desert conditions and is a pile of lithified sand dunes, some almost 50m high as in the Gai-as area. In places in this region one can find complete barchanoid dunes. The Twyelfontein Formation is well exposed in the Gai-as – Doros - Twyelfontein – Huab River area where it reaches a thickness of 100m in places. At Twyelfontein itself, it is the cliff-forming unit at the top of the surrounding flat-topped hills. The petroglyphs at Twyelfontein have all been engraved into the layers that formed the slip faces of these ancient dunes. The Twyelfontein Formation also occurs in the Purros - Onupembe – Sanitatas area but is thinner and generally not as well exposed.

This unit is correlated with the Etjo Formation that forms the top of the Waterberg. Throughout Namibia and in the equivalent formation in South America, the Botucatu Sandstone, the dunes face in a northeasterly direction indicating that they were transported by southwesterly winds.

In South Africa, the equivalent formation has an age of 200 million years. A very recent fossil discovery in the Waterberg suggests that the Etjo Formation has the same age. However, we do not know the age of the base of the Twyelfontein Formation but its top is interbedded with Etendeke lavas which have been dated at 133 million years. This suggests that the Twyelfontein Formation may actually be younger than the other units that it is presently correlated with. The Twyelfontein Formation rests directly on the Gai-as Formation but the contact between the two represents a time gap of at least 50 million years and possibly 100 million years or more. Stated another way, this means that the Karoo Sequence in the Brandberg to Onupembe region consists of various sedimentary rock units laid down one on top of the other but with a break of possibly as much as 100 million years during which there was no deposition at all in the region.

Rifting also occurred during deposition of the Karoo Sequence but, as was the case with the Damara Orogen, it took about 150 million years for rifting to evolve into continental break up and separation. This was the next stage in the evolution of the North-West region and was initiated by the Etendeke volcanism.
9.3.2 THE ETENDEKA GROUP

The Etendeka Group is the pile of flat-lying volcanic rocks that make up the Etendeka Mountains and extend from Cape Cross up to Orupembe. These same volcanic rocks cover vast areas in Brazil. They reach their greatest thickness of 900m in the Tafelberg Mountain west of Khorixas.

The Etendeka volcanism was the response to a huge convection cell deep within the earth's crust in a region just off Cape Fria. This cell caused widespread melting below and at the base of the crust and also caused a bulge in the crust. To accommodate this bulge, the crust had to crack and a whole series of fractures and fissures formed.

The bulk of the Etendeka rocks are basaltic lavas which were erupted from the innumerable fractures and fissures in the crust and either flowed like lava rivers or oozed slowly over the countryside, very like the various types of eruptions one sees on Hawaii. Great volcanoes do not appear to have been associated with these eruptions. Indeed, we find the fissures and fractures in abundance, all filled with lava that never reached the surface. These are the dolerite dykes that form lines and ridges of black rock so common in the desert. Although the dykes occur throughout the North-West region, they are most abundant in a 20 km-wide belt stretching from Okombahe to Swakopmund, in the granites between Horingbaai and the Ugab River, just west of the Otjungundu Plateau and at Mowe Bay. The distribution of these dykes indicates that the Etendeka volcanic rocks covered a much greater area than they do at present.

Most of the dykes clearly demarcate the principal fracture directions that were caused by the stresses of the crustal bulge and the tension that finally resulted in rupture of the continent along our present coastline. These directions are North-East and North-West, with minor North-South and East-West sets.

The most spectacular volcanism, however, was produced by a few very large volcanoes, some in Namibia and some in South America. These produced acid volcanic rocks which have a composition that is different and something more akin to granite. basalts contain about 48% silica (SiO$_2$). They are very hot, contain very little dissolved water and gases, extrude at a temperature of about 1500°C and often flow almost like water over large distances (e.g. Hawaii). Acid lavas, on the other hand, contain between 57 and 75% SiO$_2$ (Etendeka acid volcanics – 68% SiO$_2$), usually contain more dissolved water and gases than basalt, extrude at a temperature of about 900°C, are very viscous and, therefore, do not flow at all easily or even very far. In a column of acid lava in a
volcanic vent, one finds the water and gases rising and concentrating in the top of the column. Because of the viscous nature of the lava, the gas can't escape very easily and thousands of gas bubbles form in the lava. Commonly, the lava actually crystallises as it rises in the vent but the decreasing pressure allows the gas in the bubble to expand resulting in shattering of the rock. In this way, most of the rock mass shatters in the vent during an eruption to produce volcanic rock fragments and ash instead of lava. The resulting rocks are called pyroclastic rocks or ignimbrites and the eruptions, pyroclastic or ignimbritic eruptions. Basalts occur most commonly as lava whereas acid volcanic rocks occur most commonly as fragmented pyroclastic rocks.

Some pyroclastic eruptions of acid volcanic rocks simply bubble over the lip of the crater and cascade down the slopes of the volcanic cone. However, as the rising, solidifying rock shatters in the vent, there is, of course, a concomitant and sudden huge expansion of the gas as it is released from its confining bubbles. Thus, pyroclastic eruptions are often highly explosive and destructive and can cover vast areas in the space of minutes. Pompeii and Mount St. Helens erupted in this way but they were miniscule compared to the Etendeka pyroclastic eruptions. A volcano can explode sideways (Mount St. Helens) but often a huge column of red hot rock fragments, ash and gas is blasted several kilometres into the air above the volcano. As it collapses, its fall is deflected by the slope of the volcanic cone and the momentum gained in falling then carries it horizontally away from the vent. Such pyroclastic or ash flows (terms used in the same sense as a lava flow) can travel at speeds of up to 350 km/hour up and down any hills in their way and simply destroy everything standing upright. Forests are knocked over like matchsticks. One eruption picked quartzite boulders from a river bed it crossed and carried them along with the hurtling mass of hot rock fragments, ash and gas.

Through detailed mapping and research work, a total of eight different pyroclastic layers has been found interbedded with the basalts in the Awahab mountains between the Huab and Ugab Rivers and in the Etendeka Mountains (Milner et al., 1992). They range from a few metres to 100m in thickness and can often be recognised in hillsides because they are usually the main cliff-forming units. Orange tops also help to identify them. The most conspicuous of these is the layer that forms the top of the Awahab mountains and that forming the top of all the hills east of the Sesfontein - Khorixes road between the turnoff to Torra Bay and Grootberg. Although it is by no means certain, mapping also suggests that the layers were deposited either as a single eruption or as a series of eruption following very quickly (geologically speaking) on each other. This is supported by the fact that although the pyroclastic layers are sandwiched between basalts, they do not contain any interbedded basalts.
within themselves. Milner and Ewart (1989) have also been able to establish that Messum was the volcano from which four of these pyroclastic layers erupted but we do not know the source for the other layers.

Clearly, single eruptions that produced layers of fragmentary pyroclastic rock up to 100m thick must have been massive. But we did not realise how massive until the same detailed work that had been done in Namibia was carried out in Brazil. This revealed that many of the layers in Brazil are chemically identical to layers in Namibia. The sequence of layering is also the same. Thus each layer has its equivalent in South America and each is one and the same layer. Fitting the two continents back together, revealed that the eruptions from Messum travelled 350km (Milner et al., 1995). Although the initial speed of the eruption may have been 350 km/hour, it would have slowed down as it travelled but it would have taken only two to three hours for it to cover the 28 000 km² represented by the outcrops still preserved today. The four pyroclastic layers sourced from Messum have a combined volume of 8 500 km³ which is equivalent to having a spherical magma chamber at the base of the crust measuring 25km in diameter. Volcanism emptied this magma chamber so it is not surprising that late-stage caldera collapse (large depression in the centre of a volcano) affected Messum so that all the Karoo sediments and the lavas surrounding it were dragged downwards to dip in towards the crater.

Etendeka volcanism must have been very spectacular and highly catastrophic, all the more so since it took only one million years for the whole volcanic pile in Namibia and Brazil to erupt, a very short time span for so much rock to accumulate.

Not all the dissolved water and gas escaped from the basalts and pyroclastic acid rocks when they erupted. Immediately after eruption, these rocks were still very hot and although crystalline and no longer liquid, they were still capable of being deformed plastically. Within hours of erupting, the gas in the uppermost parts of each layer, being almost at atmospheric pressure yet very hot, expanded to form new bubbles in the rock. Thus, one is able to recognise the top of a lava or pyroclastic flow by the abundance of gas cavities at the top. In the basalts, which had very low gas contents to start off with, the gas cavities are small and often not so abundant. In the pyroclastic acid layers, however, cavities are normally abundant and often up to 10 to 20cm across, although in exceptional cases they can be up to 1m across. During the subsequent cooling, fluids, possible sourced from trapped groundwater, seeped through many, although not all, of these porous upper zones. These solutions carried mineral salts with them and slowly various minerals began to grow in the gas cavities often forming well developed crystals. Agate, clear quartz, amethyst, calcite or
various zeolites are the commonest minerals. Agates are common in the Skeleton Coast Park and zeolites in the Tafelberg – Grootberg area. Individual crystals of amethystine quartz and blooms of pale green prehnite occur in the basalts in the Goboboseb Mountains. The amethyst-lined druses of the Sarusas area occur in the top of pyroclastic flows as do the even more impressive specimens from Brazil.

9.3.3 VOLCANOES OF THE ETENDEKA PERIOD

Most of our high, well known inselbergs in the North-West region were volcanoes during Etendeka times, e.g. Brandberg, the Spitzkoppies, Erongo and Okenyeny. None of them look like volcanoes now because they are all deeply eroded and what we actually see are the rocks that got stuck down in the throat of the volcano. There are more, however, which are not so prominent and obvious. These are Cape Cross, Messum, Doros, the Otjohorongo granite (north of Omatjete) and a vent at Henties Bay that is largely covered by sand and about which very little is known.

The present-day remnants of some of the volcanoes are rather simple in composition and structure like the Spitzkoppies and the Otjohorongo granite, being composed only of granite. The granites in all three mountains contain cavities in which well formed crystals of various minerals grew. Those at the Klein Spitzkop are the best developed by far. Brandberg is also largely granite but there are several varieties of granite, some forming very clear circular structures in the main granite. The giant granite boulders that are so typical of the Brandberg provided numerous shelters for bushmen in the mountain. Erongo may not be as deeply eroded as the other volcanoes and has its own unique set of volcanic rocks in its centre. It also contains rather abundant granite, again weathering to produce giant boulders (the Bullen Party) and caves (Phillips Cave). A feature of Erongo is a huge ring fracture with a radius of 30km that partially surrounds the mountain on its northern, western and south-eastern sides. This is filled with gabbro which is the coarse-grained, subsurface equivalent of basalt.

Doros is also fairly simple in composition but is composed entirely of coarse-grain gabbro which crystallised slowly in the form of an elongated, shallow basin that many people have mistaken for a crater. Doros was the source of a small amount of basalt near the base of the Etendeka succession.

Cape Cross and Messum were extremely complex volcanoes and have all sorts of rock types in them, some highly enigmatic. Yet we do not see the equivalents of most of the unusual rock types in Cape Cross and Messum in the Etendeka.
volcanic pile. Besides the pyroclastic eruptions from Messum, the only other volcanic rocks that can be attributed to it are basalts which form a small flow in the Goboboseb Mountains.

9.3.4 CONTINENTAL BREAK UP

The Etendeka volcanism was the surface manifestation of processes deep within the earth that led up to continental break up, the start of the present phase of continental drift and the development of an Atlantic Ocean between Africa and South America for the second time. Final continental separation is believed to have occurred at about 128 million years, five million years after the Etendeka volcanism.

9.3.5 POST BREAK-UP EROSION

We have virtually no record of geological events for the next 50 million years other than the fact that erosion dominated everything and many of the rocks that had just been deposited were being removed to re-expose the older ones underneath. This active erosion phase seems to have slowed down considerably at the end of the Cretaceous, 65 million years ago. By this time it appears as if the Great Escarpment and the low-lying bed-rock plains of the Namib had formed. Subsequent erosion may have been very limited by contrast. Our best record of this erosional period is in the sediments deposited offshore which are an inverse reflection of the old, on-land stratigraphy.

9.4 TERTIARY TO THE PRESENT DAY

All the deposition that took place during the Tertiary in the North-West region was continental in nature, i.e. it did not take place under water. Continental sediments always contain very few fossils and are very hard to date. Our knowledge of the ages of our Tertiary continental deposits is therefore very sketchy. We do not have any geological record of the first 40 million years of the Tertiary in the North-West region.

9.4.1 THE TSONDAB SANDSTONE FORMATION

The first Namib sand sea or erg, the Tsondab Sandstone Formation, accumulated somewhere between 25 and 20 million years ago under hyper-arid conditions. This was far more extensive than the present sand sea. It pushed right up to the foot of the Great Escarpment and into valleys cut into it. It covered the whole Namib from the Orange to the Kuiseb River and, on the evidence of a few preserved remnants further north, is believed to have extended all the way up into Angola. In the North-West region it is best
preserved along the flanks of the Kuiseb canyon and the lower reaches of the Kuiseb River. Good outcrops occur further south at Tsondab Vlei and the farm Dieprivier. In the rest of the Namib north of the Kuiseb River it has been largely removed by subsequent erosion but isolated patches are found at Bakenkoppies at the turnoff to Ganab, in the Hartmann's valley and the Kunene River valley, and in Angola.

During Tsondab times, the Namib and its dunes were home to the ancestors of today's ostrich. Many sites have been found with fragments of egg shell embedded in the sandstone, some just south of the Kuiseb River. These eggs show an evolution through four forms, all larger and thicker shelled that the eggs of our present ostrich. A few complete shells are displayed in the museum of the Geological Survey.

9.4.2 EARLY HISTORY OF THE WESTERLY FLOWING RIVERS

Some of the westerly flowing rivers will have followed the old, U-shaped Dwyka valleys but much of what we understand of the early history of these rivers is based on the interpretation of the evolution of the Kuiseb River (Ward, 1987).

A few of our rivers cut broad, shallow valleys into the underlying bedrock during the mid Tertiary and prior to deposition of the Tsondab Sandstone. During Tsondab times, i.e. between 25 and 20 million years ago, these valleys were filled with river gravels and reworked dune sand that had been caught up in floods. The Ugab was one such river and the old valley fill of sand and gravel can be seen in the terraces on the north bank of the river on the farm De Rust 532 immediately north of Brandberg and in the lower part of the 100m high Ugab River Terraces that occur just north of the river and stretch from Outjo to the Summas Mountains. The Omaruru is another of these rivers. Its deposits are also just north of the river and extend from Neineis to Henties Bay. The river containing the uranium deposit just south of Langer Heinrich is yet another. The latter still contains all the Tsondab-age debris since it was never re-incised like the other rivers. This river cuts through the Bloedkoppie granite which contains about 10 parts per million of uranium. Slow weathering of the granite has released the uranium and transported it downstream where it was redeposited.

The early Kuiseb River, along with the Tsondab River, first manifested itself during a wetter period about 17 million years ago as a broad shallow valley cut into the relatively soft Tsondab sandstones. It did not cut through the sandstone to the hard basement rocks underneath. Heavy summer rainfall inland and along the escarpment and regular flash flooding transported pebbles of all the
rock types in the catchment areas downstream and deposited them all along its path and out onto the Tsondab sandstone. These river gravels extend to within 10km of the sea. Similar gravels were deposited on top of the older valley fill in the Ugab River valley.

Then followed a period about 12 million years ago with hot, wet summers but very little torrential rains since the geological record shows very little evidence of flooding at this stage. Winters were dry. As a result of the high rainfall, the river gravels were saturated with water to just below the surface and probably contained numerous open pools all along their length. The hot summer temperatures and the dry winters caused evaporation and increased the concentration of lime in the water to the point of supersaturation. The result was the deposition of white surface limestone (calcrete) as cement in the gravels and sands of all these river valleys. With time all the river gravels as well as some of the underlying Tsondab sandstones became completely cemented by the groundwater calcrete. Hard, calcrete-cemented, boulder-choked river gravels of this period can be seen all along the top of the Ugab Terraces and in many places along the highest parts of the lower Kuiseb River gorge.

This wet period was also responsible for the deposition of a great deal of calcrete in other places. Limestone and dolomite is soluble in acid. Rain water is very slightly acidic because of the atmospheric carbon dioxide dissolved in it. This slightly acidic rainwater, in dissolving a tiny bit of the limestone or dolomite it falls on, produces the ribbed "elephant-hide" texture that is so typical of these rocks. More dramatic but less obvious, however, is the solution of these rocks along fractures on and below the surface. In time, the rocks become riddled with open fractures. Huge underground caverns can be dissolved out underground (e.g. Dragon’s Breath Cave near Otavi). A sinkhole results when the roof of one of these underground caverns collapses. This process is referred to as karsting. Much of the rain that falls in karst areas simply disappears underground and feeds what is normally a huge reservoir of underground water. Often springs appear along the contacts between karsted and less pervious rocks, especially if the former form a ridge and the latter lowlying terrain. Springs may also be common in mountains built of limestone and dolomite. That part of northern Namibia from Grootfontein to Kamanjab, Sesfontein and Ruacana is one long, continuous karst region in limestones and dolomites of the Otavi Group. Over the whole of this region springs will have been present at the base of ridges or broader mountain belts of limestone and dolomite. Some examples of such ridges are the Fransfontein Ridge between Otjo and Fransfontein, the ridges NE of Kamanjab, the mountains around Warmquelle and Sesfontein and the ridge north of Opuwa which runs westwards from Ombarundu to the Onjara Mountains. Some springs still
occur along the base of these ridges and mountains. However, most are now buried under their own thick deposits of calcrete. This calcrete built up as the lime in the water of the open spring was precipitated during evaporation. As the deposit of calcrete built up, there was less and less open water on surface. Instead it flowed down-slope away from the spring itself either within or at the base of the calcrete blanket. Often it flowed out into the open again where the calcrete blanket ended. In this way the calcrete blanket spread over large areas and became very thick in places. All the ridges North-East of Kamanjab have such blankets extending out from their bases, as does the southern edge of the ridge from Omburanud to the Onjaraka Mountains. A spectacular sheet of calcrete that formed in this way, is that south of the Fransfontein ridge which was and still is fed by many springs along the base of the ridge. This sheet covers over 1 500 km² and extends over 50km south of the ridge to the farm Zebraaskop on the Ugab River. The calcrete is 70 m thick at Braunfels, 20km south of the ridge, where boreholes that supply Khorixas with water are located. The water table is just 5m below surface at Braunfels. In this same area, the spring at the house on the farm Tsawisis 2 is an example of the water that flows out at the end of the calcrete blanket. Most of the old springs are probably still present below the calcrete at the base of the limestone/dolomite ridge. The calcrete, being a limestone itself, also develops its own karst cavities and sinkholes, the latter being represented by shallow, tree-lined pans.

The summer rains of this period also appear to have fallen somewhat more frequently in a semiarid Namib than they do today, possibly as much as 400 mm/year (Yaalon and Ward, 1982). Such rain always dissolves a small amount of lime from the limestone grains in the sand dunes and then re-deposits it as calcrete a centimetre or two below surface as the moisture in the sand evaporates under the burning desert sun. Slowly, a layer of calcrete (pedogenic calcrete) between 20cm and 2m (rarely 5m) thick built up forming a hard, weather-resistant crust just below the surface of dunes and soils over a very extensive area. Pedogenic calccretes of this age are widespread and well developed along the lower reaches of the Kuiseb Canyon. Similar calccretes occur in many flat-lying areas in the North-West region, but since there have been several periods of more recent pedogenic calcrete development it is usually very difficult to ascribe an age to a specific calccretised surface.

9.4.3 LATER STAGES OF DEVELOPMENT OF THE WESTERLY FLOWING RIVERS

Slowly and conditions re-established themselves and about 5 million years ago, apparently in response to uplift of the continent, the westerly flowing rivers began to incise strongly. The Kuiseb River cut down through the pedogenic
calcrete, through the Tsondab Sandstone and, for the first time, began to cut into the underlying hard bedrock.

At the same time, the Orange River and the other westerly flowing rivers built large deltas out into the ocean. The northerly long-shore drift of the Benguela Current carried the sand in the deltas back onshore, where the southwesterly winds picked it up from the beach and blew it back inland to form the dunes of the modern Namib erg and dune belts. The present erg south of the Kuiseb River has been described as the displaced Orange River delta.

A pause in the riverine incision process at about 2 million years is marked by elevated terraces and river gravels 50m above the present bed of the Kuiseb River. Similar terraces and gravels have been recognised in the Swakop, Khan, Omaruru, Uls, Ugab, Huab, Koigab, Unib, Karugaiseb, Hunkab, Engo and Kunene River valleys (Ward, 1987). In the Kuiseb and Kunene Rivers they contain interbedded dunes which point to conditions very similar to those of today.

The penultimate riverine deposits are the fine-grained sediments of the Homeb Silt Formation in the Kuiseb River and the sand castles in the Hoarusib River. These were deposited at locations where large floods lost some of their energy when they emerged from narrow sections of the valleys into wider, less confining stretches. The deposits are made up of fine riverine silts with interbedded layers of dune sand that had been blown into the river bed upstream and then transported along by the flood waters, i.e. in exactly the same way that dune sand is washed down the Kuiseb River today. Similar deposits occur in the Swakop, Omaruru, Huab and Hoanib River valleys.

The final deposits are orange-coloured river gravels that form a terrace 2m above the present river bed. Rolled Middle Stone Age artifacts occur in these gravels in the Kuiseb and Swakop Rivers (Ward, 1987). Similar deposits occur in the Omaruru, Uniab and Hoarusib Rivers.

**9.4.4 DESERT SOIL PROFILES**

As one travels westwards across the desert, one finds that at a point about 40km from the coast, calcretes are no longer present and the top soil becomes soft and porous. This change is caused by the precipitation of gypsum (calcium sulphate) and not calcrete (calcium carbonate) in the soil. Calcrete is the product of the reaction of lime in any moisture in the soil with carbon dioxide in the air. The coastal fogs, however, carry small amounts of sulphate from decaying organic matter inland. The sulphate probably makes the fog more acid
than rainwater. As the fog moistens the ground, any calcrete that might be present is easily dissolved by the acidic moisture releasing lime. This lime reacts readily with the sulphate to form gypsum. The growing gypsum crystals lift the soil and make it very porous. This is a slow process that takes place over hundreds of years so that any disturbance, such as vehicle tracks, will take just as long for nature to repair.

9.4.5 DESERT PAVEMENTS

If one looks closely at the floor of the desert plains, one notices that the surface is covered with rather large rock fragments from 3mm up to several centimetres in size. These rest on finer grained material underneath but there is no fine-grained material right on surface. Such surfaces are produced by the desert winds. All the top fines are blown away and a lag deposit of coarser grained material is left which is abundant enough to protect the fines underneath from also being blown away. If the winds are strong enough, the coarser material will be rolled along thus exposing the fines below. In this way, quite a thickness of coarser material accumulates.

In the desert, there are also little telltaile signs on apparently sand-free plains that reveal the prevailing wind directions even on windless days. Each little stone or bush sticking up from the surface forms a barrier. Windblown sand accumulates on the lee side of such barriers in the form of small shadow dunes. Thus, the southwesterly winds and the east winds each produce their own sets of shadow dunes. Shadow dunes of fine-grained sand are easily moved when the wind direction changes. However, shadow dunes and westerly faced sand ripples up to 5cm high of coarse-grained material are produced only by the strong east winds in winter. They survive unchanged throughout the summer because the southeast winds are not nearly as strong.

Loose pebbles of hard rock types such as dolerite, quartz and quartzite that occur on the desert plains in areas where high winds are frequent become intensely sand blasted. As a result, abraded surfaces oriented in the main wind directions form on the pebbles to produce what are called "Zweikanters" and "Dreikanters."

9.5 GEOLOGICAL EXCURSIONS AND TRAILS

Some of the Namibian geology is well known internationally and for certain things we have some of the best localities in the world. Thus, the Damara Orogen is classical and it is easy to demonstrate all its evolutionary stages in the field. The acid Etendeka pyroclastic rocks are another classic and probably better exposed than in most places.
Their origin is still controversial and not necessarily well understood. Thus, many volcanologists try to get to see them. Messum, Okenyenya and the Matchless Belt have also generated a great deal of interest. The turbidites of the lower Ugab River are another classic and several of the world’s top turbidite experts have come here to see them. The Otavi Group rocks are generating a great deal of interest at present. Many international field excursions of up to ten days duration have been undertaken to all these features and will continue to be undertaken in the future under the leadership of Namibian experts or international research scientists from Europe, the UK and the US who continue to work here. Some overseas mineral collectors have led groups of their colleagues on special mineral collecting tours to Namibia. Stops included Gorob (for staurolite crystals). However, these tours were never widely advertised and even seem to have been a bit secretive at times.

Thus, for the professional geologist there is a great deal of interest in most of the North-West region. However, as the above description ought to indicate, an understanding of how various features formed can also be interesting to the layman and tourist. Tour leaders could be made aware of the above geological facts but with specific reference to the routes and trails they lead. Tours could include visits to old mines (as long as these are safe) or mineral deposits. Many places that are scenically attractive are also geologically interesting. Therefore, it would probably be worthwhile to prepare descriptions of the geology – Kuiseb River, the Namib dunes, Matchless Belt, Gorob and Hope, Tinkas, Bloedkoppie, Kaltenhausen, Wilsonfontein, the Namib plains, the Khan River Gorge, Rössing Mine, Navachab Mine, Erongo, Spitzkoppies, Cape Cross, Messum, Brandberg, Uis, the lower Ugab River, Okenyenya, Otjongundu Plateau.

Photo 2: Burned Mountain
Otjhorongo Granite, Ondundu, Twyfelfontein, Verbrandeburg, Organ Pipes, Petrified Forest, Karoo of the Awahab area, the calcretes south of the Fransfontein Ridge (and any others on well travelled routes, the Ugab Terraces, the Etendeka rocks from Grootberg to the Goboboseb Mountains, copper deposit at Mesopotamie west of Khorixas, Sesfontein, Warmquelle, the dywka glacial valleys and their present-day rivers, Hoanib River valley, Hoarusib, Orupembe area, Hartmannberge, Epupa, Swartbooisdrift sodalite, Zebra Mountains and other mountains in the Kockoveld.

9.6 TRAIL DESCRIPTIONS

Well used tour routes or trails, such as the Ugab River trail, could have flora, fauna and the geology to be seen described in a route or trail booklet in order to increase interest and awareness. Butterflies should be included because they are often very attractive but so usually not noticed at all. There are a few endemic species that are rather common in places. Even large, conspicuous moths could be described. These booklets should be cheap.

9.7 COMMUNITY PROJECTS

Some mineral deposits are mined by small groups of the local inhabitants, mainly for mineral specimens. Many of these small miners make a very poor living. Some mineral deposits, such as Ondundu, are not mined at all. There are quite a number of people who would love to go out and find their own mineral specimens. If the necessary permits and approvals could be obtained from the authorities, it might prove viable for some small miners, if they were willing, to allow tourists and weekend visitors, at a price, to dig for mineral specimens on their claims. Such tourists and visitors would then be allowed to keep the specimens they find. The possibilities include agates and other minerals in the gas cavities anywhere in the Etendeka lavas but particularly between Grootberg and Tafelberg, quartz crystals and prehnite in the Goboboseb Mountains, nambulite (a very rare copper mineral) on the farm Mesopotamie 504 west of Khorixas, topaz and other minerals at Spitzkoppies, gamets in the Hartmannsberge and gold at Ondundu. The latter might be the most viable of all because of the romance of panning for and finding gold. However, special arrangements would have to be made, firstly with the authorities because of the law regarding the possession of precious metals and secondly because the claim owners, who are really interested in the gold underground, would have to be persuaded to allow panning to take place and to permit the local community to manage and benefit from this. Other mineral deposits, such as those with tourmaline, could be approached in the same way. (See Map 901)

The well formed staurolite crystals which occur in the Gorob area could also be turned into a similar form of revenue for the Topnaars of the Kuiseb River.
9.8 MINING ACTIVITIES

9.8.1 ACTIVE MINES

The five active mines in the northwest region (Map No 902) and their projected remaining lives are:

<table>
<thead>
<tr>
<th>Mine</th>
<th>Remaining Life (years)</th>
<th>Commodity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rössing</td>
<td>+ 10</td>
<td>Uranium</td>
</tr>
<tr>
<td>Navachab</td>
<td>6</td>
<td>Gold</td>
</tr>
<tr>
<td>Cape Cross Salt</td>
<td>+ 10</td>
<td>Salt</td>
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<tr>
<td>Salt Company</td>
<td>+ 10</td>
<td>Salt</td>
</tr>
<tr>
<td>Salt and Chemicals</td>
<td>+ 10</td>
<td>Salt</td>
</tr>
</tbody>
</table>

All are open pit mines at present. Navachab may develop further as an underground mine, in which case its life will extend beyond 6 years. Rössing and Navachab both generate waste rock that is dumped outside the open pits. Navachab is rehabilitating as it mines. Rössing has a rehabilitation plan and is accumulating funds for rehabilitation at the end of the life of the mine. The latter is actually a major tourist attraction and hosts several thousand tourist visitors every year.

9.8.2 QUARRIES

Quarries for dimension stone (rock cut into slabs and used for floor tiles or cladding of buildings) (Map No 902) are listed in the following table:

<table>
<thead>
<tr>
<th>QUARRY</th>
<th>LATITUDE</th>
<th>LONGITUDE</th>
<th>FARM/LOCALITY</th>
<th>DISTRICT</th>
<th>OPERATOR</th>
<th>PRODUCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walvis Bay</td>
<td>23° 01' S</td>
<td>14° 36' E</td>
<td>SW Rookkop</td>
<td>Walvis Bay</td>
<td>Damara Granite</td>
<td>Granite</td>
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<tr>
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<td>22° 58' S</td>
<td>14° 35' E</td>
<td>Rookkop</td>
<td>Walvis Bay</td>
<td>Damara Granite</td>
<td>Granite</td>
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<tr>
<td>Spitz-koppe</td>
<td>21° 54' S</td>
<td>15° 01' E</td>
<td>Klein Spitzkoppe</td>
<td>Usakos</td>
<td>African Granite</td>
<td>Granite</td>
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<tr>
<td>Aus</td>
<td>27° 21' S</td>
<td>16° 29' E</td>
<td>Lüderitz</td>
<td>Aus Marble</td>
<td>Marble</td>
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<td>15° 34' E</td>
<td>Gamikaub</td>
<td>Karibib</td>
<td>Palisandro</td>
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<td>West 115</td>
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</tbody>
</table>

Generally, activity at quarries is intermittent and depends on how quickly production is sold. Once sufficient blocks have been removed from a quarry to satisfy demand for a few years, equipment is dismantled and moved to the next quarry. When supplies from the first quarry run low, the equipment will be moved back and quarrying resumed. Most quarries have produced a considerable amount of large, angular, unsightly waste blocks that are left scattered around the quarry. Very little attention appears to be paid to minimising the waste and to rendering it less unsightly. Policy on quarrying should require better control and the exclusion of quarrying in the immediate area of features of high tourist activity, e.g. Spitzkoppies.
9.8.3 POTENTIALLY COMMERCIAL MINERAL DEPOSITS

The potentially commercial mineral deposits (Map No 902) in the NW region are:

<table>
<thead>
<tr>
<th>Deposit</th>
<th>Commodity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ondundu</td>
<td>Gold</td>
</tr>
<tr>
<td>Goantegab</td>
<td>Tin</td>
</tr>
<tr>
<td>Tsonguari</td>
<td>Lead, zinc</td>
</tr>
<tr>
<td>Namib Lead</td>
<td>Lead, zinc</td>
</tr>
</tbody>
</table>
| Others possible if the area is more actively prospected.

9.8.4 POLICY ON MINING IN THE NORTH-WEST REGION

Mining has been the mainstay of the Namibian economy for most of the past century. The economy has not diversified as it should have in terms of sustainable development. Money generated by mining is needed to fund the needs of promoting sustainable development and of sustainable development itself. The North-West region has significant mineral potential and thus potential for the discovery of commercial mineral deposits. Prospecting and mining should be encouraged but in terms of environmental contracts that prospectors must now sign and in terms of forthcoming legislation. Full EIAs and Environmental Management Plans and the regular compliance with, auditing and updating thereof in order to continuously strive to reduce impacts must be requirements of any new mining venture.
10. LEGISLATIVE, INSTITUTIONAL AND ENVIRONMENTAL FRAMEWORK FOR TOURISM DEVELOPMENT IN THE COMMUNAL AREAS OF THE KUNENE AND ERONGO REGIONS

10.1 INTRODUCTION

The North-West region, comprising the Kunene and Erongo regions (the study area), has been identified by the MET as a high potential tourism development area. The fragile environment and currently uncontrolled tourism in the study area necessitates that a comprehensive and usable tourism master plan be formulated. This plan aims to simultaneously prevent negative impacts of unplanned and uncontrolled tourism and meet the goals and objectives of communities in the focus area. Planning should ensure sustainable tourism development that:

- respects and actively involves local communities in planning and management;
- creates social and economic incentives for sustainable natural resource management;
- maintains the natural environment;
- delivers a quality visitor experience.

Tourism planning can be viewed as a form of economic development planning that is directed towards tourism-related objectives. Economic development planning is primarily concerned with facilitating the development of various industries and sectors. It should address the following issues:

- the need to have a common vision, direction and commitment for tourism established through a participatory process of involving all stakeholders;
- the socio-cultural and environmental impacts of tourism and the need for a long-term perspective in assessing such impacts;
- the resource problems faced by communities that may not have a legal framework or skilled work force to create a service-based industry;
- the survival of tourism destinations in an increasingly competitive market;
- the need to respond to the rapid pace of change in the tourism industry;
- the need to provide the private sector, especially those providing investment funds, with a level of stability and security.

10.2 BACKGROUND TO THE STUDY

The Kunene and Erongo Regions consist of communal and commercial land as well as National Parks. The agricultural potential of the regions has in most areas been reached, if not exceeded. The eastern part of the study area is well suited to livestock
production with some arable agriculture. The extreme west is arid and not suitable for livestock production. The focus area, (communal areas) is mostly marginal for agricultural activities. The mining and manufacturing potential is low. Distance to markets and the inaccessibility of the regions reduces the profitability of these activities further.

Tourism, however, is not necessarily limited by inaccessibility and in some cases the further away and more inaccessible the destination, the greater its potential tourism value. Potential therefore exists to compliment local economies with income from tourism, particularly in the west, which has high tourism potential but low agricultural potential. The study area forms part of an important Namibian tourism destination and is supported by world-renowned destinations including Etosha National Park and Swakopmund. The focus area itself has equally well known attractions, including the Himba culture, Epupa Falls, the desert-adapted elephant, rhino and other wildlife as well as the unspoilt appeal (wilderness value) of the western section of the focus area.

Well established and expanding wildlife populations, historic sites, diverse culture, wilderness, spectacular scenery, ephemeral rivers and geological formations add value to the tourist experience. Other activities, such as fishing along the west coast and hunting are also draw-cards for the area.

10.3 PROBLEM STATEMENT

The Government recognised the potential of this area more than a decade ago and several tourism concessions were awarded to tour operators in the focus area. Since this time however, the tourism market in the focus area, Namibia and world-wide has boomed.

This boom has been effectively harnessed in Etosha, Swakopmund and latterly the commercial farms of the study area. These areas were fortunate in that their protected area or freehold status allowed for a planning process and framework within which the tourism could develop. In contrast however, the communal areas, although highly attractive to tourists both locally and internationally, still lack status or legislation that provides a planning framework to be initiated and implemented.

This has resulted in too little control for the high volume of tourism being experienced in the focus area. Only limited regulation of tourist movement is possible under the present legislation. Enterprise development is taking place in a haphazard and unplanned manner, without sufficient consideration paid to local and regional impacts. This is having serious negative effects on the environment and many sub-standard enterprises are emerging, which over the long term will negatively impact on the value of the destination as a whole. Local residents and leaders are negotiating with
commercial operators to establish lodges without seeking legal and financial advice. Invariably, the deals do not reflect the economic potential of the area, the rights of local residents nor the equitable distribution of income. Operators with good intentions are also unsure as to which process to follow. There is also a generally poor understanding of the tourism industry amongst local residents, but an eagerness to gain the skills associated with it.

In the communal areas, tourists can move anywhere in the communal areas, camp anywhere and pay nothing to the local residents for this privilege. This is particularly disturbing in areas where local residents have for a decade or more been actively conserving wildlife. In turn the incentive for local residents to value the tourist resource at their disposal and therefore ensure its wise management, is undermined. In general, tourists are prepared to pay but want assurances that this money is being legitimately collected and utilised within a transparent system.

These problems are compounded by the fact that the most environmentally sensitive areas are often the most attractive to tourists. For instance, the gravel plains in the far west of the focus area could take over 100 years to recover from the tracks of a single vehicle driving over them. These vehicle tracks have a serious impact on the wilderness experience and therefore on visitor satisfaction. The open-access status of the area combined with tourists lack of awareness on how to behave within sensitive areas, often leads to irreparable damage to the environment without the tourists realising it.

10.4 THE SOLUTION

The focus area, over the long term, is on course for a tourism disaster. Such disasters continue to be witnessed in other parts of the world and if this is to be avoided the present trends must be reversed by decision-makers at a local, regional and national level. The challenge faced by regional planners will be to provide a framework that affords adequate control of tourist movement and development but does not detract from the unique, wilderness appeal of this area. At the same time, local involvement, and the link between sustainable natural resource management and benefits must be made. This needs to be done in a way that takes into account the needs of local, regional and international tourists.

In order to move forward, a vision for the development of tourism is required. It is proposed that the vision for the north-west and particularly the focus area, should be to maximise tourism potential in the north west in a sustainable manner that allows:

- local communities to work in partnership with government and the private sector
• maximum economic benefits and entrepreneurial opportunities for local residents and Namibians as a whole
• a quality destination to be created which Namibians can be proud of
• the social and economic empowerment of local communities
• environmentally and socially sustainable tourism to be promoted
• regional, national and international tourism links are maintained or improved

The purpose of the NWTMP is to provide a framework for decision-makers at a local, regional and national level to realise this vision. At the same time inequalities that have occurred in the past and issues particular to communal area tourism management need to be addressed.

The framework that is provided through this study, is not a detailed implementation plan for the study area. The study area is simply too large and the tourism industry and needs of each area too complex, to produce a detailed action plan. Detailed tourism plans need to be compiled at a local level within the framework provided by this document. The plan should develop:

• a regional framework within which local tourism planning should take place;
• a suggested planning process for local communities;
• a legal framework to facilitate the development of plans which are then legally enforceable.

This report provides recommendations for a national and regional framework within which tourism development should develop locally. At a national level, recommendations are related to the legislative requirements. Regionally, recommendations are largely based on environmental limitations to tourism development, local institutions and a planning process.

10.5 NATIONAL FRAMEWORK

10.5.1 LEGISLATIVE RECOMMENDATIONS

Legislation related to the communal areas of Namibia changed in 1996 when the MET introduced its Communal Area Conservancy Legislation. This addresses discriminatory legislation on communal land, but more importantly promotes better management of wildlife, ensures the equitable distribution of income and a diversification of local economies through the consumptive and non-consumptive utilisation of wildlife. This change, although difficult, has been adopted by the majority of communities within the focus area, who have either been awarded status, are working towards meeting the conservancy requirements or have requested assistance to do so. Four conservancies are
registered and at least eleven conservancies have started meeting the requirements and numerous others have requested assistance.

Conservancies, once registered, can apply for hunting farm status and non-consumptive tourism concession rights. Hunting farm status allows the commercial utilisation of wildlife and concession status allows some regulation of tourism infrastructure and registered tour operator movements within the area. This control is inadequate and no provision is made for the regulation of self-drive tourists, who can drive and camp anywhere they please.

In a similar way it is envisaged that the right to control, manage and benefit from tourism would be awarded to communities that structure themselves in a way that promotes responsible tourism development. Rather than creating another structure it is recommended that the existing MET conservancy approach to wildlife be adopted for tourism. In essence, before rights to benefit from tourism are obtained, the community must have organised itself in such a way that tourism can be managed sustainably together with government. Such an approach will make provision for a structured approach to tourism development, including planning at a local level and the existence of a legal institution with greater security to negotiate with operators. It also requires accountability and transparency towards its members and government, which will reduce corruption. The best institution for this would be the conservancy framework already in existence within the MET.

It is important that a communal framework, acting in the interests of the entire community, be developed as tourism development has a limit or carrying capacity. Once the tourism carrying capacity is reached, further tourism development will reduce the viability of the existing tourism operations in the area and should therefore not be approved. To avoid conflict among residents from occurring, it is important that all members need to have an equitable stake in the tourism enterprises of the conservancy. Entrepreneurs should be encouraged to run these enterprises until the carrying capacity is reached, after which entrepreneurs should be encouraged to become involved in secondary activities, possibly using conservancy capital as start-up. The conservancy approach allows this.

The conservancy type approach to tourism will allow effective participatory planning by members who have decided to work together. This provides a platform to better integrate tourism and wildlife planning with other ministries and to extend management beyond wildlife to include other natural resources. However, these plans are not enforceable, which makes resource management
difficult and reduces investor security in the tourism industry, which in essence, means that investors will negotiate to pay less to conservancies.

This conservancy approach will also promote better resource management, better tourist/community member relations and promote entrepreneurial activities within the tourism and other industries.

The institutional framework at a local level is in place to deal with tourism planning and control. The problem at present is rather the lack of appropriate supporting legislation to allow these institutions to effectively plan, implement and manage tourism in their areas. In the focus area emerging and registered conservancies have undertaken several participatory planning processes. Sesfontein community and Khoadi Hoas Conservancy have completed land use plans, and Khoadi Hoas has recently accessed funding and appointed a consultant who has assisted them to drawn up their tourism plan. Torra Conservancy has started formalising their land use plan with the MET and plans to do a tourism plan. These plans, although based on sound consultation of communities and sound environmental and economic grounds, cannot be enforced under the present legislation. This means that a single member from within or outside of the conservancy may jeopardise the common good of the majority for his/her own self-interest. Plans established by consultation in the best interest of the majority need to be enforceable if planning and sustainable resource management are to be taken seriously.

10.5.2 RECOMMENDATIONS

The main legislative recommendation of the study area is that the draft Tourism Act makes provision for the establishment and enforcement of:

- Conservancies to be adopted as the institutional framework for tourism development on communal land in the Kunene and Erongo Regions.
- Conservancy land use and tourism plans are drawn up by the conservancies themselves, approved by the MET and supported by regional government.
- Conservancies can apply to the MET for tourism areas to be designated by the Minister of MET for special protection status.
- Conservancies may draft regulations for controlling and enforcing tourism activities within the conservancy, which are approved by the MET and supported by regional government.
- Conservancy concession rights are strengthened to promote better control.
- Planning frameworks such as the NWTP become enforceable, ensuring that local planning takes into account a regional perspective.
- The PTO application process outlined in this document be adopted.
The Kunene River west of Epupa has great potential for wilderness tourism. The scenic beauty of the area coupled to the fact that the Kunene River is the only permanent waterway in the north gives the area a very high tourism potential. This area is environmentally highly sensitive to uncontrolled tourism and therefore requires careful planning and regulations governing use.

The zone continues down the west side of the Etendeka Mountains, passing to the east of Dubis, east of Palmwag (along the main Sesfontein to Palmwag road), west of Twyfelfontein, east of the Brandberg Mountain, east of Spitzkoppe and joins the Namib-Naukluft Park boundary south-east of Arandis.

Environmentally this area is the most highly sensitive. The zone receives an average annual rainfall of between 0-50mm with a high degree of variability. The ability of this environment to recover from change or disturbance is poor. In addition, the environmental durability or its ability to cope with low levels of persistent stress is also poor. The present infrastructure in the zone is limited in the north with few access roads and most of these are in poor condition, while in the south a much better infrastructure exists. On the proclaimed public roads it is neither possible nor desirable to restrict the movement of tourists. Large parts of this area are not suitable for livestock production and habitation is limited to the eastern parts of the area. This allows parts of this zone to be zoned for exclusive tourist development by restricting tourist access to maintain the wilderness appeal of this zone. Zone I should be developed as a low impact, low tourism volume zone. Overseas, upmarket and local and regional needs need to be accommodated within this framework.
10.6.3 ZONE II – TRANSITION OR DEVELOPMENT ZONE

In the north the zone starts at Ruacana, passes to the south of the Zebra Mountains, east of the Steirlandberge ridge and west of Opuwo. Then, along the mountain range east of the Khwarib Schlucht, along the east edge of the Grootberg Mountains, east of Verbrandeberg, east of Us, through Tubussis, Usakos, continuing south to the border of the Namib-Naukluft National Park.

This zone is a transition or buffer area between the highly sensitive (low impact, low tourism volume zone), Zone I, in the west and the higher intensity zone (Zone III) in the east and corresponds to 50-100mm rainfall zone. This zone is far more capable of coping with disturbance than Zone I, however as the area still exhibits a relatively low rainfall with a high degree of variability and would require more stringent environmental management than Zone III. This zone has a more open access with several main roads passing through it and higher populations and stock numbers. The area north of the Ugab River has high tourism potential. Tourism facilities should be promoted in this zone to support zone I. This will preserve the wilderness appeal of the zone I and promote development where people are living. The development of moderate volume, low impact tourism should be promoted in this zone. This zone should cater for upmarket, mid market and budget tourists.

Photo 4: Typical Landscape in Zone II: In Vicinity of Grootberg
As in Zone I the northern areas do not follow the 50-100mm rainfall zone. This is the buffer or development zone and the Kunene River with its high tourism potential needs more careful planning, particularly if the road between Epupa and Ruacana is upgraded.

10.6.4 ZONE III – LEAST SENSITIVE ZONE TO TOURISM DEVELOPMENT

This zone has the capacity to cope with a higher intensity of tourism and corresponds to the greater than 100mm rainfall zone. The environment is much more durable and can cope with a higher level of disturbance. A well developed infrastructure already exists, the population density is relatively high and the area is well suited to livestock farming. In general this area has a lower tourist appeal. All forms of sustainable tourism should be encouraged to develop within this area. This zone covers the rest of the focus area.

10.7 REQUIREMENTS FOR TOURISM DEVELOPMENT IN ZONES I, II, III.

In line with accepted procedures for the development of sensitive environments the following environmental criteria would have to be assessed before tourism developments are approved:

(a) Strategic environmental assessment (SEA)
(b) Needs assessment
(c) Limits of acceptable change

The intensity and importance that would be placed on each would depend on the zone in which the proposed development is to take place. This can be summarised in Table 10.1.

Table 1. Requirements for tourism development in the major sensitivity zones. X – negligible importance; XX – minor importance; XXX – moderate importance; XXXX – major importance

<table>
<thead>
<tr>
<th>Requirement for tourism development, special emphasis being placed on:</th>
<th>Zone I</th>
<th>Zone II</th>
<th>Zone III</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) Biodiversity</td>
<td>XXXX</td>
<td>XXXX</td>
<td>XXX</td>
</tr>
<tr>
<td>(ii) Endangered species</td>
<td>XXXX</td>
<td>XXXX</td>
<td>XXX</td>
</tr>
<tr>
<td>(iii) Wilderness value</td>
<td>XXXX</td>
<td>XXX</td>
<td>XX</td>
</tr>
<tr>
<td>(iv) Ephemeral river catchments</td>
<td>XXX</td>
<td>XXXX</td>
<td>XXXX</td>
</tr>
</tbody>
</table>

Needs assessment:

| (i) Economic | XXXX | XXX | XXX |
| (ii) Social | XXXX | XXX | XXX |
| (iii) Demand | XXX | XXX | XXX |

| Limits of acceptable change: | XXXX | XXX | XX |
| (i) sense of place | XXXX | XX | X |
| (ii) wildlife | XXXX | XXX | XXX |
| (iii) cultural | XXXX | XXX | XXX |
| (iv) physical | XXXX | XXXX | XXXX |

10.7.1 STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA)

The strictest SEA would need to be carried out in Zone I and lesser degrees in the other two zones. Each SEA carried out in each of the zones would need to place special emphasis on the following environmental concerns:

(i) bio diversity
(ii) endangered species
(iii) wilderness value
(iv) ephemeral river catchments

The biodiversity and endangered species of any area are major concerns to any development plans and must be taken into account and mitigated for, before any development can occur in any of the zones.

The wilderness value is a more difficult concept to evaluate and will depend on the type of tourist and tourism that is likely to be attracted to a zone. Zone I, due to its susceptibility to disturbance, lack of infrastructure and its isolation would attract a certain type of tourist who is after a “wilderness experience”. As it is difficult to mitigate for loss of wilderness experience any proposed development in Zone I would need to minimise the infrastructure and be unobtrusive. In Zones II and III infrastructure already exists in these areas with unrestricted access to most areas, therefore the wilderness value is necessarily depleted. Any tourism development in these zones should seek to minimise further depletion of wilderness value and environmental disturbance.

The effect of any development on the ephemeral river catchments needs to taken into account. Not only in terms of scenic appeal but extraction of water by upstream developments can have a serious affect on the availability of water for downstream users. As the ephemeral rivers approach the coast, water extraction does not pose the same problem as large-scale extraction in upstream areas. For this reason the strictest assessments on the effects on catchments needs to be undertaken in Zones II and III. The extraction of water
by tourism developments near river wetlands and springs should also be strictly controlled in all zones, but tourism development near adjacent wetlands may decrease downstream water volume.

10.7.2 NEEDS ASSESSMENT

While many large-scale tourism development projects would carry out needs assessments as a matter of course, many smaller operations especially at a community level, are developed by individuals without feasibility studies being done. As the market reaches saturation a needs assessment becomes all the more important. To reduce the risk of establishing non viable enterprises it should become mandatory to conduct a needs assessment including:

(i) economic
(ii) social
(iii) demand

Again the strictest requirements for the needs assessment are for Zone I. Initially, development in all zones will be governed by the economic viability of the project. This will ensure that only projects, that the market can support, will survive. Tourism development should be not be approved unless economically viability is assured.

There may come a time if tourism continues to grow that communities no longer wish to have tourists disrupting their day to day lives and wish to restrict the numbers of tourists within an area. This level of tolerance will have to be determined by the local communities themselves and use their own bye laws to restrict tourism development, access or practices within an area.

The demand for a development is linked to economics. If the market demand is not there then no development should be established. A consolidation of what is currently available and whether or not they are coping with demand should be a prerequisite before any further development can occur within an area.

10.7.3 LIMITS OF ACCEPTABLE CHANGE (LAC)

An integrated monitoring programme is vital to the successful management of the North West region of Namibia. This programme should identify where visitor pressure is compromising the quality of the environment or visitor experience. There are two main ways of dealing with excessive tourism impact. The first is to set limits to the maximum use of an area and the second is to set limits of acceptable change.
Carrying Capacity refers to the maximum use of any site without causing negative impacts on the resources, reducing visitor satisfaction or exerting adverse impacts on the society, economy or culture of the area.

Carrying capacity limits are extremely difficult to quantify. Carrying capacity limits also vary according to the season and factors such as tourists' behavioural patterns, facility design and management, the changing attitudes of the affected communities and the dynamic character of the environment.

It is thus recommended that the technique of Limits of Acceptable Change ("LAC") be used to monitor tourism impacts on the environment. LAC should define management actions that would be triggered in response to defined signs of visitor pressure or wear. These limits should be established during the conservancy tourism-planning phase.

During local (conservancy tourism) planning the impact of tourism on various factors should be assessed with consideration being given to the following:

- road condition;
- disturbances to important sites;
- the condition of the vegetation or soils;
- wildlife populations;
- pressure on sites such as queues, car parking, litter and other pollution;
- the impact of visitors on local communities; and
- visitor satisfaction levels.

In order for LAC principles to be successful, regular and consistent, qualitative and quantitative data is required on all the above elements.

It is recommended that wherever possible local communities should be trained to interpret and monitor the quality of the visitor experience and any other signals of visitor pressure. The regional MET offices together with Regional Government should ensure that this is being done and that adequate mitigation is being implemented to cope with increasing tourism levels.

10.7.3.1 ROADS

Vehicle movement, road construction activities and particularly the noise associated with this, may disturb nomadic animals, such as elephant and rhinoceros, thereby forcing them to take alternative routes between foraging and drinking sites.
Use and maintenance of roads can result in a decrease in the aesthetic appeal of the area, this will apply to upgrading existing roads and especially to the development of new roads. Improvements in the roads infrastructure could bring about:

a) an increase in traffic which in turn will increase disturbance to wildlife especially rhinoceros and elephants
b) an increase the number of road kills,
c) an increase the amount of undisciplined off-road driving resulting in the disturbance to environmentally sensitive areas
d) more heavy duty and light duty traffic, faster average travelling speeds and hence increased rate and severity of accidents.
e) More unsightly borrow pit development

Any signs of visitor pressure on roads such as excessive erosion, destruction of surrounding environment, aesthetic value, etc, that may indicate that the conservation value of the region is being threatened should be considered. If the area is being adversely affected then mitigating measures need to be put in place such as limiting the number of visitors to the area, improving the quality of the road to accommodate more visitors, increasing the number of roads to spread the visitor pressure, etc. Guidelines developed for the skeleton coast park should be considered particularly relating to the establishment of borrow pits, location of and behaviour of construction and road maintenance crews.

10.7.3.2 DISTURBANCE TO SENSITIVE SITES

Natural attractions open to the public need to be monitored for visitor damage e.g. breakages, damage to the surrounding area, illegal removal of items, graffiti, pollution, etc. Any damage beyond predefined levels should indicate that visitor numbers to the attraction should be reduced or mitigation measures need to be introduced to reduce the negative impact of visitors.

10.7.3.3 CONDITION OF VEGETATION AND SOILS AND WILDLIFE POPULATIONS

Visitor impacts that negatively affect the ecology (vegetation, soils, wildlife, etc) of the region e.g. fires caused by visitors, disturbance to habitats, changes in vegetation, decreasing wildlife populations, etc, should be monitored and visitor numbers decreased if no appropriate mitigation measure can be identified to minimise the negative visitor impact.
10.7.3.4 VISITOR PRESSURES

Visitor pressures which have an adverse effect on the conservation of the region as well as visitor satisfaction levels such as queue lengths, litter and pollution levels and vehicle parking facilities, should be monitored. Predetermined tolerance levels should be identified and mitigation measures developed. In the event that these levels are exceeded i.e. the development of additional entrance points to reduce queue lengths, improved information and the supply of additional waste disposal facilities to decrease littering and the development of additional parking facilities to reduce irresponsible vehicle parking, etc.

10.7.3.5 VISITOR SATISFACTION LEVELS

To monitor visitor satisfaction levels and hence the overall visitor experience it is recommended that surveys of visitors to the region be conducted. These surveys should address the visitor’s overall experience whilst visiting the area as well as the nature of the visit. Hospitality employees should be trained to monitor visitor reactions and interpret satisfaction levels by behaviour patterns, visitor requests and complaints or complements. It is recommended that visitors be encouraged to complete questionnaires at the end of their visit or stay in the region.

10.7.3.6 VISITOR IMPACTS ON LOCAL COMMUNITIES

The economic effect of visitors to the region on the local communities should be monitored. The impact should be monitored every 2-years by community sample surveys to determine the number of local people employed within tourism facilities as well as the average household income of the area. Ongoing employment levels can be tracked via the operators of facilities and associated hospitality serves.

10.7.3.7 SENSE OF PLACE

Refers to the tourist wilderness experience. This value decreases as more and more people come into contact with one another in the area. This is a difficult parameter to measure, but visitor satisfaction levels and target markets need to be monitored to ensure visitors levels do not drop. Obviously not all tourist come to the area to experience the “sense of place” but market evaluations will pick up if the type of tourist visiting the area changes and for what reason.
10.7.3.8 WILDLIFE

This would refer to the disturbance of wildlife by tourists. The "flight distance" i.e. the distance, at which animals run away when they see a person or a car, varies depending on the disturbance factor from humans. Breeding rates of the more endangered species and aggressive behavioural changes should be monitored. Regional monitoring of wildlife numbers will give a good indication of the performance of other wildlife species.

10.7.3.9 CULTURAL

Increasing tourism can disrupt the culture of the people in an area. It can cause a loss of identity, change in lifestyle and loss of heritage, which is deemed to be unacceptable. These limits to tourism numbers or access can be accommodated in the local conservancy planning process.

10.7.4 PROBLEMS ASSOCIATED WITH LAC

There are some problems associated with the use of LAC and these include:

(i) availability of qualified persons to undertake monitoring and evaluation
(ii) training of persons to undertake evaluations
(iii) implementation of any changes required for maintenance of LAC
(iv) coordination of monitoring and evaluation process
(v) management structure required to enforce any proposed changes
(vi) initial cost associated with training of qualified staff and management infrastructure

10.8. ALLOWABLE TOURISM INFRASTRUCTURE

Due to the different sensitivities of the various zones identified some tourism infrastructure should be avoided in some zones and promoted in others. The limitations are largely a result of environmental considerations and aim to make the best use of the land taking into account its fragility and sensitivity. Table 10.2 presents a summary of effect of the different types of tourism in the sensitivity zones.

Table 10.2: Guidelines for allowable tourism infrastructural developments in the major sensitivity zones. X – negligible effect; XX – minor effect; XXX – moderate effect; XXXX – major effect.

<table>
<thead>
<tr>
<th></th>
<th>Zone I</th>
<th>Zone II</th>
<th>Zone III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small scale tourism development</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(i)</td>
<td>Community campsites</td>
<td>XXX</td>
<td>-</td>
</tr>
<tr>
<td>(ii)</td>
<td>Luxury tented camps</td>
<td>X</td>
<td>-</td>
</tr>
<tr>
<td>(iii)</td>
<td>mid-market tented camps</td>
<td>XX</td>
<td>-</td>
</tr>
<tr>
<td>(iv)</td>
<td>luxury lodge</td>
<td>X</td>
<td>-</td>
</tr>
<tr>
<td>(v)</td>
<td>mid-market lodge</td>
<td>XX</td>
<td>-</td>
</tr>
</tbody>
</table>

**Medium scale tourism development**

| (i)   | community campsites | XXXX | XX | X  |
| (ii)  | luxury tented camps | XX   | X  | X  |
| (iii) | mid-market tented camps | XXX | X  | X  |
| (iv)  | luxury lodge        | XX   | X  | X  |
| (v)   | mid-market lodge    | XXX  | X  | X  |

From an environmental perspective the type of development best suited to Zone I would be low volume, high priced tourism in the form of luxury-tented camps and lodges. In this zone the establishment of further community campsites would be discouraged and existing campsites generally kept on a small scale. The main aim would be to concentrate development in zone two where people are resident, with self or guided tours being done into Zone I from these camps. The reason for this is to discourage large volumes of self-drive campers from using this section of the country. The establishment of dry camps within Zone I should be considered on certain routes.

All tourism developments within this zone would be required to use environmentally friendly practices, i.e. solar electricity, gas cookers, removal of all wastes, no mechanical repair facilities, etc. Before any development could take place a full EIA would need to be undertaken including considerations such as water, waste management roads development, use of construction materials and similar concerns.

For Zones II and III very few environmental restrictions would be needed in addition to the SEA, Needs Assessment and established LAC’s for area. However, as has been stated for the developments in Zone I, an EIA would still need to be carried out before any development could take place. Many aspects of the EIA need not be as strict as for Zone I, but an EIA with special emphasis being placed on the extraction of ground water should be mandatory for any developments in Zones II and III. Medium scale developments would be allowed in all other areas. Nowhere in the study area is high volume, high impact tourism recommended.

### 10.9 ALLOWABLE VEHICLE MOVEMENTS

The focus area has two distinct management zones in terms of vehicle movement. Most of Kunene and the northern section of the Erongo districts are developing tourism areas, while the Erongo Region has well established tourism industry. In already
developed areas it is very difficult to change existing tourism habits and beliefs while in developing areas the chance exists to set standards before habits become entrenched and then expected. The allowable vehicle movements in each zone are summarised in the Table 10.3.

**Table 10.3: Guidelines for allowable vehicle movements in environmentally sensitive zones.** X - negligible effect; XX - minor effect; XXX - moderate effect; XXXX - major effect.

<table>
<thead>
<tr>
<th>Tourism activity</th>
<th>Zone I</th>
<th>Zone II</th>
<th>Zone III</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) overland trucks on established routes</td>
<td>XXXX</td>
<td>XX</td>
<td>XX</td>
</tr>
<tr>
<td>(ii) 4x4 self-drive tourists on established routes</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>(iii) 4x4 guided safaris on established routes</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>(iv) 2x4 self-drive safaris on established routes</td>
<td>XXXX</td>
<td>XXX</td>
<td>XXXX</td>
</tr>
<tr>
<td>(v) motorbikes on established routes</td>
<td>XXXX</td>
<td>XXX</td>
<td>XXXX</td>
</tr>
<tr>
<td>(vi) overland trucks on off road</td>
<td>XXXX</td>
<td>XXX</td>
<td>XXXX</td>
</tr>
<tr>
<td>(vii) 4x4 self-drive tourists off road</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(viii) 4x4 guided safaris off road</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(ix) 2x4 self-drive safaris off road</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(x) motorbikes off road</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As already discussed, vehicle movement and roads maintenance brings with it numerous environmental concerns and these need to be taken into account in the alignment and management of the roads infrastructure. Existing tracks are susceptible to degradation, particularly on alluvial soils and gravel plain areas. Overland trucks are particularly damaging. For the purposes of this report, off-road driving refers to driving anywhere there are no graded gravel roads or demarcated tracks. Off-road driving should be forbidden in Zone I and be discouraged in all other zones with the exception of the guided safaris in Zone III, where it is expected that the tour operator be responsible to cause minimum amounts of environmental damage.

10.10 ALLOWABLE TOURIST ACTIVITIES

The tourism activities discussed in this section are not an exhaustive list, but rather examples of the type of tourism that should be allowed in each of the zones and their
environmental impact. Decisions on the types of tourism activities undertaken, will need to be defined in a sub-regional plan, done at conservancy level. Table 10.4 is a summary of the types of activities and their effects.

Table 10.4: Guidelines for allowable tourism activities in environmentally sensitive zones. X - negligible effect; XX - minor effect; XXX - moderate effect; XXXX - major effect.

<table>
<thead>
<tr>
<th>Tourism activity in potential tourism areas</th>
<th>Zone I</th>
<th>Zone II</th>
<th>Zone III</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) driving hunting</td>
<td>XXXX</td>
<td>XXX</td>
<td>XX</td>
</tr>
<tr>
<td>(ii) walking hunting</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>(iii) wildlife monitoring (off-road)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- visual</td>
<td>XX</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>- wilderness</td>
<td>XXXX</td>
<td>XXX</td>
<td>XX</td>
</tr>
<tr>
<td>(iv) flying</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- microlights</td>
<td>XXX</td>
<td>XX</td>
<td>X</td>
</tr>
<tr>
<td>- light aircraft</td>
<td>XXX</td>
<td>XXX</td>
<td>XX</td>
</tr>
<tr>
<td>- helicopters</td>
<td>XXXX</td>
<td>XXXX</td>
<td>XXXX</td>
</tr>
<tr>
<td>(v) walking trails</td>
<td>XX</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>(vi) horse/donkey/camel safaris</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>(vii) bicycle</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

The activities recommended in Zone I are all low impact, low volume with minimum environmental disturbance associated with them. Walking based activities including hunting and trails (horse, donkey, camel, walking, and bicycle) are all highly recommended. Practically this would mean the establishment of these activities from camps or parking areas outside of Zone I, then proceeding into the wilderness areas. Consideration needs to be given to the impact of back up vehicles and routes to be taken. Limited infrastructure should be built in Zone I to accommodate these activities, with the majority of development taking place in Zone II. Flying in Zone I should be by light aircraft only and be on direct routes to destinations within the zone. Flying at low levels down the riverbeds and joy-flights should be restricted. Micro-lights and helicopters flights in this zone should be restricted and only permitted in demarcated areas that would not interfere with other tourist's enjoyment of the zone. Wildlife viewing by tourists should be kept to established routes with no new routes should be created, off-road driving to view wildlife should be strictly forbidden. Self drive tours would need to be considered in the local planning framework.

Wildlife and environmental monitoring will be necessary to establish LAC's, law enforcement and carry out research activities. This does not mean that those involved
should have free access to all parts of the zone. No off-road driving should be allowed without good reason and those involved in these activities should be restricted to recognised tracks and established routes. Off road, vehicle based hunting in this zone should be strictly forbidden. If an animal is shot, the hunter is responsible for carrying the carcass back to an established route before using a vehicle to remove it.

Zone II and Zone III activities are similar to those described for Zone I, but restrictions are less severe. Vehicle based hunting should be permitted in certain areas, but with severe restrictions as to where vehicles can travel off road. Aircraft movement would be less restricted, but not to detract from other tourist's enjoyment of the zone. Environmental monitoring would be less restricted, but off-road driving should still be discouraged.

In the already established tourism areas, for example the coastal region south of the Ugab River, the restrictions placed on tourism activities should be less environmentally stringent. Tourism activities are already well established in this area by both Namibians and foreign tourists. The environmental damage caused in these areas is still high. Although difficult, planning at a local level needs to be done to address the already established and uncontrolled tourism in these areas. At present this is impractical due to limited legislation, better infrastructure, higher population densities and established activities.

Even though tourism patterns are established in this zone, any further developments should be environmentally friendly. All off-road vehicle activities should not be allowed in Zone I and discouraged in all other zones. Recreational fishing along the coast has many problems associated with it, not the least of which are the destruction of coastal dunes and plant hummocks. The Swakopmund Municipality and other consultancies are already investigating this problem and their recommendations should be adopted into any development plan for this area. The more intrusive tourism activities (flying, wildlife viewing and monitoring and driving hunting), should be dealt with at a local level, either by the relevant local authorities or where they exist conservancy committees through their tourism management plan.

10.11 MANAGEMENT ZONES

Within the three sensitivity zones, management zones were identified. These sub-areas allow a more detailed analysis of the zones described above. The management areas are shown diagrammatically on Map No 1002. The main proposed tourism routes, infrastructure, activities and exceptions are discussed here in more detail to provide a framework for local tourism planning. Links with adjoining regions and parks are also discussed. The management zones have been used to identify areas of similar tourism use and potential. These comments should be taken into account when local conservancy tourism planning (sub regional planning) is done. Each conservancy plan
should take into account the regional perspective. These management zones A to M are briefly discussed below.

10.11.1 AREA A

This area is located in Zone I and takes in the north-western section of the study area and includes areas such as the Kunene River west of Epupa Falls and south to Purros. The northern section of this area includes both the Baynes Mountains and the Kunene River.

In this area any tourism development should be subjected to the strictest environmental conditions. However, several main tourism routes already exist in the area and these should be maintained and promoted. Indeed, it is probably more practical to expand and upgrade the existing camps and facilities along environmental guidelines. Subsequent tourism developments should be subject to the stringent environmental concerns. LAC’s would need to be established which would complement sustainable tourism development, but not cause any detrimental environmental affects. Cultural tourism is a strong draw-card for this area and should be promoted and formalised.

Recommended tourism infrastructure for establishment – low volume, low impact tourism

- a small number of luxury tented camps and lodges
- Where appropriate, expand the existing infrastructure to mid-market lodges, tented camps and community camp sites, preferably at existing areas of development (Purros and Orupembe).
- upgrading of already existing camp grounds to accommodate mid-market tourists.
- Campsite in the Hartmans valley.
- The area east of the Marienfluess developed to maximise wilderness appeal.

Recommended vehicle movements – low volume, low impact.
The main self drive route to be promoted should be from Purros to Orupembe to Opuno through the Hoarusib Valley or Otjitaanda. The route north from Orupembe should favour the eastern route through the mountains as opposed to the one through the gravel plains.

- overland trucks should be allowed on proclaimed roads only
- 4x4 self drive and guided tours on established routes only
- no off-road driving
- limited access to motorcyles, only on proclaimed roads
- promote the type of control presently found in the Marienfluess, in the Hartman Valley.

Recommended tourism activities – low volume, low impact

- all walking activities, i.e. walk trails; horse, camel, donkey trails; bicycle trails
- walking hunting (under supervision of a professional hunter)
- flying should be minimised so as not to disturb other tourists
- wildlife monitoring should be undertaken by either government offices, official researchers or community representatives and be kept to a minimum. Researchers would need a Research Permit issued by the Ministry of Environment and Tourism. Off-road monitoring should be done on foot rather than from a vehicle.
- Motorised boating on the Kunene River should be avoided.
- Guided tours into more sensitive areas including the Skeleton Coast National Park

10.11.2 Area B

This area includes the most environmentally unspoilt areas of the study area. The area extends from the Hoarisib River in the north to the Ugab River in the south and includes Brandberg Mountain. It contains the highest numbers of endangered, endemic and threatened species as well as several unique habitats. In addition to plains game the area contains both “desert elephant and rhino” that are currently the major draw card for tourism in this part of the northwest.

At the present time there is a lack of infrastructure that limits and concentrates tourism into certain areas. The main tourism route in this area is from Sesfontein to Purros with secondary routes along the Hoanib River and Ugab Rivers. One gravel road bisects the area and runs from the Springbokwasser gate of the Skeleton Coast Park to Bergsig. Any tourism development in this area should be subject to the strictest environmental measures with low volume, low impact tourism being preferred to any other form of tourism. Of all of the management areas discussed in this report this area is the one that most lends itself to the establishment of LAC. Here an initial carrying capacity should be established, then as monitoring and management systems are established in implemented within the conservancies that border the area, the “carrying capacity” can be reviewed.
Recommended tourism infrastructure – low volume, low impact tourism

This area has one upmarket fly in lodge and one campsite

- a small number of luxury tented camps and lodges
- a small number of "dry fly-camps" to cater for self drive and guided tours
- no camping facilities in the river beds or around wetlands
- a campsite near the main road at Springbokwasser for tourists missing the closing times of the Skeleton Coast Park.

Recommended vehicle movements – low volume, low impact

- no overland trucks on established routes, only on proclaimed roads.
- 4x4 guided tours on designated routes only
- 4x4 self drives on only a limited number designated routes
- no off-road driving
- limited access to motorcycles, only on proclaimed roads

Recommended tourism activities – low volume, low impact

- all walking activities, i.e. walk trails; horse, camel, donkey trails; bicycle trails
- flying should be minimised so as not to disturb other tourists
- wildlife monitoring should be undertaken by either government offices, official researchers or community representatives and be kept to a minimum. Researchers would need a Research Permit issued by the Ministry of Environment and Tourism. Off-road monitoring should be done on foot rather than from a vehicle.
- Specialised tours
- Guided and self drives
- Guided tours into the Skeleton Coast Park.
- Walking hunting

10.11.3 AREA C

The southernmost area in Zone I and is also one of the most complicated to manage. While environmentally it is still located in the most sensitive zone, it is subject to more disturbance than any of the other zones. The population centres of Swakopmund and Walvis Bay are located here and recreational use of the area is well established by both local Namibians and foreign visitors. The problems associated with the unrestricted use of the coast are well documented and part of another consultancy (Inter-coastal Zone Management Plan) that is currently nearing completion. Tourist safety needs to be addressed in this zone.
Infrastructure is well developed in this area and access to most areas is by well-maintained gravel or tarred roads. The environmental restrictions associated with any potential tourism development would be less than in any other area in Zone I. Proposed developments would still need to carry out the strategic environmental assessment, needs assessment and LAC monitoring, but the requirements for development would be less stringent and more consideration given to disturbance that has already occurred in the area.

Recommended tourism infrastructure – medium volume, medium impact tourism
- luxury tented camps and lodges
- mid-market lodges, tented camps and community camp sites
- upgrading of already existing camp grounds to mid-market facilities along environmentally acceptable lines

Recommended vehicle movements – medium volume, medium impact
- no restriction on vehicles using established gravel or tarred roads
- off-road driving in designated areas only

Recommended tourism activities – medium volume, medium impact
- all walking activities, i.e. walk trails; horse, camel, donkey trails; bicycle trails
- driving and walking hunting (under supervision of a professional hunter)
- flying should be avoided over environmentally sensitive areas
- Either government offices, official researchers or community representatives should undertake wildlife monitoring. Researchers would need a Research Permit issued by the Ministry of Environment and Tourism.
- 4x4 driving activities in certain areas only
- Fishing with control of off road driving
- Circular routes from the main centres to accommodation in the north of area C to take day visits into Area B on guided trails.

10.11.4 AREA D

Located in Zone II, area D, borders the Kunene River and the Zebra Mountains, as has already been stated the area is one of high environmental concern. Infrastructure in the area is limited but it is proposed that the road between Epupa and Ruacana be upgraded to allow for link road to be established to Etosha National Park and the Omusati Region. Should this occur then tourism developments in the area are likely to increase. Future developments should be
subject to a moderate level of environmental concern, with more mid-market lodges and campsites being established in the area. While low impact tourism activities would still be preferred in this zone, it does lend itself to higher impact tourism, i.e. 4x4 routes. Cultural tourism in this area is a strong draw-card and should be encouraged in a more structured way.

Recommended tourism infrastructure – medium volume, low impact
There is one traditional village and one upmarket lodge in the area.
- luxury tented camps and lodges
- mid-market lodges, tented camps and community camp sites
- upgrading of already existing camp grounds to mid-market facilities along environmentally acceptable lines

Recommended vehicle movements – medium volume, low impact
The main routes in this area are from Ruacana to Epupa and from Okangwati to Epupa. Both of these routes are either being upgraded or are planned for upgrading. This will form an important link with tourism developments in Omusati, Oshana and other regions and a circular route from the prospective opening of the King Nehale Gate (formerly Andoni), Epupa and the western areas.
- overland trucks on established routes
- 4x4 guided tours and self drives on gravel roads and established tracks
- motorcycles subject to the same rules as 4x4 drivers
- off-road driving in designated areas and routes only

Recommended tourism activities – medium volume, low impact
- Cultural tourism structured and formalised.
- River activities formalised
- all walking activities, i.e. walk trails; horse, camel, donkey trails; bicycle trails
- driving and walking hunting (under supervision of a professional hunter)
- flying should be avoided over environmentally sensitive areas.
- Wildlife numbers need to be promoted to improve the value of 4x4 trails.
- Either government offices, official researchers or community representatives should undertake wildlife monitoring. Researchers would need a Research Permit issued by the Ministry of Environment and Tourism.

10.11.5 AREA E

This area is located south of the Zebra Mountains, adjoins Area A on the west and is north of Sesfontein, in the east the boundary follows the Epupa to Opuwo road
and continues along the Opuwo to Sesfontein road. This area has poor infrastructure and few attractions. There is very little wildlife currently in this area and scenically it is not as spectacular as other areas in the region. There is considerable potential for cultural tourism which should be encouraged and formalised.

Recommended tourism infrastructure – medium volume, medium impact
This area has one camp site
- luxury tented camps and lodges
- mid-market lodges, tented camps and community camp sites
- upgrading of already existing camp grounds to mid-market facilities along environmentally acceptable lines

Recommended vehicle movements – medium volume, medium impact
The main tourism routes are from Ondupamba through the Hourisib River to Opuwo and from Opuwo or Okongwati down Van Zyls Pass into the Marienfluss. Instead of upgrading Van Zyls pass it may be better to upgrade the shorter pass between Otjithanda and Ondupamba. This will allow a circular route from Opuwo to Epupa to the West but allowing the Marienfluss and Hartmann Valley to remain more exclusive.
- overland trucks on established routes
- 4x4 guided tours and self drives on gravel roads and established tracks
- motorcycles subject to the same rules as 4x4 drivers
- off-road driving in designated areas and routes only

Recommended tourism activities – medium volume, low impact
- cultural tourism
- all walking activities, i.e. walk trails; horse, camel, donkey trails; bicycle trails
- driving and walking hunting (under supervision of a professional hunter)
- flying should be avoided over environmentally sensitive areas. Low flying over wildlife should be restricted.
- Wildlife numbers need to be promoted to attract controlled 4x4 market.
- Either government offices, official researchers or community representatives should undertake wildlife monitoring. Researchers would need a Research Permit issued by the Ministry of Environment and Tourism.

10.11.5 AREA F

This area extends from Sesfontein in the north to Palmwag in the south and in the west, Dubis to the Palmwag- Sesfontein road, in the east, along the eastern side
of the Etendeka Mountains to the veterinary fence. The infrastructure in this area is limited. A number of tourism facilities and two concession leases already exist in the area, before any additional developments occur an evaluation and consolidation of the tourist industry should occur. The area has a number of drawcards including wildlife, scenery, culture and historical significance.

Recommended tourism infrastructure – medium volume, low impact

There are three established lodges and one in the process of construction, five campsites and two traditional villages.

- luxury tented camps and lodges
- mid-market lodges, tented camps and community camp sites
- upgrading of already existing camp grounds to mid-market facilities along environmentally acceptable lines
- Further development in this area should be done preferably only once the existing camps are upgraded. Exceptions could be completing the lodge which has started, a market built in Sesfontein, a facility established at the entrance to the Hoanib river, and a mid market facility at Khowareb.

Recommended vehicle movements – medium volume, low impact

- overland trucks on established routes
- 4x4 guided tours and self drives on gravel roads and established tracks
- motorcycles subject to the same rules as 4x4 drivers
- off-road driving in designated areas and routes only

Recommended tourism activities – medium volume, low impact

- all walking activities, i.e. walk trails; horse, camel, donkey trails; bicycle trails
- driving and walking hunting
- flying should be avoided over environmentally sensitive areas. Low flying over wildlife should be restricted.
- Either government offices, official researchers or community representatives should undertake wildlife monitoring. Researchers would need a Research Permit issued by the Ministry of Environment and Tourism.
- Consumptive use of wildlife
- Guided tours into Area B
- Specialised tours

10.11.7 AREA G

This area extends in the north from Palmwag to the Ugab River in the south and includes areas such as Tywelffontein and the Petrified Forest. The area has a
number of draw-cards including both scenery and wildlife. The road infrastructure
is well established in this area and a number of the sites are on already
established coach and self drive tourism routes.

Recommended tourism infrastructure – medium volume, low impact
There is one joint venture lodge and one campsite with several planned
upmarket lodges in the pipeline.
- luxury tented camps and lodges
- mid-market lodges, tented camps and community camp sites
- upgrading of already existing camp grounds to mid-market facilities
  along environmentally acceptable lines
- as with Area F further development in this area should not be done
  before a tourism plan is commissioned at a local conservancy level.

Recommended vehicle movements – medium volume, low impact
This area forms a part of the link between the main tourism route from
Swakopmund to Etosha and from here to the north.
- overland trucks and coaches on established routes
- 4x4 guided tours and self drives on gravel roads and established tracks
- motorcycles subject to the same rules as 4x4 drivers
- off-road driving in designated areas and routes only

Recommended tourism activities – medium volume, low impact
- all walking activities, i.e. walk trails; horse, camel, donkey trails; bicycle
  trails
- driving and walking hunting
- flying should be avoided over environmentally sensitive areas. Low
  flying over wildlife should be restricted.
- Either government offices, official researchers or community
  representatives should undertake wildlife monitoring. Researchers
  would need a Research Permit issued by the Ministry of Environment
  and Tourism.
- Guided tours into Area B
- Specialised tours
- Consumptive utilisation of wildlife

10.11.8 AREAS H, L AND M

These areas have been grouped together as they have similar environmental and
tourism characteristics. These areas have relatively high populations, have good
infrastructure and high domestic stock numbers. This area has few tourism
attractions of international appeal, a low wildlife population and only a limited
number of scenically attractive areas. However, potential does exist for some cultural tourism and this should be further investigated. Environmental restrictions to tourism development in these areas should be kept to a minimum. The only exception to this would be extraction of water from the ephemeral river catchments as large-scale extraction for tourism facilities would detrimentally affect downstream users.

Recommended tourism infrastructure – medium volume, medium impact
- luxury lodges
- mid-market lodges
- community camp sites

Recommended vehicle movements – medium volume, medium impact
- off-road driving is restricted to designated areas only

Recommended tourism activities – medium volume, high impact
- any environmentally sustainable tourism activity

10.11.9 AREA I

This area is located south of the Kunene in the north east section of the study area. This area is the least environmentally sensitive area. At the present time very little tourism development has taken place outside the main town of Opuwo. Very little wildlife exists in this area but large populations of people and cattle are found here. The potential does exist for cultural tourism and there are several areas where the scenery could act as a major draw-card. The environmental restrictions to development would be kept to a minimum in this area, except for large water extraction projects.

Recommended tourism infrastructure – medium volume, medium impact tourism
There are two rest-camps, a camp-site and a craft market in Opuwo.
- luxury tented camps and lodges
- mid-market lodges, tented camps and community camp sites
- improvement of the services offered in Opuwo as a centre for tourism in the northern area of the study.

Recommended vehicle movements – medium volume, medium impact
Opuwo forms an important logistic point for many routes in the north of the Kunene Region
- driving on designated tracks only
- no further restrictions
Recommended tourism activities – medium volume, low impact
- any sustainable tourism activity
- formalisation of the cultural tourism taking place
- attention to tourist safety

10.11.10 AREA J

The area extends from Okaturu in the north to the veterinary fence in the south. Similar environmental and tourism conditions exist here as for Area I with the exception in the south. This area has significant populations of wildlife. Elephant’s range both north and south of the Ombonde River while most of the antelope species, giraffe and rhino populations are found to the south between the Ombonde River and the veterinary fence. This area has a significant potential for both consumptive and non-consumptive tourism. The northern section of this area should have very few environmental restrictions associated with it while the southern section should have stricter environmental restrictions.

Northern Section:

Recommended tourism infrastructure – medium volume, medium impact
- luxury tented camps and lodges
- mid-market lodges, tented camps and community camp sites

Recommended vehicle movements – medium volume, medium impact
- driving on existing tracks only

Recommended tourism activities – medium volume, low impact
- any sustainable tourism activity

Southern Section:

Recommended tourism infrastructure – medium volume, low impact tourism
- luxury tented camps and lodges
- mid-market lodges, tented camps and community camp sites

Recommended vehicle movements – medium volume, low impact
- no overland trucks on established routes
- 4x4 guided tours on designated routes only
- 4x4 self drives on only a limited number designated routes
- no off-road driving
- limited access to motorcycles, only on maintained gravel roads
Recommended tourism activities – medium volume, low impact

- all walking activities, i.e. walk trails; horse, camel, donkey trails; bicycle trails
- driving and walking hunting (under supervision of a professional hunter)
- flying should be avoided over environmentally sensitive areas. Low flying over wildlife should be restricted.
- Either government offices, official researchers or community representatives should undertake wildlife monitoring. Researchers would need a Research Permit issued by the Ministry of Environment and Tourism.
- Consumptive utilisation of wildlife

10.11.11 AREA K

This area extends from the veterinary fence in the north to the Ugab River, including the main population centre of Khorixas. This area has a large population of both people and domestic stock and a good infrastructure. In addition the area has a number of scenically attractive areas and large numbers of wildlife in certain areas. Elephants, rhino, giraffe and most of the plains game can be found along the Huab River. Environmentally the area is in the least sensitive zone and tourism should be encouraged. Special attention in this area needs to be paid to the extraction of water from the ephemeral river areas as the Huab River drains a much lower rainfall catchment than the other northern ephemeral rivers.

Recommended tourism infrastructure – medium volume, medium impact tourism

- luxury tented camps and lodges
- mid-market lodges, tented camps and community camp sites

Recommended vehicle movements – medium volume, medium impact

- off-road driving in designated areas and routes only

Recommended tourism activities – medium volume, low impact

- any sustainable tourism activity
11. COMMUNICATION AND MANAGEMENT STRUCTURE

11.1 INTRODUCTION

According to the regional Councils Act of 1992, the regional Council has the power to undertake the planning of a Region with a view to the geographical, physical, social and economic characteristics of the Region. In the planning process, the Council has to take into account: demographic matters, natural resources, development potential, infrastructure, the general land utilisation pattern and the sensitivity of the environment. Planning will obviously have to take into account national planning strategies, policies and laws as well as local planning in the region. Generally it could be said that the primary responsibility of the regional Council is regional planning. Tourism planning would be one part of this responsibility.

Although the Kunene and Erongo Regional Councils will play an important and determining role in management and planning of tourism development in the focus area, other role players such as ministries, traditional leaders and conservancy committees cannot be ignored. The Regional Council should, however, be the prominent institution in managing and guiding tourism development within the framework of the guidelines set out in this report.

Tourism planning in the study area entails more than just planning on a regional scale. Sub-regional and local development plans are of utmost importance. Institutions such as conservancy committees will play an equally important role in planning and managing of tourism on a local and sub-regional level. The responsibility of the Regional Council would be to make sure that planning takes place within the guidelines of the regional framework.

11.2 REGIONAL STRUCTURE

All land within the focus area (communal land) belongs to the Namibian Government. Allocation of rights or “permission to occupy” (PTO) are being administered and finally allocated by the Ministry of Land and Rehabilitation on behalf of the Namibian Government. This is if land is located outside the boundaries of a settlement or village in which case an application will be referred to the Ministry of Regional and Local Government and Housing.

The Ministry of Land and Rehabilitation is not involved in day-to-day management of land in the different regions and therefore rely on comments and support from the Regional Council. The Regional Council on the other hand is not always involved in
local “politics” and community issues and it relies on inputs and support from community leaders and conservancy committees if in place.

Guidelines or a process for approval of applications for development by prospective investors are not clear at this stage. Development in the Kunene Region has commenced on various occasions on approval by local headmen. This, without final recommendation or approval by the conservancy committee, Regional Council or Ministry of Lands and Resettlement.

Different opinions exist on which process to follow for consideration and approval of an application for development. The absence of conservancies in certain areas within the focus area, even worsen the situation.

During a workshop held in Swakopmund on 27 June 1999, attended by traditional leaders, Regional Councillors, Ministries, Municipalities and NGO's, it was agreed that the process for the evaluation of applications as indicated in Figure 11.1 be recommended.

Figure 11.1: APPROVAL PROCESS
The process may be divided into two phases.

- Application for principle approval
- Final application supported by required documentation such as an EIA

Applications may apply to the relevant authority (conservancy committee or traditional leader) for principle approval of a development proposal. The conservancy committee or traditional leader will consider the application for further recommendation to the Regional Council. The Regional Council will evaluate the application in terms of local, sub-regional and regional development plans or guidelines. The Regional Council will set criteria and determine issues which must be addressed in the final application or may recommend that this application not be supported if in contradiction with existing planning guidelines. The guidelines are set out in chapter 6.

If the developer is confident that his proposal will meet the criteria for development and that he would be willing to invest more money in further investigations, such as and EIA, then a final application must be submitted to the conservancy committee or traditional leader for processing and recommendation to the Regional Council. The Regional Council may circulate this application to other institutions for comments if necessary for proper evaluation of the application. The Regional Council will make a recommendation to the Ministry of Lands and Rehabilitation for final approval.

Although conservancies are being seen as the leading party in local and sub-regional tourism planning, alternative processes should also be considered since areas exist where no conservancy is registered. The process to be followed in non-conservancy areas and conservancy areas are described in more detail in the following paragraphs.

11.3 NON-CONSERVANCY AREAS

In non-conservancy areas, the process for tourism development needs to follow the current legal land allocation process, which is also currently under review. It is recommended that the local traditional leaders and Regional Council (or Land Boards) and emerging conservancy committees where they exist should recommend tourism related PTO's to the MLRR who refers applications to the MET for recommendation and then approves or declines the application based on the MET recommendation. Under the present system PTOs should be issued in the name of the community rather than in the name of prospective developers. This will ensure a sharing of risk between the parties. The security of both parties can then be better protected by a contract negotiated between the parties concerned. The establishment of this contract should be consultative and involve emerging conservancy committees where they exist. Contracts should be signed by the traditional authorities and the regional council (or
Land Board) as well as emerging conservancies where they exist. The process of PTO allocation and establishment of contracts for tourism development must:

- be transparent
- deal with the equitable distribution of benefits
- be legally binding
- follow EIA and development protocols as outlined in this document
- adhere to local and regional tourism/landuse management plans
- be transferable to the conservancy committee once registered
- access legal and technical advice (particularly taking into account existing joint venture contracts)

Any agreements that are entered into by the traditional authorities and regional council (or Land Boards) will be binding and transferred to the conservancy committee once registered and implemented according to the constitution as laid out by its members. Funds should be kept in trust until conservancy registration takes place. PTO fees will be payable to the Land Board. Concession fees are an outdated form of tourism lease but where applicable they should be paid directly to the community by the investor. It is not recommended, but if tourism and wildlife are additionally taxed by the Land Boards, this should be in line with taxes associated with domestic livestock production in the area. It is important that the process outlined in non-conservancy areas mimics that of the conservancy process to ensure community and investor security over the long term.

11.4 CONSERVANCY ESTABLISHMENT

Wildlife is a communal resource moving between farms and conservancies. Tourists come to see and experience the area as a whole and seek appropriate accommodation to enhance the experience. It is important therefore to see the community as a whole and individual entrepreneurs as stakeholders in the tourism industry in the north-west. It is proposed that as for benefits from the consumptive utilisation of wildlife, that conservancies be used as the institution through which tourism is planned at a local level and regulated at a regional level in future by Land Boards and a national level by the MET. This is particularly important for further tourism development in the more sensitive zones. This should promote community involvement and maximise entrepreneurial involvement and ensure that development takes place in a structured fashion. If tourism development takes place prior to conservancy registration, then the emerging conservancy committee should be involved and include the same process outlined below. Conservancy committees are proposed as the lead institution and should ensure that:

- tourism planning takes place by members of the conservancy
- implementation of the plan is the primary responsibility of the conservancy members
- benefits from tourism are distributed equitably according to local needs
- the tourism product of the conservancy is the responsibility of the members
- conservancy staff can become actively involved in ensuring the sustainability of tourism levels
- the institution is legal and representative of the broader community allowing greater investor security through transparency and accountability
- the conservancy committee will be able to enter into legal contracts, to which the members and investor/entrepreneur will be bound.
- Responsibility for ensuring that wildlife and tourism planning is done and that these plans are realised.
- Before any tourism development occurs a potential investor would still need to carry out an EIA for the specific site to determine its effect on the natural resources of the area.

Conservancy establishment and running is the responsibility of all its members. Assistance from Government and non-governmental organisations in achieving this end will be required. Once registered it will be the task of each conservancy to realise the objectives as laid out in their constitutions. Conservancies once registered should apply for PTOs through the Regional Council (or Land Board) to the MLRR and approved based on the recommendation of the Technical Committee on Natural Resources. PTOs should be issued in the name of the conservancy and not individuals. As previously outlined investor and community security can be best obtained by legally binding contracts between the investor and the conservancy committee. The headman structure appears to have been left out in this process but they should be represented by their councillors on the conservancy committee. This should remain the decision of the conservancy members of a particular area and allow local conditions to be accounted for.

11.5 LAND USE PLANNING

In order to maximise returns from and sustainably manage natural resources in communal areas, it must be possible for local residents, to implement plans allowing different areas to be used to meet different needs. Zoning of all land use types is required in a holistic way to maximise the potential of the area taking all possible activities into account. These plans need to be established through a consultative approach and at present are the responsibility of the MLRR.

Planning is particularly important for tourism, where it is important to keep photographic tourists separate from trophy hunters, for example. Also, exclusive lodges accommodating high paying guests may need to be kept separate from convoys of
budget self drive tourists. Investors in exclusive lodges require that livestock belonging to conservancy members and neighbours are kept out of the lodge, or at the least are able to negotiate short-term emergency grazing provisions with the stock owners or conservancy committee.

Conservancies should take the lead in the tourism aspects of the planning process and that a cross-sectoral approach be adopted to ensure that all ministries support the plan and that regional government (and Land Boards) will assist in the enforcement of it. It is important that the MET is involved in the planning process and that the MLRR and land boards adopt these tourism and wildlife plans as part of the local land use planning process.

Like all plans, they need to be enforceable and supported by national legislation and/or local by-laws. The local plans for wildlife and tourism should be submitted to the MET and adopted by the MLRR, other line ministries and Regional Government and Land Boards.

11.6 CONSERVANCY TOURISM PLANNING

This planning should be done within the framework of the NWTMP. Detailed tourism planning should be done for the entire conservancy, taking into account the land use zones of the conservancy as well as the rest of the region. The aim of this planning is to utilise tourism expertise to ensure that the tourism potential of the area is maximised in a sustainable manner. In addition this planning is important to:

- Ensure that the potential of the conservancy as a whole is realised (negotiate realistic contracts with existing lodges, tour operators and self-drives).
- Ensure that non-viable and sub standard enterprises do not emerge or are upgraded.
- Replace the outdated concession approach.
- The value of the tourism resources are not set by speculators
- Make the conservancy aware of tourism options available to them, within the conservancy as well taking into account neighbouring and regional activities.
- Identify possible conflicts resulting from the proposed development.
- Identify the Limits of Acceptable Change or carrying capacity for each zone.
- Strategic environmental assessment and needs assessment is done for the whole conservancy.
- Priority tourism areas should be identified and submitted to the minister for approval
- Make recommendations regarding existing tourism facilities
- Make provision for the important local and Southern African self drive tourist component
- Institute tourism data collection systems to allow better future decision-making.
- Address local control issues.
• Make provision for EIA's for specific site development

This process, should be initiated by the conservancy, conducted by consultants and co-ordinated by an organisation such as NACOBTA with the support of the MET. The conservancy tourism plan could be done simultaneously with the land use planning process, or may include the tourism land use-planning component only. The conservancy and the MET will then discuss recommendations with the various line ministries including the MLRR (Land Boards). These plans should be formally adopted by MLRR (Land Boards)

11.7 ENTERPRISE DEVELOPMENT

Enterprises identified in the tourism plan and adopted by the MET should be developed with few additional requirements, with the exception of location specific EIA's undertaken by developers. The conservancy should then apply for the PTO's of the sites identified in the plan and register them in its name. These potential sites should then be put out on tender, evaluated and negotiations entered into with potential investors/entrepreneurs. This should culminate in agreements being signed between the conservancy and the entrepreneur after legal and financial advice has been sought to protect both the investor and conservancy.

Developments included in the conservancy tourism plan will not require further approval apart from the PTO applications. Developments which are proposed but not included in the tourism plan will require individual Strategic Environmental Assessment, Limits of Acceptable Change and Needs Assessment.

11.8 TRAINING

The approach outlined above ensures local empowerment, equity and skills transfer over the long term to communal residents. There is however a large training component required to achieve this end. Almost all stakeholders require training in the tourism sector and include communal residents, local entrepreneurs, conservancy committees, MET, Regional Council and other ministry officials. Training issues include:

• Greater awareness of the conservancy approach, the need for it and its implementation.
• The need for limiting long term tourist impact on the environment
• Greater awareness of the tourism industry as a whole
• Consultative approaches including planning and implementation.
• Monitoring the limits of acceptable change identified and implementing necessary mitigation
• Running and operating a tourist facility or service, particularly tour guides
• HIV/AIDS awareness
• Negotiating with the private sector

There is also the need for an awareness creation programme including:

• A national information programme informing Namibians of the local planning process
• Providing information to tour operators, self drive tourists on the sensitivity of areas, where certain activities are allowed etc.
• The necessity to deal with cultural tourism as outlined in the conservancy tourism plan
• The establishment of entry points at certain places to inform tourists of these issues

11.9 MONITORING PROCESS

The decision when to terminate further tourism development in any specific area, will always remain a difficult task. However, a process of monitoring and management is vital to the successful management of tourism in the North-West Region. The method proposed for monitoring tourism impacts on the environment is Limits of Acceptable Change. Limits of Acceptable Change should define management actions that would be triggered in response to defined signs of visitor pressure or wear. The indicators for monitoring are discussed in chapter 10.

The interpretation and monitoring of visitor experience or any other signals of visitor pressure cannot be implemented overnight. Training of local communities and implementing agencies such as Regional Councils and Ministry officials will have to take place.

The MET should establish a monitoring process and agency in consultation with the Regional Councils and Local Community Conservancy committees. The North-West Region covers a vast area with different environmental sensitivity zones and management structures. Each area has its own unique identity and may react differently to visitor pressure. The local communities or conservancy committees are probably the best placed to perceive environmental pressure or visitor satisfaction levels. However, members of the community will not necessarily have the experience and specialist knowledge to propose adequate mitigation to cope with the increasing tourism levels.

It is therefore recommended that an Environmental Monitoring Committee be established consisting of members from conservancies in the study area, Regional Council, Ministries, Private Sector, NGO’s and local community. This committee should
meet on a regular basis to discuss and handle matters of concern. Depending on the issues to be discussed, the Environmental Monitoring Committee may request assistance from technical advisors such as tourism, wildlife or environmental specialists.

The availability of qualified persons to undertake the monitoring and evaluation in Namibia might be problematic. This will even be more of a problem within the conservancy community. The MET in co-operation with NACOBTA have to invest in training of management and local people to monitor visitor satisfaction levels, to monitor environmental pressure and to implement changes required for maintenance of Limits of Acceptable Change.
12. ECONOMIC ANALYSIS

12.1 INTRODUCTION

The tourism master plan is considered to be a strategic plan and it is believed that the plan should not be too detailed or prescriptive but rather that broad guidelines should be recommended to assist decision makers at local level. The consulting team thus suggested that the comparative economic impact assessment should compare the possible types of tourism plant development in the area, via community campsites; mid-market lodges; and upmarket lodges.

This section thus compares the economic impact of community campsites and mid- and up market lodges on the local community and the region. This impact should assist local decision-makers in determining the type of tourism development allowed or promoted within their area of control. It allows planners and decision-makers the opportunity to consider various development options and their subsequent economic benefits. In this way planners can determine the ratio or models that would provide the greatest overall economic and other beneficial returns to their area.

It is important to realise that this is not intended to be a feasibility study. The objective of the study is to determine the comparative economic impact as well as the tangible and intangible benefits between a community campsite, mid-market lodge and an upmarket facility – applied broadly to the region. The objective is not to consider the financial viability of an individual project nor the demand for accommodation facilities in any particular area within the North West Region. A detailed market demand, financial feasibility and environmental impact assessment would need to be completed before any new development is considered.

In all cases it has been assumed that developers and/or investors would only consider the development of an accommodation facility if there is market demand for the facility and that the operation of the facility would yield a return on investment. Thus the comparative accommodation facilities considered in this model are not necessarily directly comparable to the current range of tourism plant in the region.

Throughout the comparative economic analysis average annual inflation has been assumed at 7%.

12.2 DEFINITIONS

The average community campsite considered in this model:
- Is owned and managed by the community;
- Has a minimum of two flushable toilets and two showers;
- Is managed at all times;
- Has a reception/administration office;
- Has campsites that are kept clear and tidy and ablution facilities that are operational and clean at all times;
- Has outdoor braai facilities at each campsite;

The average **mid-market lodge** considered in this model:
- Is a physical structure made of brick, reed, canvas, etc;
- Provides catered or self-catered accommodation;
- Provides beds and linen for guests;
- Has accommodation facilities that are preferably en-suite with a flushable toilet and bath or shower;
- Provides accommodation facilities are serviced daily;
- Is in the range of a 2- to 3-star accommodation facility;
- Is managed at all times and has a reception/administration office; and
- Should have community involvement in ownership.

The average **upmarket lodge** considered in this model:
- Is a physical structure made of brick, reed, canvas, etc;
- Provides catered accommodation;
- Provides quality levels of service;
- Provides beds and linen for guests;
- Has accommodation facilities that are en-suite with a flushable toilet and bath or shower;
- Provides accommodation facilities that are serviced daily;
- Is in the range of a 4- to 5-star accommodation facility;
- Is managed at all times and has a reception/administration office; and
- Provides guest activities.

### 12.3 COMMUNITY CAMPSITE

#### 12.3.1 BACKGROUND

Within the study area there are approximately 18 campsites, most of which are owned and operated by local communities. In general, these campsites are located at or near a riverbed, spring or other natural feature. Currently community campsites provide basic only facilities for campers. Development costs are generally very low. Demand for community campsites appears to be extremely low, however, in general, these facilities are neither marketed nor adequately signposted.
The economic impact assessment of a community campsite is detailed in Annexure A, pages 1 to 3.

12.3.2 ASSUMPTIONS

The consultant assumed that a newly developed community campsite would consist of, on average, 12 sites per camping ground with each site being able to accommodate a maximum of 6 patrons. Projected campsite occupancy, at 30%, is significantly higher than that currently being achieved at most of the community campsites. This is based on the assumption that a demand assessment would be undertaken prior to the development of a campsite and that the site would be marketed to domestic, regional and international tourists.

A site double occupancy of 200% has been assumed i.e. on average each site occupied will accommodate 3 patrons. Rates of N$25 per person per night have been assumed - similar to the rates currently charged. It has been assumed that this rate includes sales tax and that no discounts would be offered to tour operators, travel agents, etc. Given these assumptions the average achieved rate is approximately N$23 per camper per night.

12.3.3 REVENUE PROJECTIONS

The projected revenue accruing to the community campsite from overnight campers is detailed on page 1 of Annexure A.

Based on the assumptions discussed in Section 12.3.2 a community campsite could accrue approximately N$100 000 in revenue in 1999 terms. In 2005 terms this revenue would be in the region of N$150 000.

12.3.4 EMPLOYMENT

It has been assumed that a community campsite would create approximately 0.25 jobs per campsite or 3 jobs for 12 campsites.

Of these employees, it is assumed that 95% would be semi-skilled or unskilled occupations and 5% mid-level occupations. Thus the total estimated salaries paid to these employees would be approximately N$16 500 per annum in 1999 terms. This calculation is based on typical salaries currently paid to unskilled and semi-skilled community campsite employees in the region.
12.3.5 TAXATION

The following has been assumed in terms of taxation:

- General Sales Tax: 10%
- Average corporate tax rate: 35%
- Average percentage turnover equal to taxable corporate profits: 10%
- Average personal tax rate:
  - High-level occupations: 35%
  - Mid-level occupations: 15%
  - Semi-skilled and unskilled occupations: 10%

Based on these assumptions, in 1999 terms, a community campsite would contribute approximately N$14 000 annually, in the form of General Sales Tax, corporate taxes and personal taxes, to the Namibian fiscus (refer to page 2, Annexure A).

12.3.6 ESTIMATED DIRECT REVENUE ACCRUING TO THE COMMUNITY

It is believed that a community campsite would source all of its employees from the local community and thus the annual N$16 500 paid in the form of salaries/wages would accrue within the community.

It has been assumed that the community would wholly own the campsite and thus all profits would accrue to the community. Profits are estimated at 10% of turnover i.e. N$10 000 in 1999 terms.

Thus, the direct contribution to a community from a campsite would be in the region of N$26 000 (1999).

12.3.7 ESTIMATED TOTAL DIRECT AND INDIRECT CONTRIBUTION TO REGIONAL GDP AND EMPLOYMENT

Income Multipliers:

Operations:

Selecting the appropriate multiplier is problematical, because limited empirical research data is available in Namibia on projects of this nature.

The size of the multiplier varies according to the area's level of economic development. Given that the North West Region of Namibia is a small economy, relatively high leakage will takes place in its economy.
However, given the predicted high reliance of community campsites on local resources we have assumed that spend within a campsite will experience a leakage from the regional economy of 70%, resulting in a regional income multiplier of 1.25.

Construction:

Given the estimated demand for construction related resources that are not readily available within the region we have estimated that leakage of 90% will take place in the regional economy, and have therefore applied a regional income multiplier (construction) of 1.0.

Employment Multipliers:

Operations:

According to the Ministry of Environment and Tourism, approximately 1 to 1.5 indirect jobs are created for each direct job in a tourism establishment. We have assumed a job multiplier of 1.5 indirect jobs per direct job created during operations.

Contribution to regional GDP during construction:

It has been assumed that the capital expenditure required to develop a community campsite in the study area would be approximately N$200 000. The implications of this development cost indicate that approximately N$200 000 would accrue to the regional economy in the form of direct and indirect construction expenditure.

Contribution to regional GDP and employment during operations:

The estimated direct expenditure that may accrue to a community campsite in the study area during ongoing operations could directly and indirectly create 7.5 permanent jobs in the local community and generate direct and indirect expenditure of N$120 000 in the regional economy in 1999.
12.4 MID-MARKET LODGE

12.4.1 BACKGROUND

A mid-market lodge has been assumed to be a tourism plant establishment that is either tented or made of reed, brick and mortar, wood or other materials, and provides accommodation and catering facilities for mid-market tourists. This type of establishment has been called a "lodge" purely for convenience and uniformity in terminology.

It has been assumed that any new mid-market lodge development in the study area will have community participation or involvement as either landlords and/or equity partners and through employment opportunities.

Current demand for mid-market facilities in the study area appears to be quite high and, in the lack of accurate statistics, our perceptions indicate that currently demand exceeds supply in this market.

Our economic impact assessment of a mid-market lodge is detailed in Annexure A, pages 4 to 6.

12.4.2 ASSUMPTIONS

It has been assumed that an average mid-market accommodation facility (lodge) located in the study area will consist of 20 rooms and be able to accommodate a total of 40 overnight guests.

Average room occupancy has been assumed at 55% and double occupancy at 85%. A dinner, bed and breakfast rack rate of N$355 per person per night has been assumed. Taking General Sales Tax and average discounts applied to tour operators, travel agents, etc the average rate per person per night is estimated at N$258.

12.4.3 REVENUE PROJECTIONS

The projected revenue accruing to a mid-market accommodation establishment, based on the above-mentioned assumptions, is detailed in Annexure A, page 4.

In 1999 terms, the total revenue that could accrue to a mid-market lodge would be approximately N$2.6 million per annum and in 2005 approximately N$4 million.
12.4.4 EMPLOYMENT

It has been assumed that a mid-market accommodation facility will create employment for approximately 1 person per room of which 2% will be high-level occupations, 18% mid-level and 80% semi- and unskilled occupations.

The total estimated annual salaries paid to these employees, in 1999 terms, would be approximately N$180 000.

12.4.5 TAXATION

In 1999 a mid-market lodge has been estimated to contribute approximately N$280 000 to the Namibian fiscus in terms of General Sales Tax, personal taxes and corporate taxes.

The taxation assumptions applied are equivalent to those discussed in Section 12.3.5 (refer to page 5 of Annexure A).

12.4.6 ESTIMATED DIRECT REVENUE ACCRUING TO THE COMMUNITY

A mid-market lodge or accommodation establishment located in the study area is believed to source approximately 90% of its employees from the local community. Given this assumption approximately, N$160 000 would accrue annually to the community in the form of salaries and wages.

It has been assumed that the community would not wholly own the lodge but rather that the community would be a 25% equity partner in the development and that the lodge would lease land from the community at 10% of annual turnover. Based on these assumptions the annual rental (1999) and corporate profits that should accrue to the community would be approximately N$210 000 and N$50 000 respectively.

12.4.7 ESTIMATED TOTAL DIRECT AND INDIRECT CONTRIBUTION TO REGIONAL GDP AND EMPLOYMENT

Income Multipliers:

It has been assumed that a mid-market lodge would have a higher operational leakage from the regional economy than a community campsite. This leakage has been assumed to be 80% of the direct expenditure, which results in a regional income multiplier of 1.11.
The income multiplier to be applied during construction is equivalent to that applied for the development of a community campsite.

**Employment Multiplier:**
The employment multiplier to be applied during operations is equivalent to that applied for the development of a community campsite.

**Contribution to regional GDP during construction:**

With a capital expenditure of N$1.5 million net income to the regional GDP would be approximately N$1.5 million during the construction phase of a mid-market lodge.

**Contribution to regional GDP and employment during operations:**

The estimated direct spend at a mid-market lodge would generate approximately N$2.9 million in direct and indirect spend in the regional economy and approximately 50 permanent jobs would be created.

### 2.5 UPMARKET LODGE

#### 12.5.1 BACKGROUND

An upmarket lodge can be described as an accommodation establishment made of reed, bricks, wood, or other materials and charges an all-inclusive rack rate of R600 or more person per night sharing – catering largely towards upmarket overseas and regional tourists. Once again this type of establishment has been termed a “lodge” purely for convenience and uniformity in terminology.

As with a mid-market accommodation establishment we have assumed that the local community would have an equity participation in the upmarket facility, may be the landlord of the land on which the lodge is located and would be provided with employment opportunities at the establishment.

The economic impact assessment of an upmarket lodge is detailed in Annexure A. pages 7 to 9.
12.5.2 ASSUMPTIONS

It has been assumed that an average upmarket lodge would comprise of 12 rooms and 24 beds and that the average room occupancy would be 50% and double occupancy 85%.

An average all-inclusive rack rate of N$800 per person per night has been assumed with average discounts of 25%. Based on these assumptions and incorporating General Sales Tax, it is estimated that an average upmarket lodge would achieve an average rate of N$582 per person.

12.5.3 REVENUE PROJECTIONS

The projected revenue that could accrue to an upmarket lodge in the study area, based on the above-mentioned assumptions, is detailed in Annexure A, page 7.

In 1999 terms, it is estimated that the total revenue that would accrue to an upmarket lodge would be approximately N$3.2 million increasing to N$4.9 million in 2005.

12.5.4 EMPLOYMENT

It has been estimated that an upmarket lodge located in the study area would create employment for approximately 1.8 people per room. Of the employment created 2% would be high-level occupations, 23% mid-level and 75% semi- and unskilled occupations.

The total estimated annual salaries paid to these employees is estimated to be approximately N$175 000 in 1999 terms.

12.5.5 TAXATION

In 1999 terms, it is estimated that an upmarket lodge would contribute approximately N$340 000 to the Namibian fiscus in respect of corporate, personal and General Sales taxes.

12.5.6 ESTIMATED DIRECT REVENUE ACCRUING TO THE COMMUNITY

As with a mid-market lodge, it is believed that approximately 90% of the employees would be from the local community. Thus approximately N$160 000 would accrue directly to the community in the form of wages and salaries.
Assuming that the community is a 25% equity holder in the development and that the land on which the development is located is leased from the community at 10% of annual turnover, it is estimated that the community would receive an additional income of N$325,000 per annum from these two sources.

12.5.7 ESTIMATED TOTAL DIRECT AND INDIRECT CONTRIBUTION TO REGIONAL GDP AND EMPLOYMENT

Multipliers:

The income and employment multipliers utilised for both construction and operations are equivalent to those applied for the mid-market lodge.

Contribution to regional GDP during construction:

It is estimated that, on average, an upmarket lodge would require capital expenditure of N$2,5 million to develop. The implications of such capital expenditure on the regional economy would be N$2,5 million.

Contribution to regional GDP and employment during operations:

It is estimated that the direct expenditure at an upmarket lodge in the study area would generate approximately N$3,6 million in the regional economy in 1999 terms and will create approximately 48 permanent jobs.

12.6 COMPARATIVE EVALUATION

12.6.1 INTRODUCTION

The impact of the three different types of accommodation facilities has been compared and is discussed hereunder. The impact of the facilities have been compared according to:

- Direct contribution to local salaries and wages;
- Total contribution to local community;
- Direct taxation contribution;
- Total direct and indirect employment created;
- Total direct and indirect income generated in the regional economy; and
- Estimated total development cost.
12.6.2 DIRECT CONTRIBUTION TO SALARIES AND WAGES

Graph 12.1 depicts the direct contribution that each of the three facilities could make to the local community in the form of salaries and wages. Mid- and upmarket lodges could contribute 10 times the amount of income to the community in the form of salaries and wages than a community campsite.

![Graph 12.1: Direct Community Salary/Wage Contribution](image)

12.6.3 TOTAL CONTRIBUTION TO COMMUNITIES

Graph 12.2 depicts the total contribution that could accrue to the community from each type of facility in the form of salaries/wages, corporate profits and/or rental. The results indicate that mid- and upmarket lodges could contribute 17 times that of a community campsite.

![Graph 12.2: Total Direct Community Benefits](image)
12.6.4 DIRECT TAXATION CONTRIBUTION

Graph 12.3: Total Taxation Contribution

Mid- and upmarket lodges could contribute up to 19 times that of a community campsite to the Namibian national fiscus in the form of corporate, personal and general sales taxes. This is graphically displayed in Graph 12.3.

12.6.5 CONTRIBUTION TO EMPLOYMENT DURING OPERATIONS

Graph 12.4: Direct and Indirect Contribution to Employment

Graph 12.4 depicts the total direct and indirect employment opportunities created by the three development options during operations.

An upmarket and mid-market lodge could create 6 times the number of jobs created by a community campsite.
12.6.6 CONTRIBUTION TO REGIONAL GDP

Graph 12.5 depicts the overall contribution that each type of facility makes to the regional economy in terms of direct and indirect expenditure.

Compared to an upmarket or mid-market lodge facility, a community campsite contributes an insignificant amount to the regional economy.

Graph 12.5: Direct and Indirect Contribution to Regional GDP

12.6.7 DEVELOPMENT COST

Graph 12.6 depicts the estimated total development cost for the three proposed development options. The development costs of a community campsite are approximately 10 times less than that of a mid-/upmarket lodge.

Graph 12.6: Estimated Development Costs
12.7 CONCLUSION

The hypothetical economic assessment comparing the economic returns of a community campsite, mid-market lodge and upmarket lodge clearly indicate that mid- or upmarket lodges provide significantly greater economic returns to the community and regional economy than a community campsite.

Mid- and upmarket lodges, although providing greater economic benefit to the region clearly require a far greater capital outlay for development and hence carry a greater risk on potential return on investment. The opposite is true for a community campsite.

It is important to bear in mind that a community campsite should not be discarded as a development option. A well-market and managed campsite could also provide economic returns to the community, although less than that of a mid- or upmarket lodge. Visitor demand may necessitate that a campsite would be more desirable in a particular area than say a mid- or upmarket lodge and hence the returns provided by a campsite are clearly better than no development at all or uncontrolled camping.
13. COST/BENEFIT ASSESSMENT

13.1 INTRODUCTION

Tourism has definite and often measurable impacts on the environment and socio-cultural aspects of a region. These impacts are more significant when one considers that much of tourism's appeal relies on the quality of the environment itself.

The cost/benefit assessments tabled below have been developed to aid local planners in respect of tourism development within the region. These assessments indicate more than just that income and employment may be created but also how tourism benefits may be distributed and what economic, social and environmental impact costs may result from the development process and ultimately whether the benefits outweigh the costs.

A cost/benefit assessment, although an important activity to perform, is difficult to carry out since a number of the costs and benefits are difficult to quantify. In many cases the assessment has thus remained qualitative as opposed to quantitative. The quantitative cost/benefit assessment has essentially been carried out in Chapter 11 of this report.

During the assessment a cost/benefit assessment was conducted for:

- Planned tourism development in the region – Table 13.1;
- Unplanned tourism development in the region – Table 13.2;
- The development of a community campsite (as described in Section 12.2.1) – Table 13.3; and
- The development of a mid- or upmarket lodge (as described in Sections 12.3.1 and 12.4.1 respectively) – Table 13.4.

It is important to note that the qualitative aspects of the cost/benefit assessment are subjective and based on perceptions and our knowledge of the tourism industry.

Parties have been identified who benefit from, and those that pay the costs of the type of tourism development proposed.

13.2 PLANNED VS UNPLANNED TOURISM DEVELOPMENT

The comparative cost/benefit assessment between planned and unplanned tourism development within the study area clearly indicates that the benefits of planned development outweigh those of unplanned developments (refer to Tables 13.1 and 13.2).

Unplanned tourism development could lead to:
• Investors developing at will without community participation;
• Communities developing at will without tourism expertise; and
• Visitors travelling and camping at will within the region.

The implications of such development are that tourism demand for the region may be high in the short-term and thus may provide significant short-term economic benefits for the local population and government. However, these short-term benefits will have negative implications in respect of long-term sustainability of the natural environment, social or cultural aspects of the region and economic spin-offs to the local population, local and national government.

Planned development, although limiting short-term gains from tourism development in the region, should, if properly planned and managed, ensure that the tourism industry in the region is sustainable in the longer term and that the key resources on which the industry is based i.e. the sensitive environment and culture, are conserved.

In order to maximise the economic spin-offs of tourism developments for the local population and local government, it is recommended that leakages from the regional economy be minimised as far as possible. Leakages from the region are anticipated to be relatively high. Salaries and wages, local services, the revenue generated from the sale of local arts and handicrafts, etc will largely remain within the regional economy. However, spends on imported goods such as fuel, foodstuffs, commodities and services will necessitate that a lot of the income generated in the region will be spent in other regional economies. It is suggested, in order to maintain as much of the spend in the regional economy as possible and hence maximise the regional tourism spin-offs, that community members be encouraged to develop industries which support the local tourism industry i.e. by supplying fresh fruit and vegetables to tourists and tourism facilities, providing laundry or other outsourcing services, etc, and in this way increasing the rounds of expenditure within the region and improving the tourism industry's contribution to the regional economy. However, it is important that these support industries be developed and operated competitively in order to benefit the industry and regional economy.

The seasonality of tourism demand and the dependence of the region on tourism indicate that local communities and the regional economy will be particularly susceptible to fluctuations in tourism demand. In this regard, it is recommended that a concerted marketing effort be formulated, driven by national and regional government to ensure that the implications of seasonal and sporadic demand fluctuations, are as far as possible, mitigated against. Suggestions in respect of regional marketing are discussed in chapter 14.
Increased tourism demand for the area, via planned or unplanned tourism development, will imply that increasing numbers of tourists will be visiting the region. These tourists need to be educated and informed about the region's environmental and social fragility. Educating tourists on how to behave and act in order to ensure long-term sustainability is, we believe, one of the most critical issues emanating from our research. Currently, tourists visiting the area are, in general, naïve about the environmental and social susceptibility of the region. Visitor education may be achieved through a visitor code-of-conduct displayed on signboards located in key areas within the study area and/or through brochures disseminated to all visitors to the region and displayed at all accommodation/campsite establishments.
### Table 13.1: Cost/Benefit Assessment – Planned Tourism Development

<table>
<thead>
<tr>
<th>Nature</th>
<th>Description</th>
<th>Borne By</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BENEFITS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Economic</td>
<td>Sustainable long-term income generation opportunities</td>
<td>Local Population, Investors</td>
</tr>
<tr>
<td>2. Economic</td>
<td>Sustainable long-term employment opportunities</td>
<td>Local Population, Investors</td>
</tr>
<tr>
<td>3. Economic</td>
<td>Stimulates local craft and other industries</td>
<td>Local Population</td>
</tr>
<tr>
<td>4. Economic</td>
<td>Diversifies economy – away from only agriculture</td>
<td>Local Population, Government</td>
</tr>
<tr>
<td>5. Economic</td>
<td>Injects capital into the regional economy via tourism plant development</td>
<td>Local Population, Government</td>
</tr>
<tr>
<td>7. Economic</td>
<td>Increased revenue to market the area thus encouraging a continued and sustainable tourism industry</td>
<td>Local Population, Government</td>
</tr>
<tr>
<td>8. Environmental/Economic</td>
<td>Encourages the productive use of land which has no or limited economic value</td>
<td>Local Population, Government</td>
</tr>
<tr>
<td>9. Environmental/Economic</td>
<td>Could finance some or all aspects of conservation</td>
<td>Local Population, Government</td>
</tr>
<tr>
<td>10. Environmental/Economic</td>
<td>Promotes conservation interest in the area and could stimulate Government or others to invest in conservation</td>
<td>Local Population, Government</td>
</tr>
<tr>
<td>11. Environmental</td>
<td>Sensitive environments and wildlife are protected from irresponsible behaviour</td>
<td>Local Population, Government</td>
</tr>
<tr>
<td>12. Social</td>
<td>Maintenance of the &quot;sense of place&quot;</td>
<td>Local Population, Toursists</td>
</tr>
<tr>
<td>13. Social</td>
<td>Increases cultural interaction and hence understanding</td>
<td>Local Population, Toursists</td>
</tr>
<tr>
<td>14. Social</td>
<td>Increases global interaction and educational gains</td>
<td>Local Population, Investors</td>
</tr>
<tr>
<td>15. Social</td>
<td>The local community has the best knowledge and will to make the best guides/rangers, etc</td>
<td>Local Population, Toursists</td>
</tr>
</tbody>
</table>

### Table 13.1: Cost/Benefit Assessment – Planned Tourism Development Cont.

<table>
<thead>
<tr>
<th>Nature</th>
<th>Description</th>
<th>Borne By</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>COSTS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Economic</td>
<td>Short-term employment and income generation opportunities are limited</td>
<td>Local Population, Government</td>
</tr>
<tr>
<td>2. Economic</td>
<td>Leakage of revenues and dependence on imported goods and services</td>
<td>Local Population</td>
</tr>
<tr>
<td>3. Economic</td>
<td>Dependence on tourism as the prime economic activity</td>
<td>Local Population, Government</td>
</tr>
<tr>
<td>4. Social</td>
<td>Current visitors to the region may be disappointed in that restrictions would be imposed on where they can travel and camp</td>
<td>Current Tourists to the Region</td>
</tr>
</tbody>
</table>
5. Social  Increased community dissatisfaction at not being able to develop at will
6. Social  Increased erosion of culture
7. Social  Local population lacks the experience or expertise to manage/develop tourism plant
8. Social  Tourism employment will probably be seasonal
9. Social  Increased cost of living for residents
10. Social  High training costs for the local population

Local Population, Investors
Local Population, Tourists
Local Population, Investors
Local Population, Investors
Local Population
Investors
<table>
<thead>
<tr>
<th><strong>Table 13.2: Cost/Benefit Assessment – Unplanned Tourism Development</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BENEFITS</strong></td>
</tr>
<tr>
<td><strong>Nature</strong></td>
</tr>
<tr>
<td>Social</td>
</tr>
<tr>
<td>Social</td>
</tr>
<tr>
<td><strong>COSTS</strong></td>
</tr>
<tr>
<td>Economic</td>
</tr>
<tr>
<td>Economic</td>
</tr>
<tr>
<td>Economic/Environmental</td>
</tr>
<tr>
<td>Environmental</td>
</tr>
<tr>
<td>Environmental</td>
</tr>
<tr>
<td>Environmental</td>
</tr>
<tr>
<td>Social</td>
</tr>
<tr>
<td>Social</td>
</tr>
<tr>
<td>Social</td>
</tr>
</tbody>
</table>
13.3 COMMUNITY CAMPSITE VS MID-/UPMARKET LODGE DEVELOPMENT

13.3.1 INTRODUCTION

Tables 13.3 and 13.4, detailing the cost/benefit assessment for a community campsite and mid-/upmarket lodge respectively, indicate that a mid-/upmarket lodge is significantly far more beneficial economically to operate within the region. However, it is believed that the merits of a community campsite should not to be forgotten. A community campsite certainly does offer benefits to the local population, however, these benefits are particularly small in magnitude when compared to those that may be achieved from a mid-/upmarket tourism establishment.

13.3.2 COMMUNITY CAMPSITE

A community campsite offers the local population the benefit of not having to raise large sums of capital to develop a tourism establishment and thus the development is significantly lower than that of a lodge, however, the resulting economic benefits to the community are limited (approximately 17 times less than that achievable via a lodge development).

Community campsites do not necessarily require significant skills development and therefore affords the local population the opportunity of owning the facility in its entirety.

Campsites clearly offer the budget or more adventurous domestic, regional or international tourist the opportunity to visit and experience the area without having to pay significantly higher rates for catered accommodation. The lower rates could allow these visitors to increase their length of stay in the region thus potentially distributing spend, although low, throughout the region.

Due to the limited infrastructure requirements to develop a community campsite, the negative impact on the environment during construction should be relatively insignificant and certainly much lower than that of a lodge development.

On the negative side, community campsites, in general, attract low spend tourists who do not spend much in the region and tend to bring a lot of their supplies with them on their visit. However, these visitors are, in essence, a captive market for entrepreneurs wishing to establish commodity supply store/s catering for the daily needs of campers. Clearly this opportunity could increase
direct and indirect revenues in the region as a direct result of visitors staying at
a community campsite.

The low revenues accumulated by a community campsite from overnight
campers limits the opportunity of campsite management to market their
establishment or contribute towards regional marketing initiatives. In addition
the local employment opportunities are very low (estimated at 8 permanent
direct and indirect jobs per 12 campsites) and hence the wages/salaries that
may accrue to the community are also low and the impact that the campsite has
on local unemployment levels will be minimal.

Community campsites contribute very little to the Namibian fiscus. The
consequence of this being limited local and national taxes available for the
development or improvement of local infrastructure and other services.

Training of staff to manage and market a community campsite has been limited.
The low estimated revenues indicate that staff training opportunities will
continue to be limited unless non-governmental organisations are able to
provide financial or other assistance in this regard. We believe that it is unlikely
that the private sector would be willing to assist financially or otherwise in the
development or management of a community campsite. Thus without support,
the development and training of personnel associated with a community
campsite is likely to be marginal.

A community camp with 12 campsites could accommodate, at peak capacity,
72 overnight guests. This is significantly higher than the number of guests that
can be accommodated at an average lodge. During periods of peak demand
these campers may pressurise the environment and the region's scarce
resources.

13.3.3 MID-/UPMARKET LODGE

Mid- and upmarket lodges could potentially generate significant direct and
indirect local employment opportunities; stimulate the local economy by means
of increased direct and indirect expenditure in the region; and contribute
towards the local and national fiscus. Thus a lodge could uplift the regional
economy and hence encourage further development in the region.

Due to the lack of tourism expertise currently available from within the local
community, lodge management would need to be imported into the region.
However, it is recommended that all new developments should contain a sunset
clause which ensures that within a given timeframe all employees should be trained by management and that eventually all staff would be employed from the region. In general, hospitality and other training of lodge employees, provided by the private sector, should help to educate the community in respect of the tourism industry.

Private sector lodge management and/or ownership should contribute significant resources and expertise in terms of lodge and regional marketing initiatives. Contacts, established marketing networks/channels as well as client databases could create an immediate market for a lodge.

In order for a lodge to be commercially viable it is recommended that, at least in the short-term, the private sector be involved either as owners and/or management. Thus the opportunity for the community to wholly own or reap the entire benefits of any lodge developed in the region is limited. It also implies that a percentage of the profits would leak from the region in the case of the private sector not being regionally based.

Lodge developments have a greater need for consumables and other resources than a community campsite. These resources could be sourced from the region thus encouraging the development of commercially viable small, medium and micro enterprises ("SMMEs"). To encourage entrepreneurial activities, it is recommended that as far as possible non-core lodge activities should be outsourced to enterprises formed by members of the regional population. Examples of non-core activities area:

- Laundry;
- Maintenance;
- Landscaping/garden maintenance;
- Supply of foodstuffs/commodities;
- Security; etc

It is possible that during lodge construction environmental degradation could be significant. In addition, if not properly managed, the overall design of a lodge and its associated infrastructure could be environmentally and aesthetically displeasing. Thus it is important that strict development guidelines be implemented for lodges.

However, due to the relatively small size of a lodge, the number of people visiting an environmentally sensitive area can be controlled and monitored. Lodges also allow for easier guest interaction than a community campsite. In
this way guest behaviour can be monitored and guests can be educated about appropriate behaviour or conduct.
### Table 13.3: Cost/Benefit Assessment – Community Campsite

<table>
<thead>
<tr>
<th>Nature</th>
<th>Description</th>
<th>Borne By</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Economic</td>
<td>Local Population</td>
</tr>
<tr>
<td>2.</td>
<td>Environmental</td>
<td>Local Population, Environment,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tourists</td>
</tr>
<tr>
<td>3.</td>
<td>Social</td>
<td>Local Population</td>
</tr>
<tr>
<td>4.</td>
<td>Social</td>
<td>Local Population</td>
</tr>
<tr>
<td>5.</td>
<td>Social</td>
<td>Tourists</td>
</tr>
</tbody>
</table>

**BENEFITS**

1. Economic | Limited capital required to develop a community campsite
2. Environmental | Limited negative impact on the environment during the development of a community campsite
3. Social | Ownership of a tourism facility
4. Social | Limited skills required to develop a community campsite
5. Social | Caters for local, regional and international budget travellers to the region

**COSTS**

1. Economic | Limited additional economic activity in the area
2. Economic | Limited salaries/wages accrued to the local population
3. Economic | Attracts, in general, low spend travellers who spend limited amounts of money in the region
4. Economic | Limited funds generated to market the campsite or the destination
5. Economic/Social | Limited taxation benefits – limited improvements to local infrastructure, health and social services, etc
6. Environmental | Could accommodate large number of visitors thus pressuring the environment and scarce resources
7. Social | Low number of jobs created thus limiting the impact on unemployment levels
8. Social | Limited potential for skills development
9. Social/Economic | Limited additional opportunities for entrepreneurial activity, training, personal development, etc
10. Social/Economic | Lack of skills available within the local population to manage a tourism plant facility

Local Population
Local Population, Environment, Tourists
Local Population
Local Population
Tourists
Local Population
Local Population
National Government, Local Government, Local Population, Environment
Local Population
Local Population
Local Population, Local Government
Local Population
Local Population, Local Government
Local Population
### Table 13.4: Cost/Benefit Assessment – Mid- and Upmarket Lodge

#### BENEFITS

<table>
<thead>
<tr>
<th>Nature</th>
<th>Description</th>
<th>Borne By</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Economic</td>
<td>Creates employment opportunities in the region</td>
<td>Local Population</td>
</tr>
<tr>
<td>2. Economic</td>
<td>Generates income and expenditure in the region</td>
<td>Local Population, Local Government</td>
</tr>
<tr>
<td>3. Economic</td>
<td>Creates entrepreneurial opportunities</td>
<td>Local Population</td>
</tr>
<tr>
<td>4. Economic</td>
<td>Private sector management/ownership could maximise marketing opportunities</td>
<td>Local Population, Investors</td>
</tr>
<tr>
<td>5. Economic</td>
<td>Currently it is perceived that demand for mid-market tourism establishments exceeds supply</td>
<td>National Government, Local Government</td>
</tr>
<tr>
<td>6. Economic</td>
<td>Generates corporate, personal and general sales taxes</td>
<td>Local Government</td>
</tr>
<tr>
<td>7. Economic/Social</td>
<td>Generates skill transfer and training/learning opportunities</td>
<td>Local Population</td>
</tr>
<tr>
<td>8. Environmental</td>
<td>High rack rates can limit the number of visitors that enter an environmentally sensitive area</td>
<td>Environment</td>
</tr>
</tbody>
</table>

#### COSTS

<table>
<thead>
<tr>
<th>Nature</th>
<th>Description</th>
<th>Borne By</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Economic/Social</td>
<td>Not wholly owned/controlled by the community</td>
<td>Local Population</td>
</tr>
<tr>
<td>2. Social</td>
<td>Local population lack expertise to manage such tourism establishments therefore would require support from experts in the field</td>
<td>Local Population</td>
</tr>
<tr>
<td>3. Economic</td>
<td>High prices could limit tourist stay in the region</td>
<td>Local Population, Local Government, Tourists</td>
</tr>
<tr>
<td>4. Social</td>
<td>Limits opportunities for low spend tourists to partake in higher priced activities/facilities</td>
<td>Environment</td>
</tr>
<tr>
<td>5. Environmental</td>
<td>Potential high environmental damage during construction</td>
<td>Environment</td>
</tr>
</tbody>
</table>
13.4 CONCLUSION

Planned tourism development in the region has obvious merits over unplanned tourism development. The costs of unplanned development are extremely high and it is thus recommended that unplanned tourism development not be considered as an option for the North West Region of Namibia.

In terms of different types of tourism plant development the results of the cost/benefit assessments are not as clear-cut. Although mid-/upmarket tourism developments clearly have greater economic and other beneficial impacts on the local population and local and national government than a community campsite, it does not necessitate that the concept of community campsites be outlawed. Community campsites do have merit particularly in instances where demand for such facilities exceeds supply or where large-scale investors cannot be sourced for a particular region. Economic and other benefits from a community campsite, even if they are relatively small, are better than no benefit at all.
14. INITIAL MARKETING STRATEGY

14.1 BACKGROUND

Before any specific marketing activities are undertaken it is important that a detailed marketing plan be developed for the North West region of Namibia. With increasing competition in the tourism industry, as more destinations are developed, we believe that destinations with a detailed operational marketing plan will outperform those without.

However, before an operational marketing plan can be developed a long-term strategic marketing plan addressing the overall mission, objectives and goals needs to be formulated. This section addresses the preliminary marketing strategy formulated for the North West regions of Namibia. The aim of this initial marketing strategy is to:

- provide a strategic framework from which a detailed short-term operational marketing plan can be developed;
- act as a guide for national and local government, communities in the region, the private sector and other parties involved to market the region; and
- support the concept of sustainable tourism development in the region.

This is a preliminary and broad marketing strategy that tries not to be prescriptive. A detailed marketing plan resulting in an action plan for the region should be the responsibility of the association/body identified to market the region. This strategy is a base from which future discussions can be directed. We believe that stakeholders such as the affected communities, national and local government, non-governmental organisations and the private sector should be consulted before detailed marketing and action plans are formulated for the region. In addition, any marketing initiatives should be in-line with those formulated for the country as a whole.

14.2 TOURISM MARKETING STRUCTURE

14.2.1 BACKGROUND

Tourism marketing is usually addressed at three or more levels within a country based on an average tourist’s decision-making process. These levels are diagrammatically represented in Figure 14.1 below.

In general, a tourist first makes the decision to visit a country, then decides which region/s they will incorporate during the trip and finally makes a decision about
which tourism products they will incorporate during their visit to the region. Thus it is clear that without national tourism marketing it is extremely difficult for a region and/or product owner to persuade tourists to visit their area as opposed to say another country.

Once a tourist has decided to visit a country they then decide which tourist regions/attractions they wish to incorporate in their trip. Thus it is important for tourism product owners located in a region with common tourist feature/s to join together to create a unified destination. In the case of the area under study, due to the range of cultural, environmental and scenic attractions the region should be viewed as a single tourist destination.

Figure 14.1: Tourism Marketing Structures

National marketing, which is usually the responsibility of the National tourism ministry or alternatively a board appointed by the ministry, incorporates the marketing of the country, globally as a tourism destination. In Namibia this responsibility currently lies with the MET. However, the “Draft Tourism Policy for Namibia” dated January 1999 recommends that a Namibia Tourism Board (“NTB”) be created by an Act of Parliament. It is proposed that the NTB have representation from both the private and public sectors and one of its main
functions would be to market the Namibian tourism product worldwide. It has been proposed that funding of the board is to be secured through:

- Continuing contributions and support from the National Budget;
- Revenue raised from the industry as prescribed by legislation; and
- Income generated through the activities of the Board.

The "Draft Tourism Policy" also states that "Namibia needs to raise the level of its marketing expenditure, particularly in its key markets of Europe and in certain developing markets throughout the world". The proposed mission of the NTB is to:

"market Namibia successfully as an attractive tourism destination to foreign source markets. The growth target in the next five years will be to increase tourism arrivals by an average rate of 12% per annum for overseas tourist arrivals and 8% for regional arrivals."

Without national marketing efforts it is extremely difficult for regions and tourism product owners to create awareness about their destination and/or product.

14.2.2 REGIONAL MARKETING

Currently in Namibia most of the regional marketing initiatives are private sector driven and managed. An example of this is "Namib i" currently operating within the study area. In general local tourism plant operators unite some of their marketing budget in an attempt to market the region in which their product is located.

Another way of marketing a region is via a publicity association or tourism information office. The responsibility of this office is to market the region and have information available for tourists and other interested parties. In general the funding of such a facility is partly via government contributions and partly via local operator contributions. There is currently no such facility operating within the study area.

14.2.3 PROPOSED MARKETING STRUCTURE

We believe that marketing of the region should be the responsibility of a marketing entity guided by a forum or committee specially constituted to handle the marketing aspect. This should have representation from, inter alia:

- The public sector;
• The private sector;
• Conservancies; and
• The local population.

The marketing entity should consist of one or two full-time marketing professionals whose responsibility it would be to carry out the marketing strategy and action plans formulated. Ideally the marketing entity should be located at a key access points to the region and should distribute marketing collateral to tourists and other interested parties.

It is further believed that the detailed formulation of marketing action plans, although the responsibility of the marketing entity and its guiding committee, should be handled by a marketing expert or consultant. The region's reliance on sustainable tourism development necessitates that a comprehensive and usable marketing plan be developed and that the area attracts the identified target markets.

14.2.4 FUNDING

It is believed that the funding of the region's marketing entity and initiatives should be a joint responsibility between the public and private sector. The MET has identified that sustainable tourism development is a priority for the region in order to uplift the local communities. Thus we believe that they have an overriding responsibility to market the region.

However, this responsibility does not lie only with the national government. Marketing of the area will clearly benefit tourism operators in the region and hence they should also contribute a portion of their annual marketing budget to the regional budget. The percentage of turnover or other means identified to raise marketing funds from the private sector, be it voluntary or mandatory, is an issue to be negotiated between the public and private sector.

14.3 GUIDING PRINCIPLES

In order to ensure that the final operational marketing plan is user friendly and successful in achieving its objectives, it is recommended that the following guiding principles be followed and continually strived for:

• the marketing plan, including any and all promotion policy decisions, should be formulated with input from all parties involved, i.e. the public sector, private
enterprises and the local population, so that all parties accept the plan and agree with any implementation strategies;

- ensure that any and all marketing efforts of the public and private sector are co-ordinated and complementary so that the market sees a unified and consistent impression of the area;
- keep the whole region in mind when developing the policy so that the whole area may benefit and so that partnership and co-ordinated marketing initiatives are made possible;
- ensure that the region and the affected communities are aware of the consequences of the marketing plan and are able to handle demand should marketing initiatives be successful;
- establish limits of promotion according to, among others, visitor carrying capacities, in order to ensure the quality of any visitor experience in the area;
- marketing should target all potential visitors to the area; foreign, regional and domestic;
- measure and assess the results of the marketing and promotion strategy and incorporate any finding into future decision making; and
- ensure that any body marketing the area is made aware of and distributes current information regarding:
  - the extent of existing resources and facilities in the area;
  - the codes of conduct to be followed by the tourism industry; and
  - the codes of conduct to be followed by visitors.

14.4 OBJECTIVES OF THE MARKETING PLAN

The overriding objectives of the marketing plan for the region should be to:

- create an awareness of the area;
- create a desire to visit and experience the area;
- increase the number of tourists visiting the area;
- increase the average length of stay in the region;
- increase the average spend per tourist;
- attract the identified target markets; and
- ensure that visitors are aware of the environmental and cultural sensitivity of the area.

A controlled increase in visitor numbers will assist in the upliftment of the affected community as a result of tourist spend in the area, and can contribute resources to ongoing conservation and management of the area. However, it is important to ensure that accurate information about the environment and environmental impacts is provided.
in marketing material in this way ensuring that visitors are matched to the experiences that are available.

14.5 SWOT ANALYSIS

A SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis has been undertaken for the region. This analysis, although not being able to foresee all possible events, identifies current conditions and expected changes, which allows for the identification of challenges that need to be met as well as the potential uniqueness of the area. The result of this analysis is detailed below in Table 14.1.

Table 14.1: SWOT Analysis

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultural richness – Himba, Herero, Damara, etc</td>
<td>Very hot summer temperatures</td>
</tr>
<tr>
<td>Wide selection and dispersion of rock paintings</td>
<td>Local population not adapted to the tourism industry</td>
</tr>
<tr>
<td>Unique wildlife – desert elephant, black rhino, etc</td>
<td>Limited tourism and other infrastructure in the region</td>
</tr>
<tr>
<td>Naturally occurring wildlife</td>
<td>High environmental sensitivity in low rainfall areas</td>
</tr>
<tr>
<td>Ephemeral rivers</td>
<td>Limited access for 2X4 vehicles</td>
</tr>
<tr>
<td>Interesting geological formations</td>
<td>The region encompasses a very large area therefore distances between destinations may be too long</td>
</tr>
<tr>
<td>Scenic landscapes, river beds, springs, etc</td>
<td>Current lack of knowledge of the area</td>
</tr>
<tr>
<td>German heritage</td>
<td>Current lack of marketing of the region</td>
</tr>
</tbody>
</table>

**OPPORTUNITIES**

- Possibility of generating wealth in the area, uplifting the community and increasing the standard of living
- Putting Namibia "on the map"
- Conserving a national asset and unique wilderness area.

**THREATS**

- Current low-key marketing of Namibia as a tourism destination
- Possible damage to the area and loss of unique assets in the area
- Increasing levels of crime against tourists.
14.6 UNIQUE SELLING POINTS AND BRANDING

During the 5 workshops held in the study area the following were identified as the region's existing and potential tourism attractions, inter alia:

- wildlife, in particular the desert elephant and black rhino;
- culture, in particular the Himba culture;
- rock engravings and paintings, in particular "Twyfelfontein";
- geological formations, in particular "Brandberg", "Spitzkoppe", "Finger Rock", "Organ Pipes", "Doros Crater", petrified forests and "Burnt Mountain";
- ephemeral rivers, in particular the Hoanib, Hoarusib, Ugab and Ombonde;
- Springs, waterfalls and rivers in particular "Warmquelle", Khowarib Schlucht, and "Ongongo Falls";
- Kunene River, in particular the Epupa Falls;
- Swakopmund and German heritage;
- locally produced crafts; and
- the overall attractive desert scenery.

The North West region has many outstanding characteristics, however, when compared to competitive Namibia and other southern African regions, the region's unique selling points ("USP") have been identified as:

- Himba cultural;
- Desert wildlife;
- Geological formations; and
- The wide range of features/attractions in the region.

Abundant wildlife can be found in many southern African destinations, however, the desert elephant and naturally occurring black rhino can only be found in the study area. In addition African cultures can be found in many regions in southern Africa, however, the Himba culture is the only local culture that is isolated to the region and is of particular interest to foreign and local tourists. Finally, geological formations and desert scenery are present in many of Namibia's tourism regions, however, the unique formations discussed above are only found in the study area.

It is important to remember that although many of the non-unique features/attractions may be found elsewhere it does not mean that they are not important to tourism development in the study area. The importance of this exercise is determining those features that cannot be found elsewhere and are thus a "unique selling point" for the region. These unique selling points are key to attracting tourists to the area because
demands for the non-unique attractions could be satisfied by visiting other regions with similar features/attractions.

It is believed that a brand, with associated brand values, should be developed for the region in consultation with stakeholders. The brand name and values should flow from the region's unique selling points and should be used on all marketing collateral produced for the region.

14.7 TARGET MARKETS

Selecting appropriate target markets is very important in the development of a marketing plan. Target markets are those market segments that will be the focus for marketing efforts through the life of the marketing plan.

Preliminary target markets for the region have been identified based on the region's current tourist profile. We have also considered the type of tourist that would be more aware and considerate of the environmental and cultural sensitivity of the region. However, these target markets may be expanded upon or adapted during the development of the marketing operational plan. These markets are as follows:

1. Overseas tourists, aged between 30 and 60 years, with a particular interest in:
   - Wildlife;
   - African cultures;
   - German heritage; and/or
   - Adventure tourism

2. High income, regional tourists who travel in small family or other groups, with a particular interest in:
   - Adventure tourism – 4X4 driving;
   - African culture; and/or
   - Nature tourism

3. High income, domestic tourists with a particular interest in:
   - Adventure tourism – 4X4 driving;
   - Local cultures; and/or
   - Nature tourism

14.8 TECHNIQUES TO ATTRACT TARGET MARKETS

Possible techniques to attract these target markets to the region have been identified and are discussed below.
These techniques should be ranked and prioritised according to the estimated monetary and time budget constraints versus the potential resulting demand for the area. Once prioritised, an accurate marketing budget and action plan for the region can be developed that is linked to regional southern African and Namibian marketing plans.

FOREIGN VISITORS:

Foreign tourists could be targeted through tour operators, both local and foreign, that deal with inbound tour groups to Namibia and travel agents, both local and foreign, that deal with travel within Namibia. This could be done with informative material, educational or familiarisation trips, presentations for invited tour operators and/or travel agents, etc.

It is believed that tour operators should be categorised according to the number of tours they conduct; average tour size; and their interest in conducting tours to the area. Relationships with those tour operators that bring significant numbers of tours to the area should be nurtured and ongoing. Smaller operators, with little or no demand for the area should only be contacted sporadically if the potential demand can justify the marketing expense.

Informative and educational material, for example an appropriate range of pamphlets, brochures, newsletters, video, slides, etc on the region should be available at key locations viz:

- all tourism information centres in Namibia;
- all tourism establishments in and surrounding the North West region;
- at South Africa’s international marketing initiative – Indaba;
- all embassies and consulates in Namibia;
- all Namibian International Airports; and
- as part of a national stand at large international marketing initiatives, e.g. ITB, WTM, etc.

Other possible ways to reach this target group include:

- maintaining an informative and quality website on the internet; and
- ensuring that all tourism providers in the region market the destination themselves with good service and by offering an appropriate product. In order to do this, staff needs training and an understanding of the region, its significance, objectives and image.
REGIONAL AND DOMESTIC VISITORS:

In general, domestic and regional tourists do not refer to tourist information bureaus when making decisions regarding their trips within southern Africa. It is, therefore, important to reach this target market through other means than those used for foreign tourists.

An awareness of, and a desire to visit, the region can be created through:

- informative magazine/newspaper articles linked to the region;
- advertisements in Getaway or equivalent print media where domestic travellers search for holiday ideas;
- an informative, educational and interesting website on the internet linked to key destinations, attractions or similar websites that have a high "hit-rate"; and
- television documentaries, inserts in television programmes, interviews with academics and others on television and radio shows, etc.

14.9 MARKETING COLLATERAL

It is recommended that marketing collateral be produced in respect of the region, viz:

- maps;
- brochures,
- pamphlets;
- website;
- videos;
- posters;
- badges; etc.

The message portrayed on these items should be synchronised for all target markets. Some of these items could be sold at various outlets to create awareness about the region.

It is recommended that the brochure produced highlight all the key attributes of the region and market the area as a whole as opposed to individual components of the region.

The website developed for the area should be linked to other websites such as:

- Key Namibian tourism sites such as national and regional marketing bodies, etc; and
- Wildlife and environmental groups, magazines, etc.
It is further recommended that the region be mentioned in marketing collateral produced by other attractions, service providers or marketing bodies. Examples include travel books such as "The Lonely Planet", "Let's Go Africa" and "Globetrotters"; visitor information books such as "Info Africa"; brochures produced by local tourism establishments; and marketing material produced by the Ministry of Environment and Tourism or the still to be formed Namibian Tourism Board.

14.10 LINKAGES TO OTHER TOURISM DESTINATIONS

It is important that the region form linkages with current or potential tourism destinations and initiatives in southern Africa. Possible destinations with which linkages could be formed are:

- Namib Naukluft;
- Caprivi;
- Etosha;
- Okavango-Delta; and
- Victoria Falls.

The advantages of forming marketing linkages are, inter alia:

- Overseas visitors do not view the study area in isolation but rather as part of a larger tourism destination i.e. their visit to the area will not be one trip but part of a trip;
- Marketing initiatives can be maximised to benefit two or more regions;
- Routes or tours operating between regions can be marketed and encouraged;
- Linkages between regions allows for the development of comprehensive visitor itineraries thus encouraging visits to the broader area and extending visitor stay; and
- Private and public sector investment may be promoted in the broader region that would benefit a greater number of people.

14.11 COMMUNITY CAMPITE

In general, community campsites in the region are not marketed and rely on passing trade and word-of-mouth to sell available camping grounds. Very often, these campsites do not have adequate signposting to guide guests to its location or even indicate the existence of the campsite.
In light of this shortfall in the marketing of community campsites, and the limited budget available for marketing, it is recommended that community campsites should, at minimum, undertake the following marketing initiatives:

- Prepare attractive brochures and make these available at all information centres and key attractions in the study area as well as at the main tourism information centres in large towns, the National Parks, and airports;
- Have large directional and locational signs made and ensure that these are strategically positioned at key tourist attractions/towns in the vicinity of the campsite;
- Ensure that the campsite is listed in all regional marketing collateral produced by the regional marketing body;
- To ensure positive word-of-mouth marketing always provide a quality service and products for guests; and
- If possible, make contact with tour operators that deal in the camping/budget traveller market and encourage them to make regular use of the community campsite. If necessary discounts may be offered to tour operators that bring large groups and/or make regular use of the campsite.

14.12 CONCLUSION

This preliminary marketing plan for the North West Region Tourism Master Plan is a brief review of the area's strengths, weaknesses, opportunities and threats and identifies potential target markets.

This plan is for discussion purposes and should serve as a base from which future discussions between the public and private sectors and the affected community are raised, in respect of developing an integrated marketing and action plan as well as an implementation strategy for the area.

Marketing the North West regions of Namibia requires not only above-the-line marketing but also below-the-line initiatives such as signage, maintaining quality, monitoring and ensuring that what is promised above the line is actually delivered.

It is important to stress that the responsibility of marketing the region lies with all stakeholders. Having a quality marketing strategy does little good if it is not supported and implemented on all levels. This includes good customer service and meeting the expectations of the tourists.
15.1 INTRODUCTION

The proposed Tourism Master Plan for the North West Region of Namibia suggests that planned tourism development be encouraged to promote the economic upliftment of the area. In order to achieve this economic upliftment funding is required to, inter alia:

- Plan tourism development;
- Monitor supply and demand in the tourism industry;
- Market the region as a tourism destination;
- Develop tourism related support infrastructure;
- Develop tourism plant in the region;
- Acquire and improve visitor management tools (informative and directional signboards, access control, etc);
- Monitor and conserve the cultural and natural environment (Limits of Acceptable Change); and
- Train and educate the local communities in hospitality and related services.

Funding for these initiatives may be achieved through:

- Public sector investment;
- Private sector investment;
- Donor or aid monies; and
- Contributions from visitors to the region via levies, entrance fees, etc.

Table 15.1 displays potential funding sources for the various initiatives identified.

The "Draft Tourism Policy for Namibia", January 1999, indicates that tourism development potentially has national government support, viz:

*Additional foreign and Namibian investment is required in certain areas, to help spread the benefits of tourism throughout the country. This is an important area for Government to exercise an interventionist role.*

- Attract tourism developments in areas in G184 need and with potential;
- Maintain and improve quality standards; e.g. support to refurbishment of infrastructure; award of recognised international standard accreditation;
- Promote the transfer of ownership and management capacity to Namibians;
- Promote investment in training and human resource development;
- Encourage private sector expenditure on marketing Namibia;
- Create tourism development incentive guidelines."

Thus the Namibian government is aware of its responsibility in terms of tourism development in the North West and other regions. It is important that local government and other role-players in the region's tourism industry harness the potential national funding opportunities allocated for the region.

<table>
<thead>
<tr>
<th>Table 15.1: Funding Sources</th>
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<tbody>
<tr>
<td><strong>Funding Requirements</strong></td>
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<td>Tourism Planning</td>
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</table>

It is believed that initially most of the planning and monitoring funding responsibilities would fall on national and/or local government shoulders. These initiatives may be
funded via donor or aid monies or alternatively from contributions from the national
government. As the area starts to develop and the private sector become more
involved in development, some of the funding responsibilities may shift partially towards
the private sector and/or tourists visiting the region.

A portion of entrance fees charged for access to conservancies and/or a bed-levy may
further contribute towards the ongoing funding requirements of the region. In addition,
it is recommended that all taxes and other levies that accrue from tourism
establishments in the region should be ring-fenced i.e. ploughed back into the region.
However, before this can be achieved private investors must first be encouraged to
invest in the region. Possible methods of attracting private sector tourism investment to
the region are discussed hereunder.

15.2 INCENTIVES

There are a number of factors that result in tourism industry investments being
considered high risk and requiring high returns. Most critical of them are:

- the often large amounts of capital required; and
- the cyclical nature of the industry subject to many uncontrollable factors —
  international or local recession, international events (e.g. Gulf War), strikes (e.g. air
  traffic controllers) disease (e.g. outbreaks of cholera), natural disasters (e.g. floods
  and hurricanes) and perceptions of incidents of crime and violence.

In addition the industry is characterised by significant, high levels of competition both
within southern Africa, and internationally, resulting in sophisticated and expert marketing
and operating skills required in a specialised and complex industry.

These factors result in the investor requiring higher than average returns for entering a
high risk industry. However, often the current tourist market related tariffs and project
capital costs do not add-up to sufficiently high returns to entice private sector investors to
enter the market. Some spectacular financial failures in the industry and very many small
unpublicised failures, have added to a general conservative approach of investors to
tourism projects.

In addition, the focus of tourism development policy is to foster the empowerment of
previously disadvantaged individuals and communities through the growth of the tourism
industry. The established private sector sees many of the required actions to facilitate
such empowerment as both adding additional costs to project start-up and operating
phases and increasing risks. They are therefore not very likely to pursue such empowerment of their own volition.

It can be argued that under conditions of sustained growth in demand, insufficient supply will drive up rates and prices to levels that will, in due course, justify the development of more tourism facilities and services. This sound economic theory might manifest itself in the longer term, but many developments such as hotels cannot be quickly brought on stream. In the meanwhile, potential tourists - and the jobs, forex and economic growth they imply - might be temporarily, or permanently, diverted to other destinations.

15.3 TYPES OF INVESTMENT INCENTIVES USED IN TOURISM AROUND THE WORLD

A wide variety of investment incentives are available, which are essentially categorised into financial, fiscal or other forms of incentives.

Fiscal incentives are statutory measures that attempt to make the investment climate within a country more appealing to investors, for example, reduced tax rates, accelerated depreciation, etc. Provincial and local authorities have little control over fiscal policies and can, at most, lobby for a bill to be tabled in parliament containing proposed fiscal incentives. It is apparent, therefore, that provincial and local authorities should concentrate more on other types of incentives, as these are the incentives that the regional authorities have the most control over.

Financial incentives attempt to alleviate the pressure that raising capital funding, high inflation rates, a declining local currency, lead-time between development and profit, and the high cost of borrowing creates on investors. Financial incentives normally come in the form of governmental grants or preferential loans.

Other investment incentives include any support services offered by government that help to attract investors to a specific country, region or industry. These could range from supportive marketing authorities to the relaxing of foreign exchange controls.

Attracting investors is not merely a matter of tax concessions and funding, creating the right sort of environment that supports development and promotes stability is paramount. Of interest is the availability and competence of the support services. If properly managed these services can provide a secure and accurate information source and council for any developments.
15.4 FACTORS INFLUENCING CHOICE OF INCENTIVES

When considering investment incentives, it is important to look at the following factors:
- Whether the incentive is to attract foreign or local investors, or both;
- Whether the incentives are to apply to all investments in an industry, or whether the incentives are to be sector specific and promote investment in targeted sectors within an industry;
- Whether the incentives are to be area specific in order to promote development in previously disadvantaged regions that are lacking in infrastructure, or whether the incentives are to promote investment in all areas;
- What the focus and ultimate aim of the investment is to:
  - develop the local workforce?
  - develop/enhance technology?
  - encourage Small Medium and Micro Enterprises ("SMMEs")?
  - encourage community tourism initiatives?
  - encourage foreign investment? or
  - a combination of the above?

and, should the incentive be outcome specific, i.e. offered to developments that plan to source a defined percentage of their inputs from local SMMEs owned by local communities etc.?
- Which type or combination of incentives to offer – fiscal, financial or other? and,
- How to create an environment that encourages and promotes investment.

The attitude towards the above factors will form the basis for an investment incentive policy which will in turn influence the decision of which type of incentives to offer.

15.4.1 ORIGIN OF INVESTMENT

Attracting foreign investment as opposed to local investment has many advantages, the most important being the fact that foreign capital is brought into the country. For tourism developments, foreign investment could also bring (attached to the actual funding), opportunities to attract visitors from the destination where the financing originates. Local investors, on the other hand, have the advantage that they are more active in contributing to local development as they have a greater interest in a strong and stable community.

Given the limited base of local investors, we recommend that the North West region targets a combination of foreign and local investment.
15.4.2 SECTOR AND/OR AREA SPECIFIC

As the Master Plan looks at tourism development specifically, it is recommended that investment incentives be tourism specific, but applicable to all tourism sectors, including direct suppliers to tourism operators as well as actual providers of tourism facilities and services. That is, aimed not only at tourism operators but also tourism support industries. This will require a well-worded definition of a tourism enterprise in the broader sense.

Area specific incentives offer government the opportunity to target the underdeveloped and disadvantaged areas. By offering incentives for development in specific undeveloped areas, it is possible that community advantages through tourism development could be maximised.

In areas that lack certain infrastructure, sector specific (within tourism) incentives could be effective, for example, incentives to develop additional tourist attractions in an area that has an oversupply of accommodation but a lack of attractions, etc.

15.4.3 INCENTIVES ACCORDING TO DESIRED OUTCOME

The application of incentives according to a desired outcome such as levels of local employment, support of SMMEs, community ownership, skills transfer, etc is an attractive alternative to encourage investment towards achieving desired development policy. It is however difficult to define in advance the exact expected outcome, especially if this involves multi-dimensional possibilities as in community involvement and benefits. In addition it is difficult to measure and police the desired outcomes, e.g. establish that a certain percentage of inputs are sourced from SMMEs and that that level is maintained etc. Whilst being therefore an appealing solution to policymakers, they are very difficult to successfully implement. However, in the case of Namibia’s North West region, where the local communities are economically depressed, careful consideration could be given to incentives based on desired outcomes.

15.4.4 NATURE OF INCENTIVES

When looking at what type of incentives to offer investors, it is obvious that a combination of fiscal, financial and other incentives is best.
In addition to straight financial incentives, local governments have the option to provide other financial incentives in kind. These include the provision of public-sector owned land at low or no cost/rentals, levy and rate holidays, provision of services at reduced rates. On their own each of these may seem insignificant, but to a small start-up business in a high risk industry, they can be meaningful. In particular, the provision of land at no cost can be a significant incentive for many projects.

15.4.5 THE INVESTMENT ENVIRONMENT

The environment within which development must take place is the deciding factor when trying to determine where and what to invest. The political stability of the area/country, the developmental infrastructure (roads, shops, municipal services, etc.), the service levels attained and anticipated, the training provided and expected, as well as the overall business environment of the region will all influence the investment decision. These are all, in actual fact, the other types of incentives that a region can offer.

It is the most important duty of local authorities to create and maintain a stable and attractive environment that will bring continuous investment into viable projects. Aspects such as service levels, training, legislation and the availability of support industries all add to a positive investment environment.

15.5 RECOMMENDED INCENTIVES

It is our opinion that creating the right type of investment climate would be the most effective incentive that could be offered by the region to potential investors. This would include:

- Maintaining a stable and secure political, social and economic environment which helps to create a positive investment environment;

- Providing facilitation and investment assistance to potential investors. Subsidised feasibility studies and environmental impact studies for tourism developments with strong empowerment potential should be considered;

- Financial incentives (or incentives in kind) that assist in securing funding or improving viability, for feasible, environmentally responsible developments that create jobs and contribute to the Gross Geographic Product (GGP) should be offered to investors for development where previously disadvantaged individuals
can benefit from empowerment through community involvement or SMME opportunities.

- The Local Government should lobby the National Government for the following incentives:
  - Corporate tax should be reduced for tourism developments in order to attract investment, particularly foreign investment; and
  - Preferential tax rates should be offered in identified areas for specific development, which might include development that produces the required outcomes in terms of empowerment.

The following are not direct investment incentives, but attention paid to these issues will, assist in promoting a positive investment environment for tourism development:

- Service standards play an important role in attracting tourism and should be continually monitored and standardised;

- High levels of health and sanitation, while not actively attracting investors, will dissuade investment if not there.

Whatever incentives and allowances may be requested or granted, a few underlying principles should be adhered to:

- the incentives should be structured so as to allow existing, as well as new, developers and operators to benefit;

- they should ensure that market forces determine the type, size and quality of any new developments or operations - not the incentive alone;

- they must meaningfully improve the investor’s, owner’s or operator’s return; and

- there should be safeguards to prevent their abuse.

The applications for any type of incentive should include detailed market and financial feasibilities, environmental and impact assessments and a quantified assessment of the economic and social benefits (direct spending, foreign exchange, taxes, jobs, supporting
industry opportunities, community involvement, etc) that will accrue from the development.

Incentives should only be considered where a tourism industry project is viable in market terms, will provide the desired additional economic empowerment and social benefits, but will not produce returns sufficiently high enough to interest private sector investors.

In summary, the local government should:

- Ensure a stable political, social and economic environment;
- Provide excellent investor facilitation and assistance services;
- Selectively, within the tenets of this framework, provide as many direct incentives-in-kind as possible to identified tourism projects with measurable strong empowerment potential; and
- Lobby national government for stronger incentives for appropriate tourism development.
ANNEXURE "A"

COMPARATIVE ECONOMIC ASSESSMENT

TABLE
COMPARATIVE ECONOMIC ASSESSMENT - CAMPSITE

1. General assumption

   Average annual inflation 7%

2. Campsite assumptions

<table>
<thead>
<tr>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
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<tbody>
<tr>
<td>Average number of sites</td>
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<td>96</td>
<td>103</td>
<td>110</td>
<td>117</td>
<td>126</td>
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<tr>
<td>Average number of beds</td>
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<td>0</td>
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<tr>
<td>Average development cost (incl. Land lease) N$ million</td>
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<td>9</td>
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<td>12</td>
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<tr>
<td>Average annual occupancy</td>
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<td>Average double occupancy</td>
<td>200%</td>
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<td>Average rack rate (all inclusive) N$</td>
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<td>10</td>
<td>10</td>
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<tr>
<td>Average travel agent and tour operator discount</td>
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3. Revenue projections

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<tbody>
<tr>
<td>Estimated total annual revenue after discounts and Sales N'$000's</td>
<td>90</td>
<td>96</td>
<td>103</td>
<td>110</td>
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<tr>
<td>Estimated discounts paid N'$000's</td>
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<tr>
<td>Estimated Sales Tax paid N'$000's</td>
<td>9</td>
<td>10</td>
<td>10</td>
<td>11</td>
<td>12</td>
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<td>Total estimated revenue N'$000's</td>
<td>90</td>
<td>106</td>
<td>113</td>
<td>121</td>
<td>129</td>
<td>138</td>
</tr>
</tbody>
</table>

4. Employment assumptions

   Estimated number of employees/site 0.25
   Estimated number of employees/campsite 3

   **Employment Skills Levels**

   - high-level occupations 0%
   - mid-level occupations 5%
   - semi-skilled and unskilled occupations 95%
   - 100%
### Comparative Economic Assessment - Campsite Cont.

#### 4. Employment Assumptions Cont.

**Average salary per month per direct or indirect employee**

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<thead>
<tr>
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<th>1999</th>
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</thead>
<tbody>
<tr>
<td>Mid-level occupations</td>
<td>N$pm</td>
<td>600</td>
<td>642</td>
<td>687</td>
<td>735</td>
<td>786</td>
<td>842</td>
</tr>
<tr>
<td>Semi-skilled and unskilled occupations</td>
<td>N$pm</td>
<td>450</td>
<td>482</td>
<td>515</td>
<td>551</td>
<td>590</td>
<td>631</td>
</tr>
<tr>
<td>Average for all occupations</td>
<td>N$pm</td>
<td>460</td>
<td>492</td>
<td>527</td>
<td>564</td>
<td>603</td>
<td>645</td>
</tr>
</tbody>
</table>

#### 5. Estimated Salaries/Wages

<table>
<thead>
<tr>
<th></th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mid-level occupations</td>
<td>N$'000's</td>
<td>1.1</td>
<td>1.2</td>
<td>1.2</td>
<td>1.3</td>
<td>1.4</td>
<td>1.5</td>
</tr>
<tr>
<td>Semi-skilled and unskilled occupations</td>
<td>N$'000's</td>
<td>15.4</td>
<td>16.5</td>
<td>17.6</td>
<td>18.9</td>
<td>20.2</td>
<td>21.6</td>
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<tr>
<td>Total annual salaries</td>
<td>N$'000's</td>
<td>16.5</td>
<td>17.6</td>
<td>18.9</td>
<td>20.2</td>
<td>21.6</td>
<td>23.1</td>
</tr>
</tbody>
</table>

#### 6. Taxation Assumptions

- **Sales Tax**
  - Average % turnover equal to taxable profits: 10%
  - Average corporate tax rate: 35%
  - Average PAYE/SITE personal tax rate:
    - Mid-level occupations: 15%
    - Semi-skilled and unskilled occupations: 10%

#### 7. Estimated Taxes Paid

<table>
<thead>
<tr>
<th></th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales Tax</td>
<td>N$'000's</td>
<td>9</td>
<td>10</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
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<tr>
<td>Corporate taxes</td>
<td>N$'000's</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Personal taxes</td>
<td>N$'000's</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Total taxes paid</td>
<td>N$'000's</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td>17</td>
<td>18</td>
<td>19</td>
</tr>
</tbody>
</table>
## COMPARATIVE ECONOMIC ASSESSMENT - CAMPSITE Cont.

### 8. Estimated direct revenue accruing to community pa

<table>
<thead>
<tr>
<th>% employees ex community</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of direct employment at campsites</td>
<td>3</td>
</tr>
<tr>
<td>Salaries and wages</td>
<td>N$'000's 16</td>
</tr>
</tbody>
</table>

#### Rental and equity participation

<table>
<thead>
<tr>
<th>Assumed community has ownership in camp</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corporate profits</td>
<td>N$'000's 10</td>
</tr>
</tbody>
</table>

**Estimated total revenue accruing to the community**

| N$'000's | 26 |

### 9. Estimated Total Direct and Indirect Contribution to Regional GDP during Construction

**1999**

<table>
<thead>
<tr>
<th>GDP</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total development cost</td>
<td>N$ million 0.2</td>
</tr>
<tr>
<td>Estimated regional income multiplier</td>
<td>1.0</td>
</tr>
<tr>
<td>Net income to the regional GDP</td>
<td>N$ million 0.2</td>
</tr>
</tbody>
</table>

### 10. Estimated Total Direct and Indirect Contribution to Regional GDP and Employment during Operations

<table>
<thead>
<tr>
<th>GDP</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total direct expenditure</td>
<td>N$ million</td>
<td>0.10</td>
<td>0.11</td>
<td>0.11</td>
<td>0.12</td>
<td>0.13</td>
<td>0.14</td>
</tr>
<tr>
<td>Estimated regional income multiplier</td>
<td>1.25</td>
<td>1.25</td>
<td>1.25</td>
<td>1.25</td>
<td>1.25</td>
<td>1.25</td>
<td>1.25</td>
</tr>
<tr>
<td>Net income to the regional GDP</td>
<td>N$ million</td>
<td>0.12</td>
<td>0.13</td>
<td>0.14</td>
<td>0.15</td>
<td>0.16</td>
<td>0.17</td>
</tr>
</tbody>
</table>

#### Employment

| Estimated regional employment multiplier | 2.5 |
| Net contribution to employment in the region | 7.5 |
COMPARATIVE ECONOMIC ASSESSMENT - MID-MARKET LODGE

1. General assumption

   Average annual inflation: 7%

2. Lodge assumptions

<table>
<thead>
<tr>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average number of rooms</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average number of beds</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average development cost (incl. land lease)</td>
<td>N$ million</td>
<td>1.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average annual occupancy</td>
<td>55%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average double occupancy</td>
<td>85%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average rack rate (dinner, bed and breakfast)</td>
<td>N$</td>
<td>355</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average travel agent and tour operator discount</td>
<td>25%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average achieved rate</td>
<td>N$</td>
<td>258</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of rooms available pa</td>
<td>7300</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of beds available pa</td>
<td>14600</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of rooms sold pa</td>
<td>4015</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of beds sold pa</td>
<td>7428</td>
<td></td>
<td></td>
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<td></td>
</tr>
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</table>

3. Revenue projections

   Estimated total annual revenue after discounts and Sales
<table>
<thead>
<tr>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>N$'000's</td>
<td>1918</td>
<td>2052</td>
<td>2196</td>
<td>2340</td>
<td>2514</td>
<td>2690</td>
</tr>
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</table>

   Estimated discounts paid
<table>
<thead>
<tr>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>N$'000's</td>
<td>527</td>
<td>564</td>
<td>604</td>
<td>646</td>
<td>691</td>
<td>740</td>
</tr>
</tbody>
</table>

   Estimated Sales Tax paid
<table>
<thead>
<tr>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>N$'000's</td>
<td>192</td>
<td>205</td>
<td>220</td>
<td>235</td>
<td>251</td>
<td>269</td>
</tr>
</tbody>
</table>

   Total estimated revenue
<table>
<thead>
<tr>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>N$'000's</td>
<td>2637</td>
<td>2821</td>
<td>3019</td>
<td>3230</td>
<td>3456</td>
<td>3698</td>
</tr>
</tbody>
</table>

4. Employment assumptions

   Estimated number of employees/room: 1
   Estimated number of employees/lodge: 20

   Employment Skills Levels

   high-level occupations: 2%
   mid-level occupations: 18%
   semi-skilled and unskilled occupations: 80%

   100%
COMPARATIVE ECONOMIC ASSESSMENT - MID-MARKET LODGE Cont.

4. Employment assumptions Cont.

<table>
<thead>
<tr>
<th>Average salary per month per direct or indirect employee</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>high-level occupations</td>
<td>N$pm</td>
<td>4,000</td>
<td>4,200</td>
<td>4,580</td>
<td>4,900</td>
<td>5,243</td>
<td>5,810</td>
</tr>
<tr>
<td>mid-level occupations</td>
<td>N$pm</td>
<td>1,000</td>
<td>1,070</td>
<td>1,145</td>
<td>1,225</td>
<td>1,311</td>
<td>1,403</td>
</tr>
<tr>
<td>semi-skilled and unskilled occupations</td>
<td>N$pm</td>
<td>600</td>
<td>642</td>
<td>667</td>
<td>735</td>
<td>786</td>
<td>842</td>
</tr>
<tr>
<td>average for all occupations</td>
<td>N$pm</td>
<td>740</td>
<td>792</td>
<td>847</td>
<td>907</td>
<td>970</td>
<td>1,038</td>
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</table>

5. Estimated Salaries/Wages

<table>
<thead>
<tr>
<th>high-level occupations</th>
<th>N'$000's</th>
<th>19</th>
<th>21</th>
<th>22</th>
<th>24</th>
<th>25</th>
<th>27</th>
<th>29</th>
</tr>
</thead>
<tbody>
<tr>
<td>mid-level occupations</td>
<td>N'$000's</td>
<td>43</td>
<td>46</td>
<td>49</td>
<td>53</td>
<td>57</td>
<td>61</td>
<td>65</td>
</tr>
<tr>
<td>semi-skilled and unskilled occupations</td>
<td>N'$000's</td>
<td>116</td>
<td>123</td>
<td>132</td>
<td>141</td>
<td>151</td>
<td>162</td>
<td>173</td>
</tr>
<tr>
<td>Total annual salaries</td>
<td>N'$000's</td>
<td>178</td>
<td>190</td>
<td>203</td>
<td>218</td>
<td>233</td>
<td>249</td>
<td>267</td>
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</table>

6. Taxation assumptions

<table>
<thead>
<tr>
<th>Sales Tax</th>
<th>10%</th>
</tr>
</thead>
<tbody>
<tr>
<td>average % turnover equal to taxable corporate profits</td>
<td>10%</td>
</tr>
<tr>
<td>average corporate tax rate</td>
<td>35%</td>
</tr>
<tr>
<td>average PAYE/SITE personal tax rate:</td>
<td></td>
</tr>
<tr>
<td>high-level occupations</td>
<td>35%</td>
</tr>
<tr>
<td>mid-level occupations</td>
<td>15%</td>
</tr>
<tr>
<td>semi-skilled and unskilled occupations</td>
<td>10%</td>
</tr>
</tbody>
</table>

7. Estimated taxes paid

<table>
<thead>
<tr>
<th>Sales Tax</th>
<th>N'$000's</th>
<th>192</th>
<th>205</th>
<th>220</th>
<th>235</th>
<th>251</th>
<th>269</th>
<th>288</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corporate taxes</td>
<td>N'$000's</td>
<td>67</td>
<td>72</td>
<td>77</td>
<td>82</td>
<td>88</td>
<td>94</td>
<td>101</td>
</tr>
<tr>
<td>Personal taxes</td>
<td>N'$000's</td>
<td>25</td>
<td>26</td>
<td>28</td>
<td>30</td>
<td>32</td>
<td>35</td>
<td>37</td>
</tr>
<tr>
<td>Total taxes paid</td>
<td>N'$000's</td>
<td>284</td>
<td>303</td>
<td>325</td>
<td>347</td>
<td>372</td>
<td>398</td>
<td>426</td>
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</table>
COMPARATIVE ECONOMIC ASSESSMENT - MID-MARKET LODGE Cont.

8. Estimated direct revenue accruing to community per annum

<table>
<thead>
<tr>
<th>% employees ex-community</th>
<th>90%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of direct employment at lodge</td>
<td>18</td>
</tr>
<tr>
<td>Salaries and wages</td>
<td>N$'000's 100</td>
</tr>
</tbody>
</table>

Rental and equity participation

Assume that the lodge leases land from the community at a % of turnover

<table>
<thead>
<tr>
<th>Assumed lease percentage</th>
<th>10%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated annual lease charges</td>
<td>N$'000's 211</td>
</tr>
</tbody>
</table>

Assume community has ownership in lodge

<table>
<thead>
<tr>
<th>Assumed % ownership</th>
<th>25%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corporate profits</td>
<td>N$'000's 53</td>
</tr>
</tbody>
</table>

Estimated total revenue accruing to the community | N$'000's 424 |

9. Estimated Total Direct and Indirect Contribution to Regional GDP during Construction

1999

<table>
<thead>
<tr>
<th>GDP</th>
<th>N$ million</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total development cost</td>
<td>1.5</td>
</tr>
<tr>
<td>Estimated regional income multiplier</td>
<td>1.0</td>
</tr>
<tr>
<td>Net income to the regional GDP</td>
<td>1.5</td>
</tr>
</tbody>
</table>

10. Estimated Total Direct and Indirect Contribution to Regional GDP and Employment during Operations

<table>
<thead>
<tr>
<th>GDP</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total direct expenditure</td>
<td>N$ million</td>
<td>2.64</td>
<td>3.82</td>
<td>3.02</td>
<td>3.23</td>
<td>3.46</td>
<td>3.70</td>
</tr>
<tr>
<td>Estimated regional income multiplier</td>
<td>1.1</td>
<td>1.1</td>
<td>1.1</td>
<td>1.1</td>
<td>1.1</td>
<td>1.1</td>
<td>1.1</td>
</tr>
<tr>
<td>Net income to the regional GDP</td>
<td>N$ million</td>
<td>2.9</td>
<td>3.1</td>
<td>3.4</td>
<td>3.6</td>
<td>3.8</td>
<td>4.1</td>
</tr>
</tbody>
</table>

Employment

| Estimated regional employment multiplier | 2.5 |
| Net contribution to employment in the region | 50 |
COMPARATIVE ECONOMIC ASSESSMENT - UPMARKET LODGE

1. General assumption
   Average annual inflation 7%

2. Lodge assumptions
   Average number of rooms 12
   Average number of beds 24
   Average development cost (incl. Land lease) N$ million 2.5
   Average annual occupancy 50%
   Average double occupancy 85%
   Average rack rate (all inclusive) N$ 800
   Average travel agent and tour operator discount 25%
   Average achieved rate N$ 582
   Number of rooms available pa 4380
   Number of beds available pa 8760
   Number of rooms sold pa 2190
   Number of beds sold pa 4052

3. Revenue projections
   Estimated total annual revenue after discounts and Sales
     N$'000's 1999 2000 2001 2002 2003 2004 2005
     2357 2552 2699 2888 3090 3305 3538
   Estimated discounts paid
     N$'000's 1999 2000 2001 2002 2003 2004 2005
     646 694 742 794 850 909 973
   Estimated Sales Tax paid
     N$'000's 1999 2000 2001 2002 2003 2004 2005
     236 252 270 289 309 331 354
   Total estimated revenue
     N$'000's 1999 2000 2001 2002 2003 2004 2005
     3241 3468 3711 3971 4249 4546 4854

4. Employment assumptions
   Estimated number of employees/room 1.6
   Estimated number of employees/lodge 19 2
   Employment Skills Levels
   High-level occupations 2%
   Mid-level occupations 23%
   Semi-skilled and unskilled occupations 75%
   100%
COMPARATIVE ECONOMIC ASSESSMENT - UPMARKET LODGE Cont.

4. Employment assumptions Cont.

<table>
<thead>
<tr>
<th>occupational category</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>high-level occupations</td>
<td>4,000</td>
<td>4,280</td>
<td>4,580</td>
<td>4,900</td>
<td>5,243</td>
<td>5,610</td>
<td>6,003</td>
</tr>
<tr>
<td>mid-level occupations</td>
<td>1,000</td>
<td>1,070</td>
<td>1,145</td>
<td>1,225</td>
<td>1,311</td>
<td>1,403</td>
<td>1,501</td>
</tr>
<tr>
<td>semi-skilled and unskilled occupations</td>
<td>600</td>
<td>642</td>
<td>687</td>
<td>735</td>
<td>786</td>
<td>842</td>
<td>900</td>
</tr>
<tr>
<td>average for all occupations</td>
<td>760</td>
<td>813</td>
<td>870</td>
<td>931</td>
<td>996</td>
<td>1,066</td>
<td>1,141</td>
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</tbody>
</table>

5. Estimated Salaries/Wages

<table>
<thead>
<tr>
<th>occupational category</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>high-level occupations</td>
<td>18</td>
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<td>21</td>
<td>23</td>
<td>24</td>
<td>25</td>
<td>28</td>
</tr>
<tr>
<td>mid-level occupations</td>
<td>53</td>
<td>57</td>
<td>61</td>
<td>65</td>
<td>69</td>
<td>74</td>
<td>80</td>
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<tr>
<td>semi-skilled and unskilled occupations</td>
<td>104</td>
<td>111</td>
<td>119</td>
<td>127</td>
<td>136</td>
<td>145</td>
<td>155</td>
</tr>
<tr>
<td>Total annual salaries</td>
<td>175</td>
<td>187</td>
<td>200</td>
<td>215</td>
<td>230</td>
<td>246</td>
<td>263</td>
</tr>
</tbody>
</table>

6. Taxation assumptions

- Sales Tax
  - average % turnover equal to taxable corporate profits 10%
  - average corporate tax rate 10%
  - average PAYE/SITE personal tax rate 35%

7. Estimated taxes paid

<table>
<thead>
<tr>
<th>Tax type</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales Tax</td>
<td>236</td>
<td>252</td>
<td>270</td>
<td>289</td>
<td>309</td>
<td>331</td>
<td>354</td>
</tr>
<tr>
<td>Corporate taxes</td>
<td>63</td>
<td>88</td>
<td>94</td>
<td>101</td>
<td>108</td>
<td>116</td>
<td>124</td>
</tr>
<tr>
<td>Personal taxes</td>
<td>25</td>
<td>27</td>
<td>26</td>
<td>30</td>
<td>32</td>
<td>35</td>
<td>37</td>
</tr>
<tr>
<td>Total taxes paid</td>
<td>343</td>
<td>367</td>
<td>393</td>
<td>420</td>
<td>450</td>
<td>481</td>
<td>516</td>
</tr>
</tbody>
</table>
COMPARATIVE ECONOMIC ASSESSMENT - UPMARKET LODGE Cont.

8. Estimated direct revenue accruing to community pa

<table>
<thead>
<tr>
<th>% employees ex community</th>
<th>90%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of direct employment at lodge</td>
<td>17.28</td>
</tr>
<tr>
<td>Salaries and wages</td>
<td>N$'000's</td>
</tr>
</tbody>
</table>

Rental and equity participation

Assume that the lodge leases land from the community at a % of turnover

<table>
<thead>
<tr>
<th>Assumed lease percentage</th>
<th>10%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated annual lease charges</td>
<td>N$'000's</td>
</tr>
</tbody>
</table>

Assume community has ownership in lodge

<table>
<thead>
<tr>
<th>Assumed % ownership</th>
<th>25%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corporate profits</td>
<td>N$'000's</td>
</tr>
</tbody>
</table>

Estimated total revenue accruing to the community | N$'000's | 482 |

9. Estimated Total Direct and Indirect Contribution to Regional GDP during Construction 1999

<table>
<thead>
<tr>
<th>GDP</th>
<th>N$ million</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total development cost</td>
<td>2.5</td>
</tr>
<tr>
<td>Estimated regional income multiplier</td>
<td>1.0</td>
</tr>
<tr>
<td>Net income to the regional GDP</td>
<td>2.6</td>
</tr>
</tbody>
</table>

10. Estimated Total Direct and Indirect Contribution to Regional GDP and Employment during Operations

<table>
<thead>
<tr>
<th>GDP</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total direct expenditure</td>
<td>N$ million</td>
<td>3.24</td>
<td>3.47</td>
<td>3.71</td>
<td>3.97</td>
<td>4.25</td>
<td>4.55</td>
</tr>
<tr>
<td>Estimated regional income multiplier</td>
<td>1.11</td>
<td>1.11</td>
<td>1.11</td>
<td>1.11</td>
<td>1.11</td>
<td>1.11</td>
<td>1.11</td>
</tr>
<tr>
<td>Net income to the regional GDP</td>
<td>N$ million</td>
<td>3.6</td>
<td>3.8</td>
<td>4.1</td>
<td>4.4</td>
<td>4.7</td>
<td>5.0</td>
</tr>
</tbody>
</table>

Employment

| Estimated regional employment multiplier | 2.5 |
| Net contribution to employment in the region | 48 |
ANNEXURE “B”
ENDEMIC SPECIES
NUMBER OF ENDEMIC BIRDS

(Description based on the contribution of C J Brown, Alice Jarvis, Tony Robertson and Rob Simmons to: Biological Diversity in Namibia – a country study, Phoebe Barnard (editor) 1998)

Namibia's avifauna is fairly sparse, with a total of 658 species recorded, of which arid endemic species constitute a diverse and varied group. High avian diversity is found along the western escarpment between at the savanna and Namib biomes. River courses and their surrounds support especially high diversity in this ecotonal area.

Fourteen bird species are endemic or near-endemic to Namibia. Four are confined to the Namib Desert of which three occur in the study area. The other ten, also in the study area, are found along the escarpment and bordering the dry savanna.

Over 100 species endemic to southern Africa are found in Namibia. About 90 of these species are predominantly arid dwelling and many of their distribution ranges extend into the escarpment zone and the study area.

Important Bird Areas (IBA) have been identified by BirdLife International to identify and protect the most important bird areas in each country of the world. IBA sites within the north west area include: Mille 4 Saltworks, Cape Cross, Kunene River mouth, Epupa-Huacana, Hobatere, and Brandberg. Four of sites support globally threatened species while two support Namibian red data species. Hobatere, just east of the 150 mm isohyet within the study area, has enjoyed particularly close attention and is considered Namibia's best site for endemic birds.

The map indicates areas with up to ten endemic birds in a single quarter degree grid square. It is clear that, from the Namibian national perspective, the study area is important for endemic bird species and can be considered an overall endemic hot spot.

This map also indicates the topography in 300 m intervals, the study area encircled in red and the more sensitive western, arid area with less than 150 mm of rainfall that is indicated by the dashed dark-blue line.
NUMBER OF ENDEMIC MAMMALS

(Description based on the contribution of Mike Griffin to: Biological Diversity in Namibia – a country study, Phoebe Barnard (editor) 1998)

Namibia is known for its large mammals, some of which are threatened in other countries. In addition, it also supports a rich fauna of lesser known, often small mammals. Living in Namibia are 217 mammal species, of which 208 are terrestrial, and another 33 species are expected but not yet recorded. The species richness of mammals increases from the southwest to the north east, paralleling the rainfall gradient.

Fourteen species of mammals are endemic to Namibia. Eleven are rodents and small carnivores that are not well known. Most endemic mammals are found in the escarpment and the Namib, and 60% or more are rock dwellers. Two of these species occur south of the study area only, while the rest are expected to be found therein.

The map indicates that the number of endemics in the study area is not as high as in the southern part of Namibia which encompasses the mammalian hotspot of endemism at the Bruckkaros Crater. Nevertheless, up to eight endemic mammal species may be found in many of the quarter degree grid squares of the study area.

This map also indicates the topography in 300 m intervals, the study area encircled in red and the more sensitive western, arid area with less than 150 mm of rainfall that is indicated by the dashed dark-blue line.
NUMBER OF ENDEMIC PLANTS

(Description based on the contribution of Gillian Maggs to: Biological Diversity in Namibia – a country study, Phoebe Barnard (editor) 1998)

Namibia has a flora that is diverse and complex. A number of unusual taxa grow in the more arid parts of the country. Throughout the country, there appears to be a strong relationship between species richness and the number of endemic species present. The study area encompasses the recognised centre of endemism known as the Kaokoveld or Kaoko Escarpment.

A total of 4344 higher plant species and infra-specific taxa have been recorded in Namibia. A first estimation of endemic plant species in Namibia indicates a total of 687 species. Twenty three taxa are Kaokoveld endemics, with 75 near-endemics being shared between the Kaokoveld and Angola.

The Brandburg massif in the Erongo Region supports eight of its own endemic species and another 90-91 Namibian endemic species also grow there. Cool, moist conditions and the high altitude are thought to explain this high degree of endemism of the Brandburg flora.

The only gymnosperm in Namibia, Welwitschia mirabilis, is confined to the study area in Namibia although it is very common in south-western Angola as well.

This map also indicates the topography in 300 m intervals, the study area encircled in red and the more sensitive western, arid area with less than 150 mm of rainfall that is indicated by the dashed dark-blue line.
ANNEXURE "C"

REGISTERED MONUMENTS IN STUDY AREA
NATIONAL MONUMENTS IN THE KUNENE AND ERONGO REGIONS

National Monuments in the focus area
1. Petrified Forest (Khorixas)
2. Cottage of Dorsland Trekkers (Northern Kunene)
3. Brandberg area (Uis)
4. Rock paintings and engravings (Twyfelfontein)
5. Bushman Paradise Cave (Spitzkoppe)
6. Farm Verbrandeneberg (Uis)
7. Windmill (Otjimbingwe)
8. Powder Magazine (Otjimbingwe)
9. Rhenish Mission Church (Otjimbingwe)
10. Old Hotel Building (Otjimbingwe)
11. Fort Sesfontein and Cemetery (Sesfontein)

National Monuments outside focus area
1. Phillips Cave (Usakos)
2. Paula Cave (Omaruru)
3. Old railway engine number 652 (Walvis Bay)
4. Stone Tower (Outjo)
5. Franke Tower (Omaruru)
6. Rock engravings (Kamanjab)
7. Rock paintings (Omaruru)
8. Replica of original Cross (Cape Cross)
9. Marine-Denkmal (Swakopmund)
10. Nauila Monument (Outjo)
11. Woermann House (Swakopmund)
12. Battle field around Franke Tower (Omaruru)
13. Railway Station (Swakopmund)
14. Rhenish Mission Church (Walvis Bay)
15. Prison Building (Swakopmund)
16. Old Barracks (Swakopmund)
17. "Martin Luther" (Swakopmund)
18. Omeg-Haus (Swakopmund)
19. "Prinzessin Rupprecht Heim" (Swakopmund)
20. Kramersdorf Building (Swakopmund)
22. Ev. Lutheran Church (Swakopmund)
23. Façade of Rösemann Building (Karibib)
24. “Hohenzollern” building (Swakopmund)
25. Kubas Station building (Karibib)
26. Rhenish Mission House (Omaruru)
27. “Häbich buildings” (Karibib)
28. “Haus Woll” (Karibib)
29. “Hotel Zum Grünen Kranze” (Karibib)
30. “Proviantamt” (Karibib)
31. Kaiserbrunnen (Karibib)
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