# Using sustainable tourism indicators to manage scarce water resources in the Namibian Tourism Industry:

The case of two Wilderness Safaris camps in Namibia

# Introduction

- Aim: To demonstrate through a case study how sustainable tourism indicators can be used by tourism ventures to effectively measure and manage scarce water resources in:
  - Namibia
  - Southern Africa
  - Scarce water regions around the world

# Rationale for the study

- Global water usage has tripled over the last five decades.
- By 2025 it is predicted that 3 billion people will live in water scarce countries, due to population growth.

# Rationale for the study cont…

*"Tourism has expanded rapidly since World War II, today it is seen as an important part of global economic activity and a cornerstone of many national, regional and local economies"*

*(Keyser, 2009: 3)*

- *The business volume of tourism equals or even surpasses that of oil exports, food products or automobiles"*

*(UNWTO, 2011: 1)*

- *Tourism industry is the world's largest industry.*
  - *It accounts for 9% of the world's Gross Domestic Product (GDP)*
  - *It contributes $7 trillion US dollars to the global economy.*

*(WTTC, 2014)*

# Rationale for the study cont...

- The tourism industry is heavily dependant on water and is also a major consumer of fresh water resources.

- Any change in the availability of water and or the quality of a destinations water resources can pose a detrimental threat to the tourism venture

  (Gossling et al. 2012).

- "Consumption of water per capita by tourists is typically double to triple that of residents of destinations"

  (WTO, 2004, 165).

# Rationale for the study cont.

- The vast amount of water consumption at the hands of tourism results in numerous negative environmental impacts including, water-stress on local resources, depletion of ground water sources and water pollution.
- Despite these impacts there is also a lack of statistical data on tourism water use. (Gossling et al., 2011).
- Records on the industry's water use are largely unknown, as they have not been recorded.
- The rapid growth of the tourism industry, the growth in water use and the subsequent increase in various negative impacts on destination water resources, together with the lack of knowledge about the degree of these impacts, suggest that there is a need to determine the extent of such impacts in order to mitigate them effectively.

# Why Namibia?

- Namibia boasts a unique array of tourism offerings.
- Namibia's desert areas are highly sensitive.
- Which requires effective management to ensure environmental degradation is prevented.
- The Namib-Naukluft National Park boasts the largest conservation area in Africa.
- "Namibia's protected areas are without a doubt the country's most important tourism offerings and the income generated by tourism in the parks is vital for the on-going conservation of the area and provides livelihoods for those communities which surround them." (WTO, 2006, 9).

# Climate

- Namibia is the driest country in Southern Africa
- Low erratic rainfall (Oct-May)
- Mean annual rainfall around the study area averages 100mm (Jacobson et al. 1995).
  - 83% total rainfall evaporates
  - 14% used by vegetation
  - 2% contributes to runoff
  - 1% recharges ground water source

(Crerar and Bethune, 1992).

# Wilderness Safaris


- The company Wilderness Safaris operates camps and safaris across Southern Africa, including South Africa, Namibia, Botswana, Zimbabwe, Zambia, Malawi and the Seychelles.

- Wilderness Safaris is a conservation organisation and ecotourism company dedicated to responsible tourism in Southern Africa.

- Wilderness Safari's aim to share some of the most remote wilderness area on the African sub-continent, with guests from all over the world, in a way that lightly touches the environment but [leaves] a big imprint on [their] soul"

(Wilderness Safaris History, 2011).

# Little Kulala Camp and Kulala Wilderness Camp


The camps are situated in a highly sensitive desert environment

On the boarder of Namib Naukluft National Park

World's oldest desert

# Popular tourist attractions

- Sossusvlei
- Dead Vlei
- World's highest sand dunes:
  Dune 45, Big Daddy and Big Mamma

**Dead Vlei**

**Dune 45**

# Little Kulala Camp

- The camp is situated in a dry riverbed in the Kulala Wilderness Reserve
- The camp was designed to resemble Dead Vlei
- 5 star premier camp
- 11 thatched tents
- Accommodates up to 24 guests per night

# Kulala Wilderness Camp

- Situated 18 kilometres to the east of Little Kulala Camp
- KWC lies on the slope of a ancient volcanic  mountain in the Kulala Wilderness Reserve
- It is classified as an adventure camp, being more rustic and offering smaller rooms than LKC
- Ten semi permanent  tents
- Accommodates up to 22 guests per night

# Sustainable tourism indicators

- The World Tourism Organization (WTO) developed a guidebook in 2004 with a new approach to indicator development.
- Baseline indicators suggested by the WTO (2004) were selected to assess the sustainable performance of each camp in terms of their water use.
- According to the WTO (2004a), a good indicator must address key issues within a destination, should be practical to implement, and should be able to be used as a benchmark for future comparisons, both within the destination and with other destinations.
- They support better decision making.
- They assist in informing action plans for destination management.

# WTO Baseline issues and indicators

| Baseline issue | Baseline indicator[s] |
|---|---|
| Local satisfaction with tourism [Social] | Level of local satisfaction with tourism (local staff members) |
| Effects of tourism on communities [Social] | Percentage who believe that tourism has helped to establish new services or infrastructure |
| Sustaining tourist satisfaction [Economic] | Level of tourist satisfaction |
| | Perception of value for money |
| | Percentage of return visitors |
| Tourism seasonality [Economic] | Tourist arrivals per month (throughout the year, mean and peaks) |
| | Occupancy rates for accommodation by month |
| | Percentage of tourist industry jobs which are permanent or full-time (compared to temporary/seasonal jobs) |
| Economic benefits of tourism [Economic] | Number of local people employed (and ratio of men to women) in tourism |
| | Revenue generated & spent in the area |
| Energy management [Environmental] | Per capita consumption of energy from all sources (Overall and per person per day) |
| | Energy-saving measures |
| | Percentage of energy consumption from renewable resources |
| Water availability and conservation [Environmental] | Water use (total water volume consumed and litres per tourist per day) |
| | Water conservation measures (water saving, percentage reduced, recaptured or recycled) |
| Drinking water quality[Environmental] | Water treated according to international potable standards |
| Sewage treatment [Environmental] | Sewage treatment systems |
| Solid waste management (garbage) [Environmental] | Waste volume produced by the destination (tonnes per annum) (by month) |

# Issue: Water availability and conservation

# Indicator 1.1 Water use

(Total water volume consumed per camp per annum and litres per tourist per day)

- Main source of water is borehole water
- Secondary source of water is purchased bottled water
- LKC and KWC do not have any water meters installed to record the volume of water used
- Due high levels of calcium that calcified the meters

Little Kulala Camp

Kulala Wilderness Camp

# Indicator 1.1 Water use cont…

## Little Kulala Camp

- Store borehole water in three 10 000 litre tanks

## Kulala Wilderness Camp

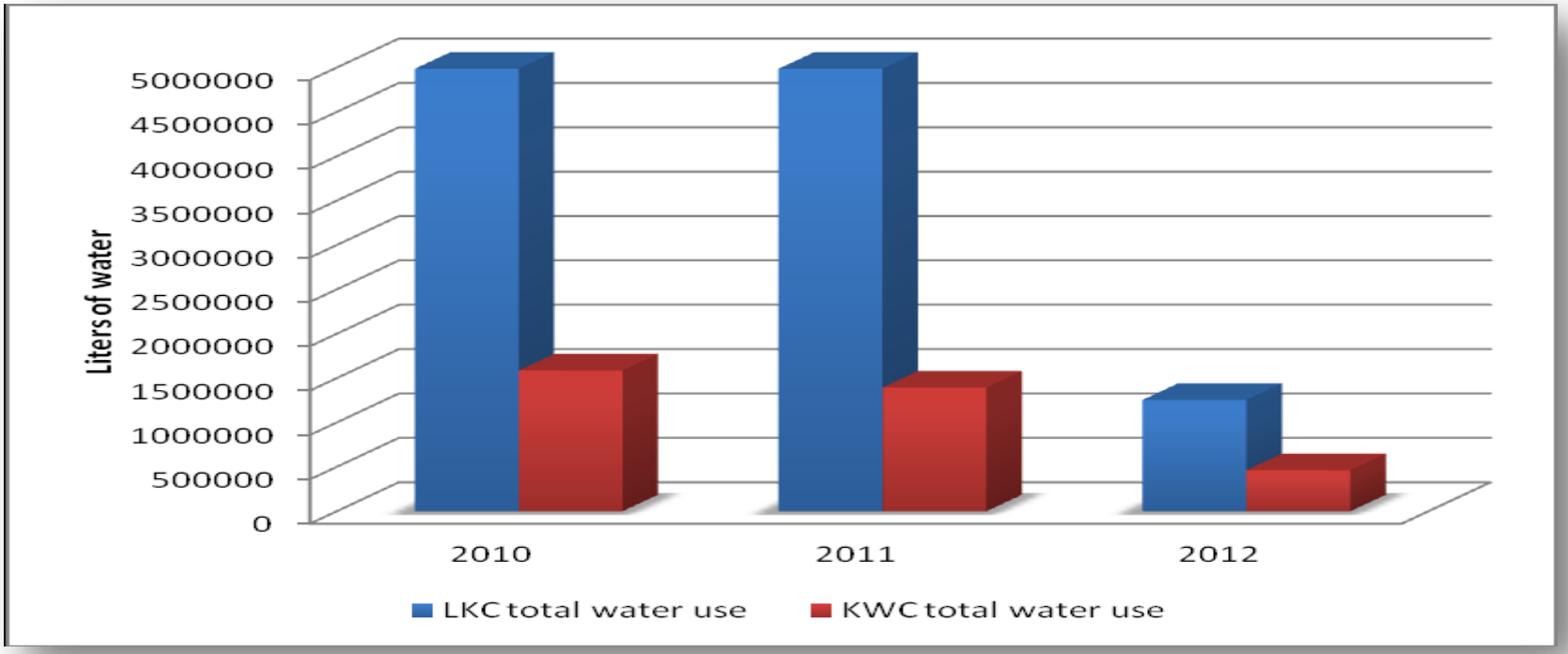
- Store borehole water in two 10 000 litre tanks

# Data collection

- Management provided estimated figures from (Jan 2010-April 2012)
- To determine the total volume of water consumed…
- Estimated data on borehole water use was added to the data obtained on the volume of bottled water consumed

# Indicator 1.1 Water use cont…

## Total water volume consumed per annum per camp




| Total volume water per camp | Little Kulala Camp (LKC) | Kulala Wilderness Camp (KWC) | Little Kulala Camp used |
|---|---|---|---|
| 2010 | 4.9 million litres | 1.5 million litres | 68% more |
| 2011 | 4.9 million litres | 1.3 million litres | 72% more |
| 2012 | 1.2 million litres | 461 000 litres | 63% more |

# Indicator 1.1 Water use: Daily per capita consumption per guest per day (in litres)

| | Little Kulala Camp (in litres) | Kulala Wilderness Camp (in litres) |
|---|---|---|
| Average water use per guest per day | 1 249 litres | 463 litres |

# Indicator 1.1 Water use: Per guest per day

- Tourism benchmarks have been developed to help provide tourism ventures with guidelines to measure their sustainable performance against international standards.
- To assess the level of sustainability of each camp, results were compared with an international benchmark (International Tourism Partnership).
- European international benchmarking standard for hotels.
- Such standards are ineffective when measuring emerging tourism ventures within the developing countries.
- The nature of tourism ventures in developing countries differ from those found in developed countries
  - In developing countries (Staff predominantly stay on the premises and therefore contribute to resource use, such as water and energy
  - In developed countries (staff do not stay at the destination but return home after their work shift)

# Indicator 1.1 Water use: Daily per capita consumption per person per day (in litres) cont…

| International Tourism Partnership (ITP) (2008)<br>Daily per capita water consumption in (litres) benchmark for hotels | | |
|---|---|---|
| **Excellent** | **Satisfactory** | **High** |
| Less than 200 | 200-250 | More than 250 |

| Average water use per person per day | Little Kulala Camp (in Litres) | Kulala Wilderness Camp (in Litres) |
|---|---|---|
| 2010 | 362 | 149 |
| 2011 | 350 | 142 |
| 2012 (Jan-Apr) | 260 | 133 |

# Reasons for the high water consumption???

- Reverse Osmosis to purify guest drinking water.
- For every 1 litre of water that undergoes reverse osmosis approximately 600ml comes away as waste water.
- Leaking water infrastructure
- Corrosion of water pipes and lime scale build up shower heads ect

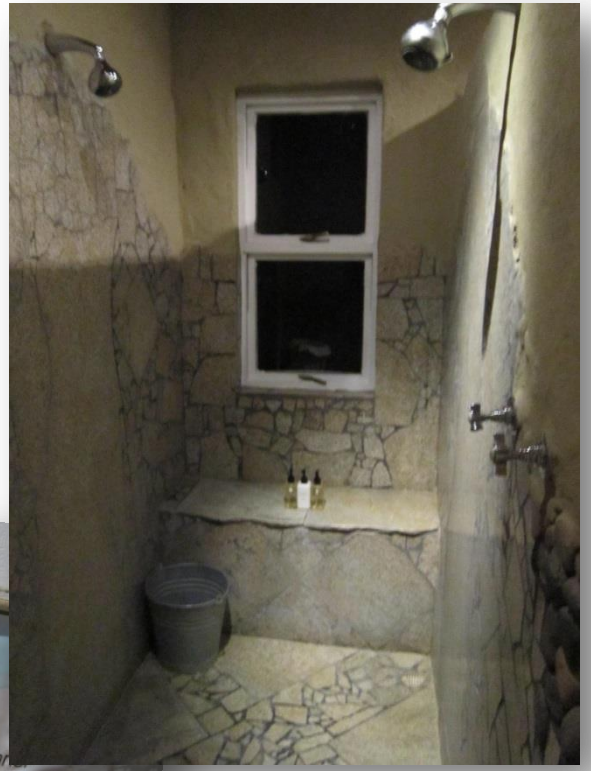
# Reasons Why LKC has a higher water consumption than KWC???

- Each guest room has a private plunge pool as well as one big pool at the main camp
- KWC has one big pool at main camp
- LKC employs 39 staff members KWC employs 27 members
- Lack of dual flush toilets in staff village
- Leaking infrastructure

# Issue 1.2: Water Conservation measures

# Indicator 1.2: Water conservation measures (water saving, percentage reduced, recaptured or recycled)

- Towel policy
- Water-saving measures
- Chemical policy



# Issue 3: Drinking water quality

# Indicator 3: Drinking water quality (Water treated to international portable standards)

- The quality of drinking water is an essential factor in terms of guest and staff wellbeing.
- This indicator was used to measure if the camps water was suitable for human consumption and did not pose a health risk to tourists and staff
- The water quality results were compared to the South African National Standard for drinking water quality in terms of the physical and macro-chemical characteristics

| Water quality determinant | Unit of measurement | Class I (recommended operational limit) | Class II (maximum allowed for limited duration) | Class III (maximum water consumption period*) | Results of LKC water quality analysis | Results of KWC water quality analysis |
|---|---|---|---|---|---|---|
| **Physical characteristics of LKC water** | | | | | | |
| pH value | pH units | 5.0 - 9.5 | 4.0 - 10.0 | No limit | 8.41 | 7.95 |
| Electrical conductivity (EC) | mS/m | <150 | 150 - 370 | 7 years | 175.60 | 110.60 |
| Total dissolved solids (TDS) | mg/l | < 1000 | 1 000 - 2 400 | 7 years | 1321 | 739 |
| **Macro-determinants (chemical characteristics of LKC water)** | | | | | | |
| Ammonium (NH4) | mg/I as N | <1.0 | 1.0 - 2.0 | No limit | 0.191 | 0.173 |
| Calcium (Ca) | mg/I | <150 | 150 - 300 | 7 years | 14.560 | 60.013 |
| Chloride (CI) | mg/I | <200 | 200 - 600 | 7 years | 252.7 | 99.3 |
| Fluoride (F) | mg/I | <1.0 | 1.0 - 1.5 | 1 Year | 4.592 | 1.732 |
| Magnesium (Mg) | mg/I | <70 | 70 - 100 | 7 years | 14.216 | 40.362 |
| Nitrate (NO3) | mg/I as N | <10 | 10 - 20 | 7 years | 3.038 | 2.273 |
| Nitrite (NO2) | mg/I as N | <10 | 10 - 20 | 7 years | 0.078 | 0.079 |
| Potassium (K) | mg/I | <50 | 50 - 100 | 7 years | 7.261 | 5.693 |
| Sodium (Na) | mg/I | <200 | 200 - 400 | 7 years | 438.66 | 160.22 |
| Sulphate (SO4) | mg/I | <400 | 400 - 600 | 7 years | 345.04 | 206.04 |
| Zinc (Zn) | mg/I | <5.0 | 5.0 - 10 | 1 Year | 0.004 | 0.004 |

# Recommendations

- From the application of the above indicators it was found that:
- In terms of water use LKC is unsustainable
- Both camps need to improve their conservation measures
- The water quality at LKC and KWC is unsustainable in terms of staff consumption.
  - The mineral properties associated with LKC and KWC's water has caused serious lime scale build up, corrosion and scaling.
  - Both camps water quality is unsustainable, as it is a source of unnecessary financial costs to maintain and replace plumbing infrastructure, due to corrosion, scaling cause by the high mineral content of the water.
  - Both LKC and KWC's must improve their water quality as it is unfit for staff consumption, due to the high level of fluoride in the water.
  - Possibly install water purification systems or use alternative source of water.
  - Educate staff on the negative impacts of drinking untreated water from the borehole.
  - Both camps need to accurately record their water consumption. However it is recommended that both camps install a water softening or condition systems close to the borehole water.
  - Water meters should only be installed after water has passed through water softening treatment.
  - Waste water from reverse osmosis should be recaptured, treated to remove unwanted chemical determinants and used in camps toilet s and showers.
  - Assess ground water source, to ensure they do not exhaust ground water reserves.

# Conclusion

- Despite the camps high water use, both camps are making an effort to conserve water through practical measures.
- There is a need to develop benchmarks for developing countries
- This data collected by the study can be used by the camps as baseline data to continually measure and improve their sustainable performance in the future.
- These indicators must be applied on a annual basis to measure if management plans have been effective and to monitor changes.
- These indicators can be used in tourism ventures across Southern Africa to help measure and monitor their water use.

# THANK YOU