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EXPLORING THE PERCEIVED FLOODING IMPACTS ON TOURIST ACCOMMODATION ESTABLISHMENTS IN THE LIMPOPO PROVINCE, SOUTH AFRICA

By

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533060

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School of Geography, Archaeology and Environmental Studies (GAES)

Ethics Clearance Number: H15/09/36

Supervisors: Dr Cheryl Chamberlain and Dr Clinton David van der Merwe

October 2017

NRF National Research Foundation

DECLARATION

I, **Mercia Patricia Southon**, declare that this Dissertation is my own, original, and unaided work. This dissertation is being submitted for the Degree of Master of Science at the University of the Witwatersrand, Johannesburg. This dissertation has not been submitted before for any degree or examination at any other University. I am the sole author thereof (save to the extent explicitly otherwise stated). The reproduction and publication thereof by the University of the Witwatersrand will not infringe any third-party rights and that I have not previously in its entirety or in part submitted it for obtaining any qualification.



Mercia Patricia Southon

__30th__day of __October_____2017____in Johannesburg, South Africa_____

As the candidate's supervisors, we certify the above mentioned and approve it as correct for submission.

_____

Cheryl Chamberlain

_____day of _____20_____in_____

_____

Clinton David van der Merwe

_____day of _____20_____in_____

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ABSTRACT

Climate and weather-related impacts have become widespread particularly affecting the tourism industry. Changes in the climate and weather lead to changes in tourist seasons, products and travel opportunities. Flooding has gained research attention over the past decade, since the destruction creates many challenges for tourism businesses. Floods are a growing global problem, increasing in terms of frequency of occurrence, property damages, business economic losses, and fatalities. South Africa has begun to experience many annual flood events both coastal and in-land, but the Limpopo Province has been declared as flood disaster area, since the increase in temperatures and precipitation. Interest now lies on how particular tourist destinations in the Limpopo Province can adapt to reduce flooding risks whilst increasing opportunities mainly for the economy. Debates around flooding costs, recovery processes, and adaptive capacities affirm to be more challenging for the tourism accommodation sector. The study aimed to explore the perceived flooding impacts on different types of tourist accommodation. Thus, to determine if floods hindered any tourist bookings, offerings, and tourist length of stay. The exploration verified the possible flood risks to vulnerable accommodation and no adequate adaptation plans. A purposeful sample of 145 tourist accommodation businesses located across three flood-prone regions of the Limpopo Province were selected to answer a semi-structured questionnaire to put across their flooding experiences from a management perspective. The semi-structured questionnaire was combined with telephone interviews and email responses. Coherent theme development within the theoretical framework was achieved through content analysis. Content analysis allowed for the critical discussion of deductive and inductive themes found in the results. Floods during peak-seasons threaten and affect tourist accommodation, leaving them behind in business. Those not affected benefit with increased tourist demand and new opportunities in the hospitality industry. Tourist accommodation businesses are exposed to flood risks and experience challenges to assess, recover and adapt from the direct and indirect impacts. Alongside the destruction of tourism in these regions, were concerns of the provision of flood mapping and flood management plans for tourism businesses. Wider flooding impacts on the environment and the surrounding local communities demonstrates a growing problem for the future.

Key words: floods; tourist accommodation; flooding impacts; risks; opportunities; tourist demand; adaptation; flood recovery, flood mapping, flood management plans.

DEDICATION

I dedicate this dissertation to all flood victims and for the survival of tourism in the Limpopo Province, South Africa.

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The journey to completing this project was one filled with many life lessons. Meeting various people from diverse backgrounds with their respective beliefs has taught me how to be adaptive and considerate of other people. This project provided me with many opportunities to attend events that were crucial for the development of my project. These events have allowed me to expand my professional network and improve the standard of my project.

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PREFACE

This research has been carried out strictly under the codes and conduct of the University of the Witwatersrand, under the supervision of Dr Cheryl Chamberlain and Dr Clinton van der Merwe. The research process took 24 months to complete as a full-time Masters student. The content provided is completed solely by the candidate; Miss Mercia Patricia Southon. The research ideas derive from the strong interest the candidate has for the environment and the development of tourism. Floods during the summer rainfall season in the Limpopo Province, South Africa have become a pressing issue, and the growth and development tourism in flood affected areas are increasing. The candidate is born and bred in the Limpopo Province and being able to witness the Province grow in her academic interest, tourism, found interest in the survival of the tourism accommodation sector during flooding events. This research focussed on the exploration of perceived flooding impacts on tourist accommodation in the flood-prone regions of the Limpopo Province.

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LIST OF ABBREVIATIONS

AFFS	:	African Flood Forecasting System
APFL	:	Applied Planning for Urban Flood Risk
APK	:	Adaptation of Spatial Planning to Climate Change
APFM	:	Associated Programme on Flood Management
ARIO	:	Adaptive Regional Input-Output Model
CC	:	Climate Change
CRED	:	Centre for Research on the Epidemiology
CSIR	:	Council for Scientific and Industrial Research
DTI	:	Department of Trade and Industry
DWA	:	Department of Water Affairs
ECORYS	:	Economic Research and Consulting Company
FHST	:	Flood Hazard-Scope Theory
FI	:	Flooding Impacts
Flood Site	:	Integrated Flood Risk Analysis and Management Methodologies
FRAM	:	Flood Risk Assessment and Management
FRMP	:	Flood Risk Management Plan
GAO	:	Government Accountability Office
GDP	:	Gross Domestic Product
GIS	:	Geographic Information Systems
GPS	:	Geographical Positioning System
GTA	:	Gauteng Tourism Authority
IFM	:	Integrated Flood Management
IPCC	:	Intergovernmental Panel on Climate Change
KfC	:	Knowledge of Climate Change
LAC	:	Limits of Acceptable Change
LED	:	Local Economic Development
LTA	:	Limpopo Tourism Agency
LDLEDT	:	Limpopo Department of Local Economic Development and Tourism

NDT	:	National Department of Tourism
NGO	:	Non-Governmental Organisation
PESTEL	:	Political, Economic, Socio-cultural, Technological, Environmental and Legal Factors
PCA	:	Paris Climate Agreement
SADC	:	Southern African Developing Countries
SAT	:	South African Tourism
SAWB	:	South African Weather Bureau
SAWS	:	South African Weather Services
TA	:	Tourist Accommodation
TALC	:	Tourism Area Life Cycle
TDZ	:	Tourism Development Zone(s)
TGCSA	:	Tourism Grading Council of South Africa
UNFCCC	:	United Nations Framework Convention on Climate Change
UNWTO	:	United Nations World Tourism Organisation
VAT	:	Value Added Tax
WEF	:	World Economic Forum
WRC	:	Water Research Commission
WRDMP	:	Waterberg Region Disaster Management Plan
WTO	:	World Tourism Organisation

LIST OF SYMBOLS AND UNITS OF MEASUREMENT

°C	:	Degrees Celsius
%	:	Percentages
-#	:	Minus figure/number
“”	:	Quotes/ Inverted commas for direct translation
° ‘“N/S	:	GPS coordinate (North, Longitude or South, Latitude)
N	:	North
E	:	East
S	:	South
W	:	West
ml	:	Millilitres
mm	:	Millimetres
cm	:	Centimetres
m	:	Metres
km	:	Kilometres
Ha	:	Hectares
ZAR	:	South African Rand
$	:	United States Dollar

1. CHAPTER 1: INTRODUCTION

"Onward speeds the mighty rivers,
in their mad and wild career;
down through cities, towns, and hamlets,
causing misery far and near." ~ George C. Rhoderick, Jr.

1.1. Introduction

How much time and funds are enough to recover from flooding impacts, since the tourist accommodation sector experiences both consequences and a few opportunities to avoid the associated risk? Considering the opportunities and risks faced by managers of various types of tourist accommodation, the local economic contribution remains vital to promote tourism development and growth in the Limpopo Province. This chapter introduces the research and includes the following:

- the background to the study,
- the flooding and tourism knowledge gap,
- the theoretical framework of the study,
- the problem-purpose statement of the study,
- the research question, aim and objectives,
- an account of the research study sites and research methodology,
- the research chapter outline and conclusion

1.2. Background to the study

The background to the study includes an overview on climate change and tourism, to understand the relationship between the two. This is followed by the discussion of the increasing nature of floods, and the threats posed to the tourism industry, including the accommodation sector. Lastly the flooding impacts on tourist accommodation are explored to understand the experienced consequences.

1.2.1. Climate change, weather and tourism

Tourism is climate sensitive and by nature, a place-dependent sector (Scott and Lemieux, 2010; Saarinen *et al.,* 2012; Crona *et al.,* 2013; Becken *et al.,* 2015). Tourism becomes sensitive to climate, when annual changes in weather occur. Changes in climate lead to changes in weather conditions across a variety of tourism destinations, regions and attractions (Vijayavenkataraman *et al.,* 2012). Global changes in climate affect numerous factors of tourism, making the industry highly dependent on weather (Belle and Bramwell, 2005; Gbetibouo and Hassan, 2005; Pang *et al.,* 2012; Kaján and Saarinen, 2013; Clar and Steurer, 2014; Komen *et al.,* 2015; Hambira *et al.,* 2016). Climate change has been affecting travel and tourism patterns, demands and products, especially nature-based resources (de Freitas and Marmaras, 2001; Mbaiwa and Mmopelwa, 2007; McEvoy *et al.,* 2008; Scott, 2011; Day *et al.,* 2013; Rossello-Nadal, 2014; Mereu *et al.,* 2015). Tourists simultaneously alter their travel decisions and motivations based on the weather at the tourist destination they would like to visit. Different weather patterns influences the seasonality of tourism, through the length and quality of operations and environmental conditions can either deter or attract tourists (Gómez Martín, 2005; Matzarakis *et al.,* 2013; Aylen *et al.,* 2014; Méndez-Lázaro *et al.,* 2014).

1.2.2. Floods

Flooding can be defined as an excess of water in particular areas due to heavy rainfall, hail and strong winds, and can be categorised as hazardous, devastating and costly to recover from (Pielke and Downton, 2000; Kundzewicz and Menzel, 2005; Scawthorn *et al.,* 2006; Ciscar *et al.,* 2011; Hapuarachchi *et al.,* 2011). Floods may cause large scale damages and may be associated with changes in climate. Floods are in most cases rainfall-derived and intensify as the rainfall increases (Asante *et al.,* 2007; Nicholls *et al.,* 2007; Ranger *et al.,* 2011). Floods further increase due to high temperature values and averages (Hirabayashi and Kanae, 2009; Wilby and Keenan, 2012; Kundzewicz *et al.,* 2013; Rossell and Santana-Gallego, 2014; Van Wilgen *et al.,* 2016). Global average temperatures are expected to rise between 1.4° C and 5.8 °C due to climate variability that affects the weather and rainfall patterns (Yu *et al.,* 2009; Ciscar *et al.,* 2011; Hart *et al.,* 2013; Becken *et al.,* 2015; Van Wilgen *et al.,* 2016).

Globally, over the past decade, floods affected countries including: Bangladesh, China, England, India, Germany, Madagascar, Malaysia, Pakistan, Poland, Thailand, the United States (Pielke and Downton, 2000; de Freitas and Marmaras, 2001; Few, 2003; Hall *et al.,* 2005; Suarez *et al.,* 2005; Jonkman *et al.,* 2008; Humanitarian Policy Group, 2009; Looney, 2012; Kundzewicz *et al.,* 2013; Cross and Cross, 2014; Fitchett and Grab, 2014; Ghaderi *et al.,* 2015). Current flood disaster and hazard studies show areas vulnerable to floods, remain affected after the event (Van Der Veen and Logtmeijer, 2005; Arbaiah, 2007; Huq *et al.,* 2007; Shafie, 2007; Badi'ah, 2010; Amelung and Nicholls, 2014). Disastrous floods have also affected parts of Africa, leaving many countries devastated. Floods recorded in Africa include: Botswana, Kenya, Malawi, Mozambique, Nigeria and Zambia (Awuor *et al.,* 2008; Olorunfemi, 2011; Faling *et al.,* 2012; Saarinen *et al.,* 2012; IPPC, 2012). Studies confirm that floods will become widespread across Africa, since the continent is currently experiencing severe impacts of climate change (IPCC, 2012; Kundzewicz *et al.,* 2013). African countries are prone to floods due to the high moisture content in the atmosphere, since the Indian and Atlantic Ocean, which influences the atmospheric pressure inland, encircle the continent (Douglas *et al.,* 2008; IPCC, 2012; Fitchett and Grab, 2014; Kruger and Douglas, 2015).

1.2.3. Tourism

Tourism is recognised as an industry, with a collection of services based on activities distributed and consumed across a wide range of sectors (Belle and Bramwell, 2005; Dwyer *et al.,* 2009; Gössling *et al.,* 2010; Lew, 2014; Hoogendoorn and Rogerson, 2015; Michalkó *et al.,* 2015). Tourism is the world's largest foreign exchange earner and significantly contributes to the economic growth of many countries (Amelung *et al.,* 2007; Schubert *et al.,* 2011; Rogerson, 2012; Saarinen and Rogerson, 2013; McKercher and Prideaux, 2014). The industry is gaining global importance with opportunities and developmental potential (Dwyer *et al.,* 2009; Hoogendoorn and Rogerson, 2015; Rogerson, 2015). Tourism currently contributes between 9% and 11% to global production and offers employment to over 220 million people (Becken and Hay, 2007; Gössling *et al.,* 2010; Filimonau *et al.,* 2011; Rogerson, 2012, 2013; Day *et al.,* 2013; Saarinen and Rogerson, 2013; Strambach and Surmeier, 2013; Giampiccoli *et al.,* 2015). Tourism significantly contributes to the gross domestic product (GDP) of developing sub-Saharan African countries, and is a valuable source of sustainable local economic development (Rogerson, 2013; Njoroge, 2014; Rogerson and Visser, 2014). The

positive impacts of tourism are demonstrated in peripheral regions mostly through socio-economic development (Telfer, 2002; Scott, 2011; Rogerson, 2012; Brouder, 2013; Espiner and Becken, 2014).

Tourism in South Africa is advancing and providing the country with sources of profit, investment and business (Rogerson and Sims, 2012; Song *et al.,* 2012; Rogerson and Rogerson, 2014). South Africa has begun to implement sustainable tourism approaches to foster local economic development (Rogerson, 2012; 2013a). South Africa is known in Africa as a tourist destination, since it has a vast array of natural, cultural and heritage tourism products and opportunities. Tourism attractions in South Africa are essential anchors for national tourism development in order to attract long-haul international tourists and domestic tourists (National Department of Tourism, 2011; Shaw *et al.,* 2012; Rogerson and Rogerson, 2014; Kruger and Douglas, 2015; Rogerson and Mthombeni, 2015). Domestic tourism in South Africa encourages and implements local marketing strategies to increase the local travel pattern and tourism opportunities (Lehto *et al.,* 2008; Strambach and Surmeier, 2013; Nikodinoska *et al.,* 2014; Rogerson and Rogerson, 2014; Kruger and Douglas, 2015).

Regional tourism has been increasing for the past decade in Southern Africa (Spenceley, 2008; Kiambo, 2014; Rogerson, 2015). Many regional tourists from outside South Africa include various regional travel reasons. Tourism in the Limpopo Province is an important business type that generates income and profits, to ensure long-term socio-economic stability and sustainability (Mbedzi, 2011; Rogerson, 2012; Myer and De Crom, 2013). Limpopo has been encouraging domestic travel, local spending, and cultural and heritage experiences. An average of 22% of South Africa's domestic tourists visit the Limpopo Province annually (Ladzani 2010; Kruger and Douglas, 2015). Local travel and tourism is accomplished in Limpopo though the natural, historic and cultural environments that generate accommodation demand (Nelwamondo, 2009; Rogerson, 2013; Bernard and Cook, 2015).

1.2.4. The tourism accommodation sector

Tourist accommodation plays a vital role in the local and national financial system of a country (Becken, 2005; Nelwamondo, 2009; Guizzardi and Bernini, 2012; Su *et al.,* 2012; Rogerson and Visser, 2014; Fitchett *et al.,* 2016). The global tourism industry cannot do without accommodation, since it is an important sector with high contribution returns (Su *et al.,* 2012;

Rogerson, 2013a; Faasen, 2014; Bernard and Cook, 2015). The need for accommodation services and facilities are large, since tourists want to stay for a certain period at different destinations. Tourist accommodation can be understood as the temporary housing or a place to stay with important supporting tourism services (Guizzardi and Bernini, 2012; Su *et al.,* 2012; Rogerson, 2013; Rogerson and Rogerson, 2014). Tourist accommodation is utilised for tourist stay, resting and recovery to ensure traveling to other points of interest to engage in related tourism activities (Su *et al.,* 2012; Rogerson, 2013b; Bernard and Cook, 2015). The majority of tourism businesses are locally owned in South Africa, whereas the accommodation sector shows an increase of 82% of local ownership since 2010 during the FIFA Soccer World Cup (Spenceley, 2006, 2008; National Department of Tourism, 2011; Rogerson, 2013b). Tourist accommodation facilities have increased in South Africa since 2010. Opportunities arise from the sector and an increase in tourist accommodation became evident, since it is a small start-up lucrative business.

In the Limpopo Province, tourist accommodation assist in forming an essential part of the overall tourism infrastructure of the Province (Sikhwari, 2008; Nelwamondo, 2009; Ladzani, 2010; National Department of Tourism, 2011). Tourist interest has gradually led to a heterogeneous pool of tourist accommodation services, emerging to offer different experiences, including; hotels, lodges, guest houses, bed & breakfasts and self-catering accommodation services (Nelwamondo, 2009; Walmsley, 2011; Rogerson, 2013a; Faasen, 2014). Tourists are interested in different types of tourist accommodation services and facilities for various reasons. These businesses may be vulnerable to climate variability through changes in the weather, especially during floods and drought. Tourist accommodation are tourism businesses that are vulnerable to flooding impacts, based on their fixed assets. The vulnerability to climate variability can lead to a drop in tourist interest, reservations or bed-nights that affect profit, management and employment (Becken, 2005; Su *et al.,* 2012; Rogerson and Visser, 2014). Length of stay is of major importance to any tourism region, because longer stays are positively associated with the total earnings from tourist activities and more bed-occupancy rates (Thrane and Farstad, 2009; Barros *et al.,* 2010; Kruger and Saayman, 2014). Identifying the factors that encourage tourists to stay longer is, therefore beneficial to any region seeking to increase visitor expenditure (Peypoch *et al.,* 2011; Tol and Walsh, 2012).

1.2.5. Flooding impacts on tourist accommodation

Possible flooding impacts include implications such as a loss in business, tourist numbers, damaged facilities and infrastructure, and high recovery and rebuilding costs (Weber, 2010; Fatti and Patel, 2013; Bernard and Cook, 2015). The impact of flooding has resulted in damage to the tourism industry (Agnew and Viner, 2001; Chandler, 2004; Espiner and Becken, 2014). The tourist accommodation sector has begun to experience the consequences of frequent flood events. After floods the tourist accommodation businesses are in loss and may face many challenges to recover. Research and investigations into flooding impacts on tourist accommodation have recently started to surface. Flooding impacts may make the tourist accommodation unsafe and communication during flood events may become interrupted including online booking systems.

Global flood event investigations currently include flooding impacts on tourist accommodation businesses (Nicholls *et al.,* 2007; Ranger *et al.,* 2011; Balica *et al.,* 2013; Walters *et al.,* 2014; Bangira *et al.,* 2015). Flooding research and analysis indicate that the field has expanded to include multiple dimensions of tourism, types of flooding impacts, mitigation, adaptation, vulnerability and policy to allow for critical integration (Ingirige *et al.,* 2008; Becken, 2013a; Godfred, 2015; Klijn *et al.,* 2015; Thiemig *et al.,* 2015). Flooding research and investigations have been done in Australia, England, India, Germany, the United States, and countries on the African continent (Few 2003; Nicholls *et al.,* 2007; Klijn *et al.,* 2015). The above-mentioned countries and areas are vulnerable to flooding impacts involving tourist accommodation. Mumbai in India, has been recorded as prone to floods, with evidence of severe disruptions, almost annually for the tourism industry and specifically tourist accommodation and attractions (Ranger *et al.,* 2011; Humanitarian Policy Group, 2009). Mumbai's tourist accommodation flooding impacts, included; increased vulnerability to flood hazards, damage costs on property, and flood water level duration (Nicholls *et al.,* 2007; Ranger *et al.,* 2011). The 2002 floods in Prague, the capital city of the Czech Republic reduced tourist numbers by one-third and combined cancellations of 30 000 reservations on accommodation and airline flights (Brázdil *et al.,* 2011; Filimonau *et al.,* 2011; Maharjan, 2014). In Australia floods impacted tourist accommodation infrastructure and tourist demand (Yeo, 2002; Pham *et al.,* 2010; Sharma and Franks, 2013). In 2005, hurricane Katrina hit the US city of New Orleans, that led to a drop in tourism (Henderson, 2005; Ritchie, 2008). Hotels were destroyed, rooms booked for new arrivals remained empty and the gravity of the flooding crisis was reflected on the hotel

occupancy rates with high rates of cancellations (Henderson, 2005; Hamzah *et al.,* 2012; Day *et al.,* 2013).

In Africa, flooding events in Malawi, 2014, lead to more than tourism and tourist accommodation damage, but also the destruction of land, livelihoods and the economy (Manhique *et al.,* 2015; Msyamboza *et al.,* 2016). In 2000, the Okavango Delta flooding resulted in the closure of the Moremi Game Reserve located centrally in the Delta, for eight months due to impassable tourist roads (Mbaiwa and Mmopelwa, 2007; Saarinen *et al.,* 2012). The floods destroyed tourism infrastructure, and limited tourist interest and mobility. Destructive floods can destroy tourism infrastructure including; roads, bridges and resorts, especially if materials used are not durable and updated (Nyaupane and Chhetri, 2009; Thiemig *et al.,* 2015). Recent floods in neighbouring country Mozambique, impacted the tourist accommodation sector and small tourism businesses, costing the local government millions of Rands to recover from the flood losses (Mondlane 2010; Maposa *et al.,* 2014b; Sitoe *et al.,* 2015). Lastly, floods in the Limpopo Province of South Africa have caused damage to tourist regions, attractions and activities (Reason *et al.,* 2005; Khandlhela and May, 2006; Asante *et al.,* 2007; Maposa *et al.,* 2014a; Fitchett *et al.,* 2016). Many flooding impacts on the tourist accommodation sector remain unknown, and research into the subject of floods and tourism is critical.

1.3. The flooding and tourism knowledge gap

Despite the growing threat of floods to tourism businesses and destinations, only a few tourism businesses are prepared enough to handle the impacts (Changnon, 1998; Few, 2003; Kyriakidis and Partner, 2008; Zahed *et al.,* 2014). The flooding impacts on tourism sectors have become widespread and expose the lack of mitigation plans. Flood mitigation plans include the perceptions, understanding and knowledge of weather characteristics that lead to floods. The reviewed literature on floods and tourism do not cover the enormity of the flooding impacts and the importance of tourism in the area (Becken and Hall, 2007; Werritty *et al.,* 2007; Becken, 2010; Wilby and Keenan, 2012; Hall *et al.,* 2015). Questions around the type of flooding impacts influencing tourist accommodation are still vague, misunderstood and not clearly assessed and evaluated. Flooding impacts are normally identified and calculated as a

whole on the tourism industry, but no focus is directed to particular sectors that carry the industry forward (Cohen, 2007; Sharma and Franks, 2013; Wyss *et al.,* 2014).

Flooding impacts on tourist accommodation include; damaged infrastructure, property and facilities, economic impacts on products and services, and high recovery costs (Agnew and Viner, 2001; Gasper *et al.,* 2011). Tourist accommodation flooding impacts do not solely cover the tourist demand, bookings, and length of stay; neither does it cover management perceptions, plans, mitigation, and the recovery period. The constant operation of tourist accommodation in destinations are vital for business maintenance and the contribution to the local economy (Olivier *et al.,* 2008; Njoroge, 2014). Several studies on flooding impacts on tourist accommodation appear in the reviewed literature chapter (*Table 2.1* on page 26).

The tourist accommodation sector has to identify their management and adaptation tasks during and after flooding events, to ensure successful recoveries. Studies have to identify the operation environment and the role of the tourist accommodation establishment. The tourist accommodation sector, especially in southern Africa, has to adopt new policies and regulations to adequately adapt to flooding event consequences (Hall, 2006; Pang *et al.,* 2012; Peeters and Landman, 2012). If research can emerge around this subject, wider flooding impacts on tourist accommodation can be explored to include the importance of tourism development, the environment and changes in climate and weather (Suarez *et al.,* 2005; Pang *et al.,* 2012; Espiner and Becken, 2014). Tourist accommodation managers should implement flood risk and disaster planning as a core competency tool for an in-depth understanding of extreme weather events and response plans (Faulkner, 2001; Hystad and Keller, 2006; Kellens *et al.,* 2013; Gómez-Martín *et al.,* 2014a). Tourist accommodation have to reflect and take into account their past flooding experiences to successfully manage flooding impacts, to ensure local tourism stability and sustainability (Kundzewicz *et al.,* 2013; Kruger and Saayman, 2014).

Flooding impacts on tourist accommodation are generally assessed and evaluated economically to understand the purpose and nature of the of the business (Changnon, 1998; Brody *et al.,* 2007; Atta-ur-Rahman and Khan, 2011; Kundzewicz *et al.,* 2013). The economic evaluation might only provide the costs to recover after flooding events, but does not include the wider direct and indirect flooding impacts on tourist accommodation (Wordsworth and Bithell, 2004; Zerger and Wealands, 2004; Musungu *et al.,* 2016). Without the wider flooding impact assessments and evaluation, tourist accommodation management cannot mitigate and adapt in

flood-prone areas (Nyaupane and Chhetri, 2009; Gouldby *et al.,* 2010; Ranger *et al.,* 2011; Guinea Barrientos and Swain, 2015).

1.4. The theoretical framework of the study

For a theoretically sound exploration of flooding impacts on tourist accommodation, a theoretical framework is required, with pertinent themes. The utilisation of theories and themes to outline frameworks, are useful to guide and structure the research and/or exploration process (Faulkner, 2001; Simon and Goes, 2011). Theoretical frameworks include carefully considered concepts, relevant for the study, reflecting on key processes and knowledge (Simon and Goes, 2011). For this study, literature related to flooding impacts, focus on the identification of direct and indirect impacts and their consequences to better understand tourist accommodation responses (Hamilton *et al.,* 2005; Yu *et al.,* 2009; Wyss *et al.,* 2014). The theoretical framework appears in the reviewed literature chapter (*Figure 2* on page 22). Research on flooding impacts on tourist accommodation is a relatively new and emerging focus, alongside climate change impacts on tourism (Tempelhoff *et al,* 2009; Hapuarachchi *et al.,* 2011; Musungu *et al.,* 2016). The majority of theory speculating flooding impacts, events, and recovery does not focus on themes suitable for tourism and related research themes. Current flood theories include flood risk modeling, disaster and management frameworks and policies, but only a few theories are relevant for the tourist accommodation sector. The tourism industry has disaster and demand flow models, but the combination of impacts, tourists and management is not yet fully structured.

Tourist demand models do not include the change in factors that determine the type of flooding impacts for the evaluation of tourist flows (Gössling *et al.,* 2012; Scott *et al.,* 2015; 2016). The magnitude of the flooding implications for tourism and recreation will depend upon vulnerability and adaptive ability to survive (Mirza, 2003; Kundzewicz *et al.,* 2013; Scott *et al.,* 2016). Tourism businesses should have a short term flood recovery plan to enable a swift return to operations (Shani and Arad, 2014; Guinea Barrientos and Swain, 2015). After speedy recoveries from floods, tourist accommodation businesses experience challenges with long term flooding impacts (Bartels *et al.,* 2007; Malhotra and Venkatesh, 2009; Turton *et al.,* 2010; Becken and Hughey, 2013; Fatti and Patel, 2013). The tourism sector responses and resilience should be fully assessed, alongside lessons learned from past flooding experiences (Hapuarachchi *et al.,* 2011; Ghaderi *et al.,* 2014; Zahed *et al.,* 2014; Scott *et al,* 2015). There

seem to be many reasons for a perceived increase in flooding impacts and adaptation plans. News about floods are communicated through media either on television, online, newspapers, and by word of mouth. Tourism managers may provide accurate and easily interpretable information to assess flooding impacts in economic, socio-cultural and environmental terms (Dwyer *et al.,* 2009; Yu *et al.,* 2009; Kundzewicz *et al.,* 2013).

1.5. The problem-purpose statement of the study

Floods have increasingly become a common natural disaster in the Limpopo Province (Rowberry *et al.,* 2011; Maposa *et al.,* 2014a; Musyoki *et al.,* 2016). Flooding impacts are becoming widespread in the tourism sector (Rowberry *et al.,* 2011; Nilsson and Gössling, 2013). The exploration of flooding impacts will assist in determining the possible changes in region attractiveness, tourist demand, tourism services, profits, and the importance of domestic tourism. The adaptive capacity of tourism accommodation businesses to flooding are weaker than other tourism businesses (Hamzah *et al.,* 2012; Guizzardi and Bernini, 2012; Becken, 2013b). The weaker flood adaptive capacity might be because accommodation businesses have more value in contributing assets including: tourist demand, natural resources and the location. The flooding impacts might have implications for tourist visitation, tourism development and management, and the region's contribution to tourism. The perception of flooding impacts by managers of tourist accommodation in South Africa need to be understood to prepare for future flood challenges (Filimonau *et al.,* 2011; Reddy, 2012; Kundzewicz *et al.,* 2013). Studies have been conducted to explore and assess the flooding impacts of coastal towns, but only a few focused on inland, rain-derived floods, since the changes in the weather pattern make it difficult to predict localised floods.

1.6. The research question, aim and objectives

The aim of this study is to explore the management's perception of flooding impacts on tourist accommodation in the Waterberg, Vhembe, and Mopani regions in the Limpopo Province, South Africa.

The objectives of this study are:

- To explore the tourist accommodation managers' perception of changes in tourist reservations in an event of a flood.
- To determine if the tourists' length of stay is affected during flooding episodes.
- To critically evaluate whether there are adaptation plans for tourist accommodation vulnerable to floods.

1.7. The research study sites and research methodology

The Limpopo Province has declared the Waterberg, Vhembe and Mopani regions as flood prone, due to the increased summer temperatures and rainfall (Komen *et al.,* 2015; Musyoki *et al.,* 2016). The Waterberg, Vhembe and Mopani regions creates a focus for the study to explore the perceived flooding impacts on tourist accommodation in the Limpopo Province. The Limpopo Province is characterised by subtropical climatic summer rainfall area with over 90% of the annual average mean precipitation occurring between October and April (Smithers *et al.,* 2001; Reason *et al.,* 2005; Sikhwari, 2008; Maponya, 2012; Komen *et al.,* 2015). The Limpopo Province receives high maximum daily temperatures that have an effect on the rainfall patterns, duration and intensity (Tshiala *et al.,* 2011; Malherbe *et al.,* 2014; Spaliviero *et al.,* 2014). Floods through heavy and prolonged rainfall in the Limpopo Province occur in the Waterberg, Vhembe, and Mopani regions. Figure 1 (below) presents the study regions' small towns: Lephalale, Bela Bela, Modimolle, Makhado, Thoyhandou, Musina, Tzaneen, Giyani, Ga-Phalaborwa, Haenertsburg, Letaba and Maruleng. The Limpopo River basin increases the flood vulnerability of the above-mentioned towns due to the changes of land-use and developments (Oyekale, 2005; Khandlhela and May, 2006; World Meteorological Organization, 2012; Mekiso *et al.,* 2013; Malherbe *et al.,* 2014).

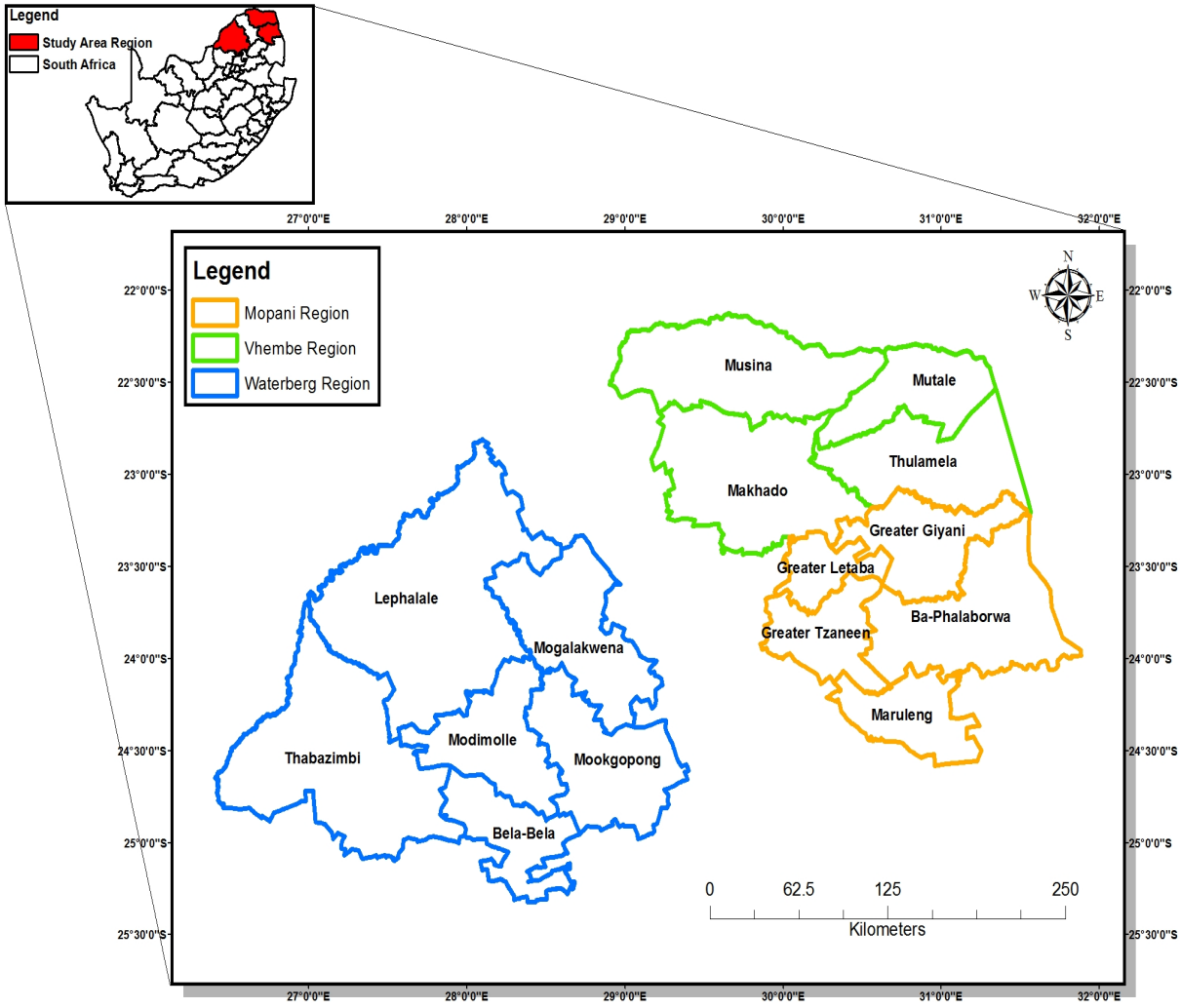

Figure 1.1: Map of the research study sites (Source: Researcher's Map, 2016).

The regions, Waterberg, Vhembe and Mopani are regarded as areas for tourism development and growth (Mafunzwaini and Hugo 2005; Spenceley, 2006; Boonzaaier and Philip 2007; Mbedzi, 2011). The regions offer tourism products and opportunities, especially nature and cultural tourism through the development of tourist accommodation to promote domestic tourism and local economic development (Conelius *et al.,* 2009; Spenceley, 2006; Mbedzi, 2011). The above-mentioned towns experience flashfloods and the overflow of the Mogol, Limpopo, Mutele, Mulalane, and Letaba rivers. Table 1 (below) presents the most recent recorded floods across the Limpopo Province, particularly between the years 2009 and 2015 (Asante *et al.,* 2007; Mondlane, 2010; Maposa *et al.,* 2014a; Komen *et al.,* 2015).

Table 1.1: A summary of the most recent flooding events in the research study regions:

Limpopo Region	**Town/Area**	**Flood type**	**Rivers/dams involved**	**Year**
Waterberg	Lephalale Bela Bela Modimolle	Flash floods and river/dam floods due to heavy rain.	Mogol River, two private dams	2016 2014 2013 2009
Vhembe	Makhado Thoyhandou Musina	Flash floods and river/dam floods due to heavy rain.	Limpopo River Mutele River	2016 2015 2013
Mopani	Tzaneen Giyani Ga-Phalaborwa Haenertsburg Letaba Maruleng	Flash floods and river/dam floods due to heavy rain.	Mulalane River	2015 2010 2011 2013

(Source: *Adapted from City Press, Mail & Guardian, News24 Online, SABC Online, and SAPA, Summer-Autumn 2014-2016*).

Flooding events occur in various provinces, regions and towns of South Africa, but the attention to flooding events in the Limpopo Province create a suitable exploration of flooding impacts on the tourist accommodation sector. There has been an increase in tourism offerings and opportunities in the Limpopo Province, and it has led to the rapid development of the tourism accommodation sector. Floods occur frequently in the Waterberg, Vhembe and Mopani regions and these regions experience expansion in tourist accommodation development. The three regions provide nature tourism, wildlife tourism, eco-tourism, educational tourism and cultural and heritage tourism offerings that attract tourists to the Limpopo Province. Floods have occurred across the three regions of the Limpopo Province since 2009, resulting from a combination of prolonged rainfall and the breaking of river/dam walls. The prolonged rainfall created flash floods in localised areas. The scale and intensity of the floods were not similar, however the events influenced tourism businesses. Some flood events were more severe than others, but the tourism industry in the three regions was affected. Tourism opportunities in the Limpopo Province have become the foundation of small business development, entrepreneurship and employment. Tourist accommodation businesses in the Waterberg, Vhembe and Mopani regions have become vulnerable to flooding events. The study made use of a qualitative survey research design and purposefully selected 145 tourist accommodation businesses across the study regions to participate in the study. A pilot study assisted in reducing the possible research limitations. A total of 119 tourist accommodation managers participated in the study through answering a semi-structured questionnaire, telephone interviews and email responses.

1.8. The research chapter outline

Chapter one:

The chapter introduces flooding as a hazard for the tourism accommodation sector. The chapter elaborates on the knowledge gap in the subject of tourism and flooding. The theoretical framework confirms the problem-purpose of the study, followed by the research aim, question, and objectives. The research study sites and methodology are accounted for followed by the research chapter outline and conclusion.

Chapter two:

The chapter includes reviewed literature to structure and understand the tourism accommodation sector flooding impacts and experiences. The chapter explores the climate and weather, floods, tourism, and the tourism accommodation sector.

Chapter three:

The chapter focuses on the research study sites and the methodology to gather and analyse the data. The chapter provides an understanding of flooding events on a local level across different regions, engaging in tourism activities in the Limpopo Province of South Africa. A pilot study is included to reduce the research limitations. The qualitative study employs content analysis to analyse the collected data according to themes considered to be relevant.

Chapter four:

The chapter discusses the results and the main research findings. The chapter includes the analysis and assessment of flooding impacts on tourist accommodation establishments through the inductive (theory related) and deductive (results related) coding and categorising of research themes. The chapter further aims to validate the findings linked the research questions and reviewed literature.

Chapter five:

The chapter concludes with the final research remarks and recommendations to allow for improved understanding of flood risks and disaster management for the tourism accommodation sector. The chapter includes the final key messages and arguments of the research, to understand the theoretical contribution to knowledge, the research management, and limitations. Lastly, the chapter discusses possibilities for future research.

1.9. Conclusion

The chapter provides an overview of the research and the structure of the research. The chapter explores the threats flooding events pose to the tourist accommodation sector. The research focusses on the perceived flooding impacts on tourist accommodation from a management's perspective. As a result, if tourist accommodation has been affected by previous floods, an exploration of what the direct and indirect impacts are conducted. The problem-purpose statement confirms that the tourism accommodation sector has a weak adaptive ability to handle flooding impacts. The exploration of perceived flooding impacts stipulates the importance of the difference in flood events, scale, frequency and location. The perception of flooding impacts can also shed light on the many overlooked wider impacts. Flash and river/dam floods have become a critical focus point for the survival of tourist accommodation businesses. Tourist accommodation experience different flooding impacts due to the magnitude and frequency of floods. Therefore, the theoretical framework provides research coherence and assists in structuring the research arguments. This study discusses the identified flooding impacts that either managers, owners or staff on duty perceive as either direct or indirect damage and how flooding affects the business operation and reservations, tourist length of stay and the adaptive management of the accommodation. The following chapter will explore literature relevant to the study.

2. CHAPTER 2: THEORETICAL FRAMEWORK: REVIEWED LITERATURE

"On through fertile plains and valleys,
on the raging billows ride;
carrying with them deep destruction,
and distress on every side." ~ George C. Rhoderick, Jr

2.1. Introduction

The reviewed literature explains the flooding impacts and experiences that the tourism accommodation sector is faced with through the use of a theoretical framework. The theoretical framework is adapted from the *Flood Hazard-Scape Theory* (Mustafa, 2005). The theory assists in exploring the flooding impacts on tourist accommodation establishments. The reviewed literature consists of four fundamental themes from the theory linked to the relevant themes of this study.

The central themes are:

- the flood hazard, linking flooding impacts to tourism;
- the flood exposure, linking floods to tourism demand;
- the flood vulnerability, linking floods to tourist accommodation establishment vulnerability and lastly,
- the flood capacity and measures, linking flood adaptation to tourist accommodation establishments.

The chapter includes the flooding impacts and the experiences that the tourism accommodation sector face, followed by flooding and tourism research. The flood risks include the nature of floods and the damages it causes. The chapter explores the different types of direct and indirect flooding impacts. The tourism accommodation sector is exposure to floods through tourist demand and tourist products. The chapter also covers the tourism accommodation sector's vulnerability to floods and the capacities of the sector to adapt to and manage flood damages. Lastly, the chapter includes the various ways to assessing flooding impacts, the challenges faced in assessing the flood impacts and the flood forecasting and information systems needed in the tourism sector. To conclude, the reviewed literature summarises past flooding impacts experienced by the tourism accommodation sector.

2.2. The tourism accommodation sector: flooding impacts and experiences

Flooding is a hazard which has associated risks for to the tourism accommodation sector. Climate change is known to be accompanied by catastrophic natural disasters and extreme weather events that could change the seasonality of tourism (Amelung *et al.,* 2007; Field *et al.,* 2012). Climate change has become a global phenomenon with research and planning interest on how to mitigate and adapt to it (Becken, 2005; Yohe *et al.,* 2007; World Tourism Organisation (WTO), 2009; Weaver, 2011; Vijayavenkataraman *et al.,* 2012; Pasquini *et al.,* 2013).

Climate change has allowed for extreme weather events in developing contexts through altering the frequency, scale and locality of these events and disasters, including; increased temperature, sea level rise, storms, river floods and drought (Mirza, 2003; Westra *et al.,* 2014; Yohe *et al.,* 2007; Hirabayashi and Kanae, 2009; Hay and Mimura, 2010; Klijn *et al.,* 2015;de Kumar, 2015). Climate change, therefore marks many developing countries as vulnerable to extreme weather events that may result in huge economic losses and damages (Mirza, 2003; Gbetibouo and Hassan, 2005). Climate change literature includes a focus on climate change impacts on tourism (Berrittella *et al.,* 2006; Shani and Arad, 2014). Current debates continue between climate change and tourism, as to who influences or contributes more (Gössling *et al.,* 2012; Hübner and Gössling, 2012; Nilsson and Gössling, 2013; Hall *et al.,* 2015). Tourism contributes to climate change, but the climate change impacts on the industry in turn affect tourism development (Gbetibouo and Hassan, 2005; Berrittella *et al.,* 2006; Yohe *et al.,* 2007; Walmsley, 2011; Gössling *et al.,* 2012; Shao, 2012; Njoroge, 2014). Literature on both phenomena addresses the awareness, risks and policies of climate change in a global and local developing context (Gössling *et al.,* 2010; Becken, 2013a; Hewitt, 2013; Pasquini *et al.,* 2013). Tourism development papers focus on the growing concern of flooding impact reactions (Ciscar *et al.,* 2011; Hübner and Gössling, 2012; Rogerson and Sims, 2012).

The impact of climate change on tourism interests tourism researchers, since it is most likely to shape the industry's future (Pang *et al.,* 2012). Future climate change impacts and links to tourism may include two geographical themes namely: climatology, and tourism potential and risks under certain atmospheric conditions (Hall, 2002; de Freitas, 2003; Gómez Martín, 2005; Gasper *et al.,* 2011; Hadwen *et al.,* 2011; Goh, 2012; de Kumar, 2015). Certain atmospheric conditions in areas of tourist interest are essential for tourism attractions and activities,

planning and development (de Freitas and Marmaras, 2001; Holmgren *et al.,* 2003; WTO, 2009; Yu *et al.,* 2009; Rogerson and Sims, 2012; Gómez-Martín *et al.,* 2014b).

A hazard can be seen as any potential source of danger or posing a risk to something or someone, in this case a flood hazard is seen as a form of danger and risk to the tourism accommodation sector (Kundzewicz and Menzel, 2005; Mustafa, 2005; Cioccio and Michael, 2007; Atta-ur-Rahman and Khan, 2011; Tsai *et al.,* 2013). Hazards are in most cases associated with the negative effects, consequences, or influences that are risks. Developing countries are affected by many climate change hazards, but increased storm events and infrastructure development may cause long-term flooding (Gbetibouo and Hassan, 2005; Lehto *et al.,* 2008; Hein *et al.,* 2009; Wilby and Keenan, 2012). Flood hazards are the projection of the potential flood damages on potential elements exposed to floods (Balica, 2012). Flooding impacts on the tourism accommodation sector lead to a business decline (Yeo 2002; Van Der Veen and Logtmeijer, 2005; Bernard and Cook, 2015). Although, flooding research include advances and improvements in modeling capabilities, the tourism accommodation sector still face high levels of uncertainty, challenges and possible flood hazards (Suarez *et al.,* 2005; Merz *et al.,* 2010; Hapuarachchi *et al.,* 2011; Ghaderi *et al.,* 2015; Owen *et al.,* 2016).

Long-term climate change impacts cause implications for tourist flow patterns, and tourist destinations have recently begun investigations into tourism businesses (Hamilton *et al.,* 2005; Berrittella *et al.,* 2006; Ciscar *et al.,* 2011; Rogerson, 2012; Becken, 2012; Gössling *et al.,* 2012; Day *et al.,* 2013; Amelung and Nicholls, 2014; Aylen *et al.,* 2014; Becken *et al.,* 2014; Becken *et al.,* 2015). Flooding research suggests that the effect of climate change will not be homogeneous across the globe (Gbetibouo and Hassan, 2005; Tervo, 2008). Flood theories include frameworks and practical structures to explore, identify, implement or put into practice measures to reduce the flood hazards or damages. The market-based instrument theory for floods on tourist destinations (Filatova, 2014), and the flood risk perception theory focusing on human (tourist) perceptions of the floods (Birkholz *et al.,* 2014) are theories in modeling the tourist demand and marketing of tourist destinations. None of the above-mentioned flood theories identify and explain the flooding impacts, exposure, and experiences of the tourism accommodation sector. Mustafa (2005) developed an ideal flood theory to apply to any tourism business, and to understand all the associated components. The *Flood Hazard Scope Theory* (Mustafa 2005) allows for the identification and introduction of floods as a hazard and explores the exposure, vulnerability, capabilities and measures of a tourism business during and after a

flood event. The theory includes many sub-divisions such as the hydrology, assessment, warning and forecasting of floods (Mustafa, 2002; 2005; Mustafa *et al.,* 2011) to understand major flooding issues. The theory has been revised to make it more robust in terms of practical application and understanding (Mustafa *et al.,* 2011).

New theoretical perspectives of tourism need to relate to areas of geographical interest and it has to lead to new explorations and insights of tourism studies (Lew, 2013; 2014). There remains a lack of research as to how local tourism actors in different geographical settings perceive climate change variable impacts (Wyss *et al.,* 2014). Some academics argue that the perception of any climate change related impacts on tourism need to be understood in a specific geographical context (Strickland-Munro *et al.,* 2010; Biggs *et al.,* 2014; Wyss *et al.,* 2014). Clear perspectives and rigorous arguments around flooding impacts and tourism studies can be developed with frameworks placed from a geographical aspect (Strambach and Surmeier, 2013). Figure 2.1 (below) presents the reviewed literature in light of the *Flood Hazard Scope Theory* (Mustafa, 2005) and categorises four themes within the literature: the hazard stage, the exposure stage, the vulnerability stage and the adaptation stage (Mustafa, 2005). The theoretical framework includes the exploration of the perception of tourism managers of changes in tourist demand because of flooding events. The theory further assists to explore tourist length of stay, tourism management flooding experiences, vulnerability, and adequate adaptation plans considering floods as a hazard to the sector.

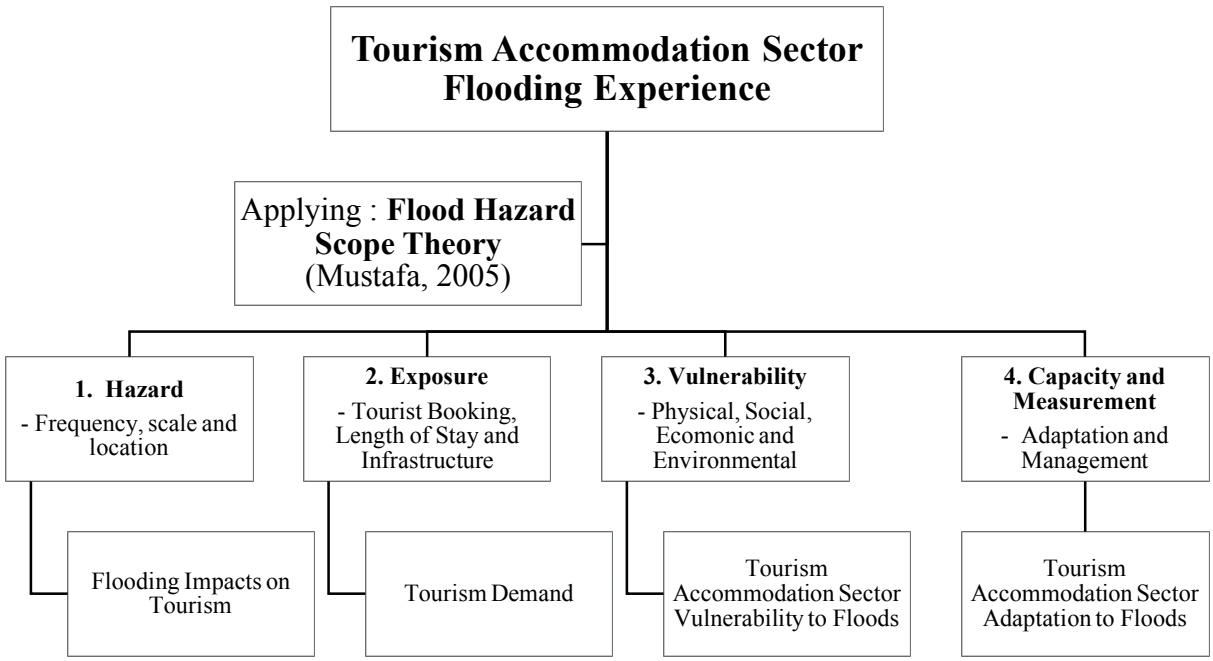

Figure 2.1: The application of the *Flood Hazard Scope Theory* adapted from (Mustafa, 2005) to explore the flooding impacts and experiences of the tourism accommodation sector. (Source: Adapted from Mustafa, 2005).

2.3. Flooding and tourism research

Identifying flooding impacts as a hazard to the tourism accommodation sector based on flooding and tourism research can aid in understanding the perceived risks. This section explores the relationship between flooding and tourism research, followed by a definition of floods and flood types. The scale, frequency, and intensity of floods are discussed to understand the nature and location of floods and why floods can be extreme. Flood investigations are included to understand the scale and frequency of floods from a global to a local setting. The local flood understanding leads to identifying floods across Africa, southern Africa, and South Africa. The section concludes with the climate factors leading to an increase in floods in some areas of South Africa.

Flooding impacts on tourism have become a substantial and pressing issue worldwide (Agnew and Viner, 2001; Jeuring and Becken, 2013; Becken *et al.,* 2015). Flooding has the capacity to generate disorder in the tourism sector, creating difficulty for small tourism business management (Laws and Prideaux, 2005; Huq *et al.,* 2007; Jarvis and Ortega, 2010; Pang *et al.,*

2012; Bernard and Cook, 2015). The new role tourism plays in flooding literature indicate that tourism vulnerability and contribution remain complicated, since tourism research is expanding to approach the impacts from a geographical background (Berrittella *et al.,* 2006; Peeters and Dubois, 2010; Jeuring and Becken 2013). Flooding has affected the geographical setting, landscape, activities and attractions of the tourism accommodation sector (Berrittella *et al.,* 2006; Brown, 2006; McEvoy *et al.,* 2008; Yu *et al.,* 2009; Becken, 2013b; Wyss *et al.,* 2014). The global tourism sector has recently been exposed to flooding in many destinations both coastal and inland (Faulkner and Vikulov, 2001; Ritchie, 2004; Suarez *et al.,* 2005; Hall, 2010; von Bergner and Lohmann, 2013). The tourist accommodation establishments experience many unusual flooding impacts, risks and outcomes (Agnew and Viner, 2001; Werritty *et al.,* 2007; Weber, 2010; Wu, 2010; Ciscar *et al.,* 2011). Tourism flood consequences allow for studies to make simultaneous changes in tourist location supply and demand (Agnew and Viner, 2001; Berrittella *et al.,* 2006; Amelung and Nicholls, 2014). The outcomes may include consequences such as a loss in business, tourist numbers, damaged infrastructure and high recovery costs (Changnon, 1998; Mondlane, 2010; Weber, 2010; Atta-ur-Rahman and Khan, 2011; Hamzah *et al.,* 2012). Flooding research demonstrates that the field has grown to include multiple dimensions of tourism as well as mitigation, adaptation and policy to be more integrative and critical on flood analyses (Becken, 2013; Espiner and Becken, 2014). Perceptions of flooding impacts are often from a local perspective based on a specific area or place, where the tourism business owners and planners understand the local environment in which they operate (Somerville, 2004; Tsai and Chen, 2011; Saarinen *et al.,* 2012; Crona *et al.,* 2013; Wyss *et al.,* 2014). Tourism has established a relationship with flooding episodes and impacts and for this reason, tourism scholars have started to focus on the perceptions of flooding impacts on tourism (Spence *et al.,* 2011; Crona *et al.,* 2013; Shani and Arad, 2014).

Floods can be defined as; "a substantial rise in water that covers areas not usually submerged with water flowing into a region faster than it can be absorbed (i.e. soaked into the soil), stored (in a lake, river, or reservoir), or removed (in runoff or a waterway) into a drainage basin" (Ackerman and Knox 2012, 373). When flooding episodes occur, water overflows the channel and spills onto the adjacent floodplains (Hunter *et al.,* 2005; Atta-ur-Rahman and Khan, 2011; Nathan, 2008; Rowberry *et al.,* 2011). Floods are classified into four categories (Asante *et al.,* 2007; APFL, 2008). First, *local floods* are common in urban built environments (small and medium sized towns) and often generates high surface run-off after heavy rainfall (Ayele *et al.,* 2006). Second, *river floods* in upstream areas are triggered by heavy rainfall where the run-

off water volume exceeds the river flow capacities and exposes low lying buildings close to the river banks (Smithers *et al.,* 2001; Jonkman, 2007; Abaya, 2008; Mondlane, 2010; Gasper *et al.,* 2011; Mekiso *et al.,* 2013; Malherbe *et al.,* 2014). Third, *flash floods* occur when the rapid accumulation of run-off water from up-stream and mountainous areas due to heavy rainfall and failure of flood control, flow downstream and cause flooding (Gruntfest and Ripps, 2000; Ayele *et al.,* 2006; Cohen, 2007; Hapuarachchi *et al.,* 2011; Faling *et al.,* 2012; Kundzewicz *et al.,* 2013; Poolman *et al.,* 2014; Bangira *et al.,* 2015). Flash floods may occur several times a year produced by heavy thunderstorms (Douglas *et al.,* 2008; Lehto *et al.,* 2008; Le Comte, 2010; Fatti and Vogel, 2011; Hapuarachchi *et al.,* 2011). Lastly, *coastal floods* occur when high ocean tides and storms caused by tropical depressions and cyclones, causing damages to urban areas located at estuaries, low-lying land along river basins and coastal areas (Zerger and Wealands, 2004; Suarez *et al.,* 2005; Scawthorn *et al.,* 2006; Cohen, 2007; Nicholls *et al.,* 2007; Awuor *et al.,* 2008; APFL, 2008; Malherbe *et al.,* 2014).

Research into the flooding impacts are limited (Gruntfest, 1995; Awuor *et al.,* 2008; Sharma and Franks, 2013; Heritage *et al.,* 2014). Flooding is the third most destructive hazard globally after earthquakes (Geipel, 1999; Mustafa, 2002; Zbigniew *et al.,* 2005; Fekete, 2009; Wilby and Keenan, 2012; Balica *et al.,* 2013). Floods can become disastrous with adverse structural and non-structural implications (Atta-ur-Rahman and Khan, 2011). Floods are in most cases caused by heavy rainfall, or the unusual movement of air pressure systems, storm surges and the failure of dams and rivers (Pettersen *et al.,* 2004; Atta-ur-Rahman and Khan 2011). Flooding has increased accompanied by strong winds and hail and rainfall-derived floods are one of the most costly natural hazards worldwide (Holmgren *et al.,* 2003; Ahern *et al.,* 2005; Huq *et al.,* 2007; Nicholls *et al.,* 2007; Knapp *et al.,* 2008; Ngubo *et al.,* 2008; Viviers and Chapman, 2008; Ranger *et al.,* 2011; Hallegatte *et al.,* 2013). Flooding events are likely to increase as temperatures rise (Hirabayashi and Kanae, 2009; Ciscar *et al.,* 2011; Kundzewicz *et al.,* 2013; Walsh *et al.,* 2013). The average global temperature scale is expected to rise between 1.4°C and 5.8°C due to climate variability (Tervo, 2008; Chandran *et al.,* 2012; Hart *et al.,* 2013; Pongkijvorasin and Chotiyaputta, 2013; Aylen *et al.,* 2014; Fitchett and Grab, 2014; Gómez-Martín *et al.,* 2014b; Rankoana, 2016). Most rain-derived floods result in flash floods, moving fast and happening abruptly with no time for warning or effective planning, and cause unexpected damage (Fatti and Vogel, 2011; Tsai and Chen, 2011; Fatti and Patel, 2013; Kruger and Douglas, 2015; Musungu *et al.,* 2016).

Globally, investigations of flooding impacts on tourism have begun to include various countries and tourist destinations (Agnew and Viner, 2001; Nicholls *et al.,* 2007; Goodess, 2012; Fatti and Patel, 2013; Schuckert *et al.,* 2015). Floods in Prague, the capital city of Czech Republic in 2002 reduced the visitor numbers by one-third with a cancellation of 30 000 reservations for national airline flights (Suarez *et al.,* 2005; Kang *et al.,* 2010; Brázdil *et al.,* 2011; Filimonau *et al.,* 2011; Maharjan, 2014). Similarly, in 2005 hurricane Katrina hit the US state of New Orleans which dramatically caused the tourism sector to halt due to floods (Ritchie, 2008; Goodess, 2012; Walters *et al.,* 2014). Hotels had been destroyed and rooms booked for new arrivals were empty followed by booking cancellations and the gravity of the crisis was reflected in the hotels' occupancy figures (Henderson, 2005; Ghaderi *et al.,* 2015). The hotel sector marketing had to be revised weeks after the floods, to increase tourist demand (Henderson, 2005). Flooding styles and types in Australia vary since a diversity of weather systems cause them. Flash floods are very common in Australia and have impacts on tourist peak flow, short warnings times and high potentials for loss of life (Yeo, 2003; Zerger and Wealands, 2004; Windle and Rolfe, 2013). The Australian tourism sector has become vulnerable to the occurrence and scale of extreme weather events, most of it being floods, landslides and storm surges (Hadwen *et al.,* 2011; Amelung and Nicholls, 2014). A number of Australian tourism developments are at risk due to the expose to floods (Yeo, 2003; Cioccio and Michael, 2007; Hadwen *et al.,* 2011; Sharma and Franks, 2013; Windle and Rolfe, 2013).

Moving to less-developed and developing countries, Mumbai (India) is prone to flooding with severe disruptions annually to the tourism sector (Henderson, 2005; Humanitarian Policy Group, 2009; Ranger *et al.,* 2011;). Mumbai's vulnerability refers to the expected tourism business property damage costs based on the flood water level (Atta-ur-Rahman and Khan, 2011; Ranger *et al.,* 2011; Looney, 2012). Mumbai experiences a flood every year during the summer months, and the worst floods occurred in 2004, 2005 and 2007 (Ranger *et al.,* 2011; Becken *et al.,* 2014). Mumbai is susceptible to floods due to its natural and human made geography and landscape (Ranger *et al.,* 2011). Mumbai is constantly exposed to heavy summer rainfall creating frequent flash floods (Ranger *et al.,* 2011). Floods in Bangladesh have become a barrier for tourism and local economic development (Shahid, 2012). Flooding studies in Bangladesh are not explored in detail, since it lacks academic literature for both tourism and flooding (Ives, 1991; Younus and Harvey, 2013; Cross and Cross, 2014). Pakistan has an historical record of flooding events, damages and losses every year (Atta-ur-Rahman

and Khan 2011; Looney, 2012). Pakistan faced the worst floods during 1929, 1955, 1959, 1973, 1976, 1988, 1992, 1996, 2005 and 2010 and these affected the tourism sector (Mustafa, 2003; 2005; Atta-ur-Rahman and Khan, 2011; Looney, 2012).

There are changes in weather patterns across Africa, throughout the western, central and eastern parts of the continent (Le Comte, 2010; Hart *et al.,* 2013; Du Plessis and Burger, 2015; Thiemig *et al.,* 2015; Van Wilgen *et al.,* 2016). Different flooding types and scales are widespread throughout Africa with heavy rainfall and high temperatures (Ekblom *et al.,* 2012; Engelbrecht *et al.,* 2013; Hart *et al.,* 2013; Heritage *et al.,* 2014; Nicholson, 2016; Nka *et al.,* 2016). In East Africa, heavy rainfall and high temperatures over the Indian Ocean has resulted in countless flooding events from 2002 onwards, affecting countries such as: Burundi, Kenya, Rwanda, Tanzania and Uganda (Awuor *et al.,* 2008; Lehto *et al.,* 2008; de Sausmarez, 2013; Becken *et al.,* 2014; Malherbe *et al.,* 2014; Nicholson, 2016). Malawi has recently been affected by disastrous floods in 2014 (Hill, 2014; Msyamboza *et al.,* 2016). Parts of southeastern Africa have experienced changes in daily, monthly and annual rainfall patterns (Le Comte, 2010; Sen Roy and Rouault, 2013; Pohl *et al.,* 2014). West Africa has experienced serious flood damages since 1995 and the flood frequency and scale is increasing, especially in Ghana (Le Comte, 2010; Godfred, 2015; Nka *et al.,* 2016) . Flooding in Nigeria has been extensively studied to understand the perception of the impacts and the adjustments to urban and rural flooding (Ayoade and Joubert, 1997; Olorunfemi, 2011; Adigun *et al.,* 2013; Dillimono and Dickinson, 2016).

Southern Africa has seen variability in temperatures and rainfall, causing localised floods in a range between 2.5mm to 500mm of rain in the southeastern parts including Botswana, Mozambique, South Africa and Zimbabwe (Dube*,* 2003; Ekblom *et al.,* 2012; Hart *et al.,* 2013; Fitchett and Grab, 2014). In 2000, the Okavango Delta flooding resulted in the closure of the Moremi Game Reserve located centrally in the Delta for eight months due to impassable transportation links (Dube, 2003; Mbaiwa and Mmopelwa, 2007; Saarinen *et al.,* 2012; Hambira and Manwa, 2013). Floods in the Okavango Delta had direct impacts on tourist numbers. Floods destroy tourism infrastructure including roads, bridges and resorts (Nyaupane and Chhetri, 2009). The worst ever floods hit Mozambique and South Africa in 2000 resulting in destruction and complications (Smithers *et al.,* 2001; Tempelhoff *et al.,* 2009b; Mondlane, 2010; Fatti and Patel, 2013; Fitchett and Grab, 2014; Maposa *et al.,* 2014a; de Groen and Robinson, 2015; Sitoe *et al.,* 2015). Floods have affected both inland and coastal areas of

Mozambique for the past ten years (Smithers *et al.,* 2001; Maposa *et al.,* 2014b; Spaliviero *et al.,* 2014).

Mozambican areas prone to floods affect business operation, the local economy, and communities (Spenceley, 2006; Sitoe *et al.,* 2015). Floods in Mozambique have put a halt to tourist activity in some parts of the country (Spenceley, 2006; Maposa *et al.,* 2014a). South Africa experiences the aftermath of storms affecting Mozambique, and floods occur in the northeastern parts of the Limpopo Province (Engelbrecht *et al.,* 2013). Both South Africa and Mozambique were affected by ex-tropical depression Dineo (Knight and Evans, 2017; SABC News, 2017). The cyclone affected Mozambique and South Africa through prolonged and heavy rainfall for almost two weeks (SABC News, 2017). All Durban north beaches were closed, due to coastal swells, and the sea swells flooded businesses, hotels, restaurants, and infrastructure alongside the coast (SABC News, 2017).

Table 2.1 (below) includes research in the field of flooding impacts and tourism businesses, particularly flooding impacts on tourist accommodation. The studies on the flooding impacts on tourist accommodation include the experienced consequences that led to implications for tourist reservations and room occupations.

Table 2.1: Previous studies done to understand the consequences of flooding impacts on tourist accommodation

Author(s)	**Study location**	**Flooding impacts on tourist accommodation**	**Consequences**
Changnon, 1998, Henderson, 2005	Mississippi	River basin flooding affecting all surrounded tourism hospitality business infrastructure.	Infrastructure rebuilding cost analysis. Navigation of major rivers – flood mitigation. Economic evaluations of flood damages.
Yeo, 2002	Australia	Damaged accommodation infrastructure (facilities, tracks and bridges).	High costs to repair and a loss of Wilderness Tourism revenue during school holidays. Reduce flood losses and adopt disaster management plans.
Chandler, 2004	New Orleans	Flooding impacts on the lodging industry (physical damages suffered and lost room revenues).	Economic impact of floods analysis on the lodges and hotel reservations cancellations.
Awuor *et al.,* 2008	Kenya	Floods damaged hotel infrastructure and halted tourism operations. Loss in contribution to economy.	Tourism hospitality businesses need measures to reduce their vulnerability to floods, because they are negatively affected.
Richins *et al.* 2009	Florida	Floods, droughts, heat waves, hurricanes and tornados impacts tourism industry badly – decreased tourism operations.	Tourism industry understanding of flooding and its impacts, to measure the intensity and to create warning systems.
Pham *et al.,* 2010	Global	Flood economic impacts on tourism planning for the hotel industry.	Loss in tourist numbers and interests. Business halted. Time and costs too much to recover.
Tsai and Chen, 2011	Taiwan	Typhoon and flood risk impacts on hotel industry in the Hualien area. Damaged hotel infrastructure.	Hotel vulnerability, a loss of business and tourists. Climate and industry insurance and hotel damage protection.
Hamzah *et al.,* 2012	Malaysia	Flood disaster and impacts on tourism providers' infrastructure (hotels, lodges and B&B's).	Decline in tourist numbers, cancellation of tours, disruption of nature tourism, losses to tourism services.
Mbaiwa and Mmopelwa, 2013	Botswana	No access through roads and tourism facilities. Turnover takes a downturn due to flooding patterns. Tourists fear diseases and/or being injured or killed by the floods and cancel their bookings.	Lodge managers/tour operator's perceptions on how their tourism operations and outputs would be affected by changes in flooding needs understanding. Adaptation need to the changing flooding patterns due to climate change.
Bernard and Cook, 2014	Fiji	Flood risks on luxury tourism accommodation (floods damage accommodation infrastructure).	Global visitor number drops affecting 10% of day trippers. Luxury tourism accommodation has to deal with recovery costs leading to investments on flood risks.

Mair *et al.,* 2014	Global	Weather related events (floods and hurricanes) impacts on tourism destinations – damage to infrastructure and resources.	Changes in tourist behaviour, tourist numbers drop due to fear and dangers of floods.
Ghaderi *et al.,* 2014	Thailand	Effects of floods on tourism hospitality industry; damaged infrastructure and a drop in business.	Tourist demand drops and the choosing of other destinations advised by tour operators/ travel agents. Cancellations and postponement of trips due to flooding. Travel to Thailand seen as a warning.
Fitchett *et al.,* 2016	South Africa	Measuring of economic costs of flooding impacts on tourism.	Tourist accommodation establishments experience a loss in bookings, profit and business. The recovery cost become too high and cannot to settled by the establishment, and compensation/investments are required

Climate change in South Africa has increased temperature and heavier rainfall throughout the country, leading to an increase in flooding events and severe drought (Maponya, 2012; Garland, 2014; Poolman *et al.,* 2014; Daron, 2015; Du Plessis and Burger, 2015). Flooding exposes South Africa to many risks and challenges (Fatti and Vogel, 2011). Changes in weather influences the flood frequency in South Africa, decreasing the return rates from a 100 year period to between six and ten years (Smithers *et al.,* 2001; Ranger *et al.,* 2011; Engelbrecht *et al.,* 2013). The Centre for Research on the Epidemiology of Disasters (CRED) analysed flood disasters across South Africa between the years 1900 and 2014 and confirm that floods are the most hazardous (Poolman *et al.,* 2014; Botai *et al.,* 2015; Manhique *et al.,* 2015). Floods in the country have increased by 34% since 2009 resulting in significant impacts on society and infrastructure (Engelbrecht *et al.,* 2013; Kundzewicz *et al.,* 2013; CRED, 2014; Rankoana, 2016).

A total of 184 flood events occurred over South Africa during the years 1911 to 1988 (SAWB, 1991; Smithers *et al.,* 2001; Mondlane, 2010; Komen *et al.,* 2015). Aside from the Limpopo Province, Mpumalanga and KwaZulu-Natal which frequently experience floods. Mpumalanga, experienced flood losses and consequences in the Kruger National Park and surrounds (Parsons *et al.,* 2005; Reason *et al.,* 2005; Heritage *et al.,* 2014). Flooded towns and areas in Mpumalanga include Sabie, White River, Hazyview, Bushbuckridge and the Kruger National Park (Parsons *et al.,* 2005; Heritage *et al.,* 2014; Fitchett *et al.,* 2016; Knight and Evans, 2017). KwaZulu-Natal has experienced an increase of 30% of flood events since 2009 (Conelius *et al.,* 2009; Cartwright *et al.,* 2013; Walsh *et al.,* 2013). Limpopo, Mpumalanga, North West

and Gauteng experienced 42% of the local flash floods since 2010 (Botai *et al.,* 2015; De Groen and Robinson, 2015). North West and Gauteng started experiencing severe flash floods since 2011 (Dyson, 2009; Nikodinoska *et al.,* 2014). Table 2.2 (below) provides a summary of flood events between the years 2000 and 2017 that cost the South African economy.

Table 2.2: A summary of South African Provinces prone to flooding events during the summer months over the period 2000-2017

South African Province	**Years**	**Damages & Impacts**	**Responses**	**Costs in ZAR**
North West	2017 2015 2014 2011	Flooded houses and buildings Flooded roads Displacement	Disaster management Repairs	R6 million
Gauteng	2017 2016 2015 2014 2011	Damages to roads Trapped vehicles Flooded highways	Disaster relief Disaster management protocol Impact assessment	R124 million
KwaZulu-Natal	2017 2014 2011	Damages to roads Fatalities Drowning Collapsed walls	Quantification of damages Monitor to minimise	R300 million
Mpumalanga	2017 2014 2013 2012 2005 2000 2001	Damaged buildings Collapsed homes Injuries and drowning Blocked drainage systems Tropical depression Dando Damaged roads	Search and rescue missions Airlifting Early warning systems	

Limpopo	2017 2016 2014 2013 2012 2011 2009 2006 2000	Affected local communities Infrastructure and household damage Injuries, drowning and evacuations Displacements Fatalities Business loss	Relief efforts Disaster zone Food parcels Airlifting Early warning systems	R27 million

(Source: Adapted from City Press, Mail & Guardian, News24 Online, SABC Online, and SAPA, Summer-Autumn 2014-2017).

Flood risks increase in the midst of development that leads to the absence of effective spatial flood planning (Smithers *et al.,* 2001; Ranger *et al.,* 2011; Klijn *et al.,* 2015). During floods, planners take the environmental and socio-cultural matters into account to help conceptualise the event to work with local communities (Crona *et al.,* 2013; Fatti and Patel, 2013). Flood planning and development decisions are challenging, since the magnitude, vulnerability and impacts of future floods are not known (Brody *et al.,* 2007; Hapuarachchi *et al.,* 2011; Guinea *et al.,* 2015).

2.4. The perceived direct and indirect flooding impacts on the tourism accommodation sector

The perceptions of flooding impacts have taken on different classifications and evaluations. Determining the flooding impacts on tourism accommodation establishments is a complex process (Becken *et al.,* 2014). The tourism accommodation sector categorises flooding impacts into direct and indirect impacts, based on the perception of accommodation owners, stakeholders, and investors. This section will explore the perceived common direct and indirect flooding impacts on the tourism accommodation sector, including different types and examples.

2.4.1. Direct flooding impacts

Direct flooding impacts are the damages to the physical aspects of the tourism business (Merz *et al.,* 2010; Ranger *et al.,* 2011; Sharma and Franks, 2013). The direct flooding impacts can be referred to as the physical operations of a tourism business (Faulkner, 2001; Faulkner and Vikulov, 2001; Park and Reisinger, 2010; Ciscar *et al.,* 2011) . The hardware includes the physical components of the business such as the building, facilities and the infrastructure (Chandler, 2004; Laws and Prideaux, 2005; Xu and Grunewald, 2009; Park and Reisinger, 2010; Pang *et al.,* 2012b; Bernard and Cook, 2015). The perceived direct flooding impacts on tourist accommodation include:

- A direct destruction to property, infrastructure and the environment
- An immediate drop in tourist demand, reservations and length of stay
- A direct loss in profits, the economy and accommodation competitiveness

Tourism accommodation businesses have experienced destruction to the property, facilities, infrastructures, and environments they operate in (Filimonau *et al.,* 2011; Su *et al.,* 2012; Fitchett *et al.,* 2016). The accommodation property includes both outdoor and indoor facilities. The outdoor accommodation facilities include outdoor camping facilities, abolition facilities, outdoor walking, seating and fireplaces, swimming pools, entertainment and play facilities (Jeuring and Becken, 2013; Aylen *et al.,* 2014; Mycoo, 2014). The indoor accommodation facilities include the rooms, reception, restaurants, dining halls, bars and waiting areas (Amelung and Nicholls, 2014). Floods affect these areas with floodwaters entering into the building through doors and windows. The accommodation infrastructure includes the connected roads, bridges, parking's, drive, and walkways for tourist transportation (Scawthorn *et al.,* 2006; Gössling *et al.,* 2012; Mycoo, 2014). The environment in which the accommodation business operates in, includes the natural fauna and flora, the game reserve, springs and soils (Becken, 2005; Filimonau *et al.,* 2011; Su *et al.,* 2012). These natural elements of the environment are impacted directly during floods, destroying the fauna and flora, forcing wildlife to migrate and offloading flood debris and sediments (Gbetibouo and Hassan, 2005; Eze *et al.,* 2016).

Direct flooding impacts on tourist demand, and reservations lead to a drop in business for the accommodation sector (Moore, 2010; Faasen, 2014). Flooding has the potential to alter the accommodation, destination and seasonal demand patterns (Ciscar *et al.,* 2011; Gössling *et al.,* 2012; Ridderstaat *et al.,* 2014). Many tourist destinations and accommodation establishments experience changes in annual tourist demand resulting in issues with their infrastructural planning during peak times and revenue losses during off-peak times (Yu *et al.,* 2009; Becken, 2013b; Falk, 2014; Becken *et al.,* 2015). Accommodation establishments affected by floods fall behind through cancelations and postponements of trips, until it is safe to visit and the area has fully recovered (Nilsson and Gössling, 2013; Zahed *et al.,* 2014). Direct flooding impacts are likely to move tourism businesses tourist activities to higher altitudes and latitudes, to avoid future flood risks (Lepp and Gibson, 2008; Gasper *et al.,* 2011; Steyn and Spencer, 2012; Saarinen and Rogerson, 2013). The tourist length of stay at an accommodation type is mainly relative to the type of stay (Gössling *et al.,* 2012; Aylen *et al.,* 2014; Gómez-Martín *et al.,* 2014a; Kruger and Saayman, 2014). Climatic information available to the tourism accommodation sector will assist in determining the length of a tourist season and the tourist length of stay at a destination annually (Goh, 2012; Becken and Wilson, 2013; Amelung and Nicholls, 2014).

Floods lead to a direct loss of accommodation profits, contributions to the local economy and implications with market competitiveness. Tourist length of stay and the profitability of the accommodation sector are considerably influenced by flooding episodes (Chiesa, 2009; Yu *et al.,* 2009; Rogerson and Sims, 2012; Kruger and Saayman, 2014). Direct flooding impacts affect the tourist expenditure and the quality of local resources (Berrittella *et al.,* 2006; Moore, 2010; Gasper *et al.,* 2011; Mbedzi, 2011). Flooding can affect the competitiveness of tourist regions and operating accommodation businesses (Bigano *et al.,* 2006; Bigano *et al.,* 2007; Saarinen *et al.,* 2012; Rogerson, 2013a; Rossell and Santana-Gallego, 2014). The competitiveness of tourist accommodation establishments creates implications for planning, marketing, and development in the operating region. Flooding affects the environmental context where tourist accommodation businesses operate and influences regional economic contribution and development (Guizzardi and Bernini, 2012; Steyn and Spencer, 2012; Rogerson and Visser, 2014). Increased direct flooding impacts on infrastructure deteriorates the tourism economic settings (Steyn and Spencer, 2012; Bernard and Cook, 2015;). Flooding has direct impacts on accommodation operation and insurance costs (Ranger *et al.,* 2011; Tsai *et al.,* 2013; Garland, 2014). Direct economic flooding impacts have the likelihood of

decreasing the regional and provincial contribution to the gross domestic product (GDP) (Van Der Veen and Logtmeijer, 2005; Nicholls *et al.,* 2007; Ciscar *et al.,* 2011; Ranger *et al.,* 2011; Birkholz *et al.,* 2014).

2.4.2. Indirect flooding impacts

Indirect flooding impacts are related to direct impacts and occur at a different time or place outside of the flood event (Jonkman *et al.,* 2008; Merz *et al.,* 2010; Ranger *et al.,* 2011). Indirect flooding impacts the social and cultural dimensions of direct flooding impacts, that include society and their behaviour (Benjamin, 2008; Stylidis *et al.,* 2014). Indirect flooding impacts in most cases include the decision making process (Walmsley, 2008; Jeuring and Becken, 2013; Meteorological Society, 2016). Indirect flooding impacts are a diffusion of direct flooding impacts and include the consequences of the flood aftermath. Indirect flooding impacts are the intangible elements of any flood damages and destructions to property, buildings, and infrastructure of a tourism business (Cochrane, 2004; Law *et al.,* 2012). Indirect flooding impacts are more complex to identify and classify. The perceived indirect flooding impacts on tourist accommodation include:

- An indirect impact on repeat or return visits, tourist experiences and the decision-making process of both the tourists and tourist accommodation management
- An indirect impact on the loss of products and services, promotions and media
- An indirect impact on the local community, employment and accommodation staff

Indirect flooding impacts on return visits shift the tourist destination focus and threaten the current tourist activity after floods (Weber, 2010; Hübner and Gössling, 2012; de Sausmarez, 2013; Espiner and Becken, 2014). Repeat tourists require information on possible weather scenarios (Goh, 2012; De Urioste-Stone *et al.,* 2015). Indirect flooding impacts can affect tourist satisfaction and tourists can become negative towards tourist destinations and experiences (Conelius *et al.,* 2009; Hübner and Gössling, 2012; Becken and Wilson, 2013; Michalkó *et al.,* 2015). Tourists discriminate more as they become aware of the flooding impacts on the quality of their recreational experiences and may result in lower tourist

satisfaction (de Freitas, 2003; Pang *et al.,* 2012b; Dubois *et al.,* 2016). Tourist experiences at any tourist destination or accommodation is of extreme importance for product development, relationships and reviews, loyalty programs and marketing (Mura, 2010; Michalkó *et al.,* 2015). Tourist experiences determine return visits, decision-making, and length of stay. If the experiences are positive, tourists will talk about it and return, but if tourists have negative experiences they will not return. Tourist experiences during and after flood events are normally negative, since their holidays are indirectly impacted by floods and they have to end it (Kundzewicz *et al.,* 2013). Tourist accommodation management decisions during and after floods events are complex and they are costly managerial tasks to undertake (Ranger *et al.,* 2011; Sayers *et al.,* 2013).

The indirect flooding impacts on the loss of products and services of those not consumed during and after floods leads to supply consequences for the accommodation business. Tourist accommodation businesses prepare specialised products and services for tourists who booked long in advance (e.g. wildlife safari tours, cultural tours), but in an event of floods these products and services are not available (Berrittella *et al.,* 2006; Rogerson and Rogerson, 2014; Schuckert *et al.,* 2015). Flood indirectly impact products including tourist activities, packages, and day tours (Pang *et al.,* 2012; Nikodinoska *et al.,* 2014). Floods indirectly impacts the services that include events or shows, pleasantness and quality service (Day *et al.,* 2013; de Kumar, 2015). The lost products and services are the supply fundamentals of the tourist accommodation business. Floods indirectly impact the supply of tourist accommodation (Dwyer *et al.,* 2009; Guizzardi and Bernini, 2012; Rogerson and Rogerson, 2014). Accommodation promotions during and after floods are indirectly impacted, since they are of no use and interest if the news already reached the tourists (Filimonau et al. 2011). Accommodation promotions include lower rates and packages for interested tourists during peak and off-peak season (Amelung *et al.,* 2007; Yu *et al.,* 2009; Falk, 2014; Kruger and Douglas, 2015). Online and social media may provide tourists with flooding information. Extensive media coverage on the flooding events are good to provide information, but influence tourist travel plans and perceptions of the flooded area (Lehto *et al.,* 2008; Gómez-Martín *et al.,* 2014b). Different mediums of communication can be either negative or positive and that can influence tourist travel plans.

The indirect flooding impacts on the local community include socio cultural- and economic factors. Flood impacts on local communities include flood damage to homes, transportation

services and links, and the spread of diseases. Issues with water and electricity supply, telecommunications, sewage and waste management arise, that indirectly impact nearby tourist accommodation businesses (Shahid, 2012; Mycoo, 2014). Floodwaters transport waste and affects ground water and other fresh water streams leading to the accommodation (Cullis *et al.,* 2011; Vijayavenkataraman *et al.,* 2012). Local residents may be stuck in floodwaters unable to get to work. As a result, accommodation businesses experience staff shortages during peak seasons when floods occur (Henderson, 2005; Sainsbury and Weston, 2010). Table 2.3 (below) presents the classification of direct and indirect flooding impacts into tangible and intangible impacts depending on the level of impact (Asante *et al.,* 2007; Merz *et al.,* 2010). Tangible flooding impacts include the damages to human capital or resources and intangible flooding impacts include the non-tradable aspects (Cochrane, 2004; Merz *et al.,* 2010).

Table 2.3: The classification of flooding impacts into direct, indirect, tangible and intangible impacts

Direct tangible flooding impacts on:	**Direct intangible flooding impacts on:**	**Indirect tangible flooding impacts on:**	**Direct intangible flooding impacts on:**
Buildings, property and contents	Loss of life and injuries Psychological distress	Disruption of public services	Trauma
Infrastructure; roads, railroads	Damage to cultural heritage	Induced production losses	Loss of trust in authorities
Evacuation and rescue measures	Negative impacts in ecosystems	Cost of traffic disruption	
Business interruption		Loss of tax revenue	

(Source: Adapted from: Merz *et al.,* 2010).

Future flood predictions have become a challenge, especially linking direct and indirect flooding impacts to economic processes (Hein *et al.,* 2009; Kundzewicz *et al.,* 2013; Sitoe *et al.,* 2015). The perceptions of flooding impacts have led to the importance of planning. Tourist demand, activities, length of stay and accommodation facilities have become a level of impact assessment (Ranger *et al.,* 2011; Ciscar *et al.,* 2011; Balica *et al.,* 2013). Addressing accommodation management perceptions and interpretations are important to prepare for the different types of responses, resilience and recovery (Lepp and Gibson, 2008; Kellens *et al.,* 2013; Birkholz *et al.,* 2014; Rankoana, 2016). Tourist accommodation responses will be different based on the different type of accommodation service and location (Coates, 2010;

Kang *et al.,* 2010). Flooding impact assessments depends on the spatial and temporal boundaries of any study or exploration (Merz *et al.,* 2010).

To conclude, direct and indirect flooding impacts can be negative for developments taking place alongside waterbodies, affecting the attractiveness, and, tranquility of the resorts (Yeo, 2003; Song *et al.,* 2012; Bernard and Cook, 2015; Yazdanpanah *et al.,* 2016). The environmental tax can be reduced through planning, policies, regulations and well-practiced evacuation plans (Yeo, 2003; Peeters and Landros, 2012; Vijayavenkataraman *et al.,* 2012; Birkholz *et al.,* 2014; Filatova, 2014). The perceptions of flooding impacts on tourism operation and tourist accommodation establishments in South Africa need to be explored in the light of projected flooding impacts (Filimonau *et al.,* 2011).

2.5. Tourism exposure to floods through tourism demand: Defining tourism, tourism demand and the tourism accommodation sector

The tourism accommodation sector's exposure to floods can be understood through defining tourism and tourism demand. For the past four decades, the global tourism industry has become progressively competitive and has become more accessible with a great number of consumers (Agnew and Viner, 2001; Pang *et al.,* 2012; von Bergner and Lohmann, 2013; Shani and Arad, 2014; Giampiccoli *et al.,* 2015; Hoogendoorn and Rogerson, 2015; Hambira *et al.,* 2016). International tourism has proved over the past decade to have positive impacts on the increase on long-term economic growth through different platforms (Saarinen *et al.,* 2011; Schubert *et al.,* 2011; Pang *et al.,* 2012; Day *et al.,* 2013; Hall *et al.,* 2013; Rogerson and Mthombeni, 2015; Michailidou *et al.,* 2016). Due to the tourism growth, many tourist destinations have emerged and developed, increasing economic opportunities worldwide (Gössling *et al.,* 2010; Coshall and Charlesworth, 2011; Schubert *et al.,* 2011; Peeters and Landros, 2012; Rogerson and Mthombeni, 2015; Hoogendoorn and Fitchett, 2017). Being the world's largest foreign exchange earner, tourism contributes a significant amount to growth for many countries' economies (Saarinen *et al.,* 2011; Schubert *et al.,* 2011; Smeral, 2012; Rogerson, 2013b; Bernard and Cook, 2015; Hoogendoorn and Rogerson, 2015; Köberl *et al.,* 2016). Tourism makes use of tourists traveling across different boundaries to exchange and strengthen currencies and expenditure. Tourism is a global investor, economic stimulator, employer that allows for the positive exploitation and impacts on communities (Hall, 2010; Schubert *et al.,*

2011; Rogerson, 2013; Kietäväinen and Tuulentie, 2013; Nilsson and Gössling, 2013; Bernard and Cook, 2015).

Projections show that tourism contributes approximately 9% to global production and employs more than 220 million people across the globe (Saarinen *et al.,* 2011; Day *et al.,* 2013; Rogerson, 2013; Strambach and Surmeier, 2013; Bernard and Cook, 2015; Köberl *et al.,* 2016). The tourism industry is gaining global importance with local economic development opportunities to ensure long term developmental potential (Rogerson, 2012, 2013; Becken and Hughey, 2013; Becken and Wilson, 2013; Bernard and Cook, 2015). In addition, tourism stimulates investment, through new infrastructure and tourism property development to increase the competition between different tourist countries and destinations (Coshall and Charlesworth, 2011; Sharma and Franks, 2013; Amelung and Nicholls, 2014; Bernard and Cook, 2015). Positive impacts from tourism in peripheral regions are demonstrated through socio-economic development, welfare improvements and employment opportunities (Telfer, 2002; Saarinen *et al.,* 2011; Rogerson, 2012; Becken, 2013a; Brouder, 2013; Stylidis *et al.,* 2014; Hambira *et al.,* 2016).

2.5.1. Tourism

The United Nations World Tourism Organisation (UNWTO) (2008) defines tourism as the activity of people travelling to a tourist destination, away from his/her normal home/origin environment, for less than a year and more than a day and engaging in tourist activities, facilities, products and services (Ritchie, 2004; UNWTO, 2008; Guizzardi and Bernini, 2012; Huebner, 2012; Saarinen and Rogerson, 2013; Fodness, 2016). The globally accepted definition of tourism makes reference to tourism demand and the length of stay at destinations and it is measured through accommodation production and statistics (Guizzardi and Bernini, 2012; Huebner, 2012; Rogerson and Visser, 2014). In addition, tourism may involve traveling to new, undisturbed natural settings to relax, learn or experience new places (Scott, 2011; Tsai and Chen, 2011; Boonzaaier, 2012; Biggs *et al.,* 2014). Tourist activity is manifested through the demand and supply of products and services (Dwyer *et al.,* 2009; Song *et al.,* 2012; Becken, 2013b; Rogerson and Rogerson, 2014). Tourism is described as the temporary movement of persons to different destinations not similar to their work and home spaces (Björk and Kauppinen-Räisänen, 2012; Olya and Alipour, 2015).

Tourism is understood differently in different regions and languages. The noun tourism was first used in 1811 and the noun 'tourist' during the 1840s (Tsai and Chen, 2011; Chand, 2015). Understanding the tourist activity has become a challenging task, since it has economic characteristics and values. The term 'tourism' is composed of two words- 'tour' and suffix 'ism', the word tour is derived from the Greek "tornos", meaning "a circle". It is the movement around a central point, "ism" is defined as the action of movement around a circle, i.e. the act of leaving and then returning to the original starting point (Michailidou *et al.,* 2016). Tourism is a complex interlinked sector where tourist activity is facilitated by tourism demand (de Freitas and Marmaras, 2001; Becken and Wilson, 2013; Peng *et al.,* 2015). The tourism product consists of a variety of goods and services provided by different tourism sectors and thus making it a complex diversified product (Schubert *et al.,* 2011; Song *et al.,* 2012; Rogerson and Rogerson, 2014; Peng *et al.,* 2015). Tourism is an important socio-economic activity that promotes national integration and international understanding (Hall *et al.,* 2013; Biggs *et al.,* 2014). The tourism industry includes both macro- and microeconomic tools for international and national sustainable developments and destination competitiveness (Mbedzi, 2011; Song *et al.,* 2012; Rogerson, 2013a; Lyon, 2013). The tourism industry depends on tourism demand to grow as a socio-economic activity.

2.5.2. Tourism demand

The majority of tourism demand literature include economic theories that focus on both the behavioural and consumption theory of tourists (Hamilton *et al.,* 2005; Schubert *et al.,* 2011; Strambach and Surmeier, 2013; Dillimono and Dickinson, 2016). Tourism demand is calculated by the number of tourist arrivals, the tourist expenditure level and the number of bed nights (Hein *et al.,* 2009; Song *et al.,* 2012; Kruger and Saayman, 2014; Rogerson and Rogerson, 2014; Peng *et al.,* 2015). The demand is a total number of tourists interested in a specific product for consumption (Schubert *et al.,* 2011; Smeral, 2012; Falk, 2014). Tourist flow has proved to be the most researched component of tourism economic research resulting in new developments of interest, theoretical frameworks and advanced methods (Berrittella *et al.,* 2006; Goh, 2012; Song *et al.,* 2012; Becken, 2013a; Becken *et al.,* 2015). The international and national consumption of tourism resources contribute to the socio-economic significance of tourist destinations (Song *et al.,* 2012; Stylidis *et al.,* 2014). Current tourism demand models include repeat visits, recommendations, timed decision implementations, information access,

the supply firmness and the long term tourism demand changes for tourist destinations (Hein *et al.,* 2009; Moore, 2010; Smeral, 2012; Song *et al.,* 2012; Becken, 2013b; Becken *et al.,*2015). Seasonal patterns present how sensitive the tourism sector is to weather events based on tourist and destination decisions (de Freitas, 2003; Bigano *et al.,* 2006; Kundzewicz *et al.,* 2008; Yu *et al.,* 2009; Hadwen *et al.,* 2011; Matzarakis, 2014; Ridderstaat *et al.,* 2014; Hall *et al.,* 2015). Other ways to analyse demand models include exploring the push and pull factors of tourist flows to a destination, including climate variables, facilities, setting, distance and travel costs (Rittichainuwat, 2007; Hein *et al.,* 2009; Ridderstaat *et al.,* 2014). Traditional economic theories rationalise and rank tourism products to match different ranked tourist preferences (Huebner 2012; Goh 2012). Tourism demand allows for the successful tourism resource volume forecasting to assist with the efficient managerial decision making (Goh, 2012; Hall *et al.,* 2013; De Urioste-Stone *et al.,* 2015). Despite the economic theories paired with tourism demand, attention is not given to non-economic factors (Goh, 2012; Falk, 2014; Stylidis *et al.,* 2014). Tourist accommodation serves as a good measure to determine and calculate tourism demand and other non-economic factors.

2.5.3. Tourism accommodation

Tourist accommodation is the temporary housing or place to stay with tourist supporting services (Lepp and Gibson, 2008; Conelius *et al.,* 2009; Saarinen *et al.,* 2011; Rogerson, 2012, 2013; Michalkó *et al.,* 2015). The accommodation expenditure, especially overnight, is on average higher than that of other tourism businesses (Guizzardi and Bernini, 2012; Rogerson, 2013; Falk, 2014). Tourists spend more on accommodation than the actual holiday, since the duration of the trip highly depends on the total nights spent at a destination (Guizzardi and Bernini, 2012). Tourist accommodation is used by tourists to stay, rest and recover at some point after travelling to further engage in related tourist activities (Rogerson, 2013; Rogerson and Rogerson, 2014). Accommodation facilities are developing to accompany the growth of tourist resorts and areas of tourism activity, relative to the demand to visit that area (Nelwamondo, 2009; Jarvis and Ortega, 2010; Rogerson and Sims, 2012; Rogerson, 2013b; Mycoo, 2014).

The accommodation provision has changed in type and nature as the tourism sector and tourist demands changed (Becken, 2005; Nelwamondo, 2009; Faasen, 2014). Tourist accommodation has different types due to the formal or informal style of operation, the large or small size, the

type of service offered and lastly the standard or quality of the product (Nelwamondo, 2009; Jarvis and Ortega, 2010; Guizzardi and Bernini, 2012; Rogerson and Sims, 2012; Rogerson, 2013a; Rogerson and Rogerson, 2014). Tourist interest has gradually led to a heterogeneous pool of tourist accommodation services, emerging to offer different experiences from hotels, lodges, guest houses, bed & breakfasts and self-catering accommodation (Nelwamondo, 2009; Walmsley, 2011; Rogerson and Sims, 2012; Rogerson, 2013b; Kruger and Douglas, 2015). A few challenges arise in conceptualising the importance of tourism accommodation types such as the property type, the segmentation and accommodation appearance, resources and locations (Espiner and Becken, 2014; Rogerson and Visser, 2014; Hoogendoorn and Rogerson, 2015). Tourism accommodation research platforms expanded to include studies of other forms of accommodation such as backpacker hostels, timeshare accommodation and second homes (Lehto *et al.,* 2008; Su *et al.,* 2012; Rogerson and Visser, 2014; Hoogendoorn and Rogerson, 2015; Visser and Hoogendoorn, 2015).

The tourism accommodation sector provides demand statistics, since the total number of overnight stays in a single or multiple trip(s) can determine the frequency of the visit and the length of stay (Guizzardi and Bernini, 2012; Falk, 2014; Walters *et al.,* 2014). Underreported tourism accommodation statistics have become a relevant issue to national tourism legislature (Guizzardi and Bernini, 2012; Hall *et al.,* 2013). Known tourism accommodation statistics are important for the measurement and analyses of seasonal tourist demand patterns and accommodation flows at destinations and regions (Guizzardi and Bernini, 2012). Tourism demand models, *AccStat* (movement at accommodation) and *DemSurv* (planned trips and holidays) are developed through surveys for tourists hosted at accommodation (Coshall and Charlesworth, 2011; Guizzardi and Bernini, 2012; Nilsson and Gössling, 2013; Falk, 2014). Both models sample tourism demand from collective tourist destinations and regions (Guizzardi and Bernini, 2012). During the 2010 Soccer World Cup, South Africa made changes to the quality and upgrading of accommodation standards based on the different accommodation products and services (Rogerson and Sims, 2012; Rogerson, 2013a; Rogerson and Rogerson, 2014). Tourist accommodation started offering a variety of products and services (Rogerson, 2013; De Urioste-Stone *et al.,* 2015). The accommodation sector currently focuses on property investment and upgrading to keep the offerings diversified in order to contribute to the local economy (Rogerson and Sims, 2012; Rogerson, 2013a; Rogerson and Rogerson, 2014).

The accommodation sector has the highest local ownership with 82% control over accommodation businesses (Spenceley, 2008; Rogerson, 2013b; Bernard and Cook, 2015). The global tourist industry receives high incomes from the accommodation sector (Nelwamondo, 2009; Bernard and Cook, 2015). South African tourism agencies analyses the national accommodation sector to determine the necessary development and reconstruction plans (Rogerson, 2012). Previously over the years 1990 to 2010, the importance, location, and contribution of the national tourism accommodation sector was analysed to be included in the local economic development plans (Rogerson, 2013; Mycoo, 2014; Rogerson and Rogerson, 2014). Tourist accommodation forms an essential part of the overall tourism infrastructure and are important support facilities in tourist regions (Nelwamondo, 2009; Mbedzi, 2011; Rogerson, 2013a; Amelung and Nicholls, 2014). More tourism destinations are developing due to the expansion of urban tourism and the growth of the accommodation hotel sector (Rogerson and Sims, 2012; Rogerson, 2013b; Rogerson and Rogerson, 2014). Many tourist attractions, regions, and towns prone to flooding impacts are trying to understand their vulnerability and resilience in the tourism system (Hall *et al.,* 2013; Becken *et al.,* 2014; Doiron and Weissenberger, 2014).

2.6. Tourism accommodation sector's vulnerability to floods

The tourism accommodation sector faces many challenges with flood vulnerability. The challenges include identifying the flood vulnerability elements, analyses, risks and the common flood vulnerability factors the sector faces. Tourism accommodation businesses under threat are often characterised as either vulnerable or exposed to floods (De Urioste-Stone *et al.,* 2015; Ghaderi *et al.,* 2015). Tourism accommodation businesses can either be so vulnerable that the floods directly and indirectly affect the business or robust enough through management plans. A distinction on a proactive or reactive approaches are made, to demonstrate accommodation business vulnerability or robustness (Ritchie, 2008; de Sausmarez, 2013; Amelung and Nicholls, 2014; Walters *et al.,* 2014). Vulnerability is an important aspect of adaptation at any level, and enables the preparedness of a system to cope with climate change (Espiner and Becken, 2014; Kaján and Saarinen, 2013). Flood vulnerability is the extent to which an area, business or system is susceptible to floods through their close proximity, abilities to cope, recover and adapt to any harm (Balica, 2012; Balica *et al.,* 2013; Espiner and Becken, 2014). When operations are vulnerable, it becomes challenging to adapt, since the vulnerable points

are in order to take adaptation measures (Kaján and Saarinen, 2013). Thus, the different dimensions of vulnerability should be identified to overcome adaptation process challenges. Vulnerabilities are mapped to better understand the hazard perceptions (Balica *et al.,* 2013; Tsai *et al.,* 2013). Fussel (2007) has identified four broad dimensions of vulnerability that includes the system, the quality of concern, the risk, and the temporal reference. The vulnerability factors include the exposure, susceptibility, and resilience to flooding impacts, and addresses the actual flooding episode to understand why certain elements are affected (Balica *et al.,* 2013). Flood protection systems need to be monitored, assessed, and evaluated beforehand to identify vulnerable locations (Gouldby *et al.,* 2010).

The literature on flooding impacts and vulnerability frameworks have begun to include common sources of exposure, responses and preparedness of tourist accommodation businesses (Werritty *et al.,* 2007; Gasper *et al.,* 2011; Becken *et al.,* 2014). Accommodation flood vulnerability can be analysed through various adaptation measures, mechanisms and long-term plans to handle adaptation challenges (Kaján and Saarinen, 2013; Becken *et al.,* 2014). If policy makers, businesses, and planners understand the drivers of the increased flooding vulnerability, more adequate adaptation plans can reduce future flooding impacts (Nicholls *et al.,* 2007; Kundzewicz *et al.,* 2013). Flood vulnerability studies utilise methods to cover concepts called factors of vulnerability (Balica *et al.,* 2013). Flooding impact responses can focus on the vulnerability of the region and link it to the residual risks and protection measures (Nicholls *et al.,* 2007; Honert and McAneney, 2011). The flooding impacts, the changing behaviour, planning policies and infrastructure to protect against flooding are crucial factors to create better understanding of the vulnerability risks (Becken *et al.,* 2014; Westra *et al.,* 2014). Social relations play a key role in areas of vulnerabilities, since various structures and processes influences the local community (Olorunfemi, 2011; Mustafa *et al.,* 2011; Hewitt, 2013).

The flood vulnerability of tourism accommodation businesses depend on identifying and managing risks to eliminate or reduce the impacts (Thomas *et al.,* 2011; Shaw *et al.,* 2012). Kerzner (2001) repeats that risk monitoring and management is not that challenging, the chief problem is applying the correct techniques and plans to solve the risks and the negative impacts. Decision-making is a key process for flood vulnerability, flood risk mapping, and financial appraisals during and immediately after floods (Merz *et al.,* 2010; Huebner, 2012; Michailidou *et al.,* 2016). Flood vulnerability includes all elements of an area, community, building, or

business at risk in flood-prone areas (Merz *et al.,* 2010). Tourism lacks planning, development, and management in perceived unsafe areas (Park and Reisinger, 2010; Bangira *et al.,* 2015). Floods are impact-based and adaptation assessment includes characterising levels of vulnerability and possible sensitivities in the future (Cater *et al.,* 2010; Becken, 2012; Fatti and Patel, 2013).

The accommodation sector lacks understanding of their vulnerability to flood risks (Shaw *et al.,* 2012; Mycoo, 2014). Fixed assets, lower tourist interest and bookings, and the occupation of bed-nights make the sector vulnerable to flooding impacts, since floods will directly influence the sector profits, management, and employment (Su *et al.,* 2012; Kruger and Saayman, 2014). The South African tourism accommodation sector offers different types of accommodation and all types directly or indirectly affected by floods. Tourist accommodation areas include lodges, caravan and camping parks built in and around floodplains that may increase the flood risk (Conelius *et al.,* 2009; Kruger and Saayman, 2014). Tourist safety and physical security are at the forefront of planning and development for tourist destinations (Mura, 2010; Park and Reisinger, 2010; Wilby and Keenan, 2012). The tourism businesses assets are at high risk once floods are experienced and they become vulnerable to diversity (McEvoy *et al.,* 2008; Scott, 2011; Olya and Alipour, 2015). Tourism crises, risk and prevention studies have influenced tourism researchers, professionals and managers to focus on the sectors' vulnerability and create flood awareness (Steene, 2005; Jeuring and Becken, 2013). The vulnerability of tourist accommodation to floods can affect the spatial and temporal seasonal booking pattern (Amelung *et al.,* 2007; Kaján and Saarinen, 2013; Sayers *et al.,* 2013). Strategic decision-making can help manage the sector's growth and possible adaptation challenges (Kaján and Saarinen, 2013). Flooding impacts on tourism have provoked a growing need to explore the sector's vulnerability through their abilities to adapt (Fekete, 2009; Verd, 2010; Olorunfemi, 2011).

2.7. The capacity and measures of the tourism accommodation sector through flood management and adaptation

The capacity and measures of the tourism accommodation sector is understood through the management and adaptation plans the sector implements to respond to flooding impacts. Tourism managers might face challenges in planning for the management and adaptation

process, since it relates to the quantification of the flooding impacts to extract the maximum benefits (Ranger *et al.,* 2011; Thomas *et al.,* 2011; Walsh *et al.,* 2013). Flooding impacts can be successfully managed to fully understand the drivers of the impacts and to have relevant adaptation strategies and policy options (Nicholls *et al.,* 2007; Klijn *et al.,* 2015; Hoogendoorn and Fitchett, 2016). Flooding adaptation assessment both qualifies and quantifies all possible impacts and identifies adequate adaptation plans to evaluate all possible benefits (Ciscar *et al.,* 2011; Wilby and Keenan, 2012). Tourism business management do not think about the longer term impacts of flooding and the influence it can have on the destination marketing, contingency planning and adaptation (Fatti and Patel, 2013; Walters *et al.,* 2014; Guinea *et al.,* 2015; Klijn *et al.,* 2015). Knowing the costs floods have caused will allow management to capture the full economic benefits of adaptation for the business. Flooding management and adaptation will help reduce future flooding risks (Ranger *et al.,* 2011). The section will explore the adaptation of the tourist accommodation sector to flood through considering their adaptive capacity. Tourism accommodation studies on policies, decision-making, and disaster planning assist in exploring the flood adaptation measures in South Africa.

2.7.1. The tourism accommodation sector: flood adaptation

Adaptation is the capacity of a tourism business to alter its systems, operation, structure, and management to endure any threatening changes to the business' existence, location, and success (Cartwright *et al.,* 2013; Kaján and Saarinen, 2013; Wyss *et al.,* 2014). Tourism adaptive capacity includes the conceptualisation of sectors, systems and networks to gain knowledge, experience, creative and flexible risk-evaluation, decision-making and problem solving skills (Becken, 2013; Fatti and Patel, 2013; Kaján and Saarinen, 2013; Mycoo, 2014; Woodward *et al.,* 2014). Flood adaptation planning involves a broader spectrum of flooding impacts for assessment. Flood adaptation assessment allows managers to understand the levels of flood vulnerability and to recognising the damages and costs (Ranger *et al.,* 2011; Younus and Harvey, 2013). Tourism adaptation to flooding has become dimensional, functional, and geographical. Tourism development activities take place at different times (seasons) and places (regions) based on dependence and adjustability to climate (Hein *et al.,* 2009; Lew, 2013; Sharma and Franks, 2013; de Kumar, 2015). The adaptation to any climate change risk has become a key issue since the 2012 International Climate Policy negotiations in Europe and again in 2016 during the Climate Change Agreement Summit in Paris, France (Gössling *et al.,* 2010; Ciscar *et al.,* 2011; Scott *et al.,* 2016; Kundzewicz *et al.,* 2017). Flood adaptation plans

to reduce the vulnerability of tourist destinations and businesses, compliments destination mitigation efforts (IPCC, 2012; De Urioste-Stone *et al.,* 2015; Scott *et al.,* 2015). The implementation of adaptation plans effectively manages the risks, to regulate the economic activity and to advance the business (Jopp *et al.,* 2010; Walsh *et al.,* 2013; Michailidou *et al.,* 2016). Flood adaptation can be categorised into three sections namely, behavioural, technical and business adaptation (Ciscar *et al.,* 2011; Klint *et al.,* 2012; Hall *et al.,* 2013). Flood adaptation plans are developed to address responses to benefit the local communities (Weaver, 2011; Scott *et al,* 2016).

Tourism studies to explore and demonstrate how tourism businesses respond to flooding impacts currently relates to responses from tourism policymakers (Pham *et al.,* 2010; Walters *et al.,* 2014; Ghaderi *et al.,* 2015). Tourism accommodation businesses with a less adaptive ability within destination regions and communities trigger the decision-making and the development of adequate adaptation plans (Kaján and Saarinen, 2013; Walsh *et al.,* 2013; Amelung and Nicholls, 2014). In tourism research, adaptation is documented under the practical application of the tourism system, changes and decision-making (Kaján and Saarinen, 2013; Kietäväinen and Tuulentie, 2013). Adaptation research in a social science context should address the socio-economic vulnerability (Mustafa *et al.,* 2011; Kaján ans Saarinen, 2013; Njoroge, 2014). These challenges arise together with the mitigation and adaptation impact policies and tourist mobility (Nicholls *et al.,* 2007; Scott, 2011; Garland, 2014). Flood adaptation challenges for tourist accommodation include how interconnected the business is with amongst other things, the change of products and services offered to tourists (Hall, 2010; Kaján and Saarinen, 2013; Filatova, 2014; Klijn *et al.,* 2015) . The tourism accommodation sector has a weaker adaptive capacity and is relatively weaker to that of other tourism businesses, since they cannot move locations and flooding impacts on them are always place-based (Tsai and Chen, 2011; Walmsley, 2011; Becken and Wilson, 2013; Crona *et al.,* 2013).

Tourism managers should implement disaster planning as a core competency tool (Faulkner and Vikulov, 2001; Tsai and Chen, 2011; Suh *et al.,* 2012; Kellens *et al.,* 2013; Lew, 2013). For this reason, it is important to study tourism alongside extreme weather events and disaster response plans (Gómez Martín, 2005; Hamzah *et al.,* 2012; Gómez-Martín *et al.,* 2014a; Méndez-Lázaro *et al.,* 2014;). Tourism and hospitality studies mainly focus on the accommodation and small tourism businesses' view of flooding impacts (Jarvis and Ortega, 2010). These tourism businesses have an important role to play in implementing mitigation

and adaptation plans to understand the link between their tourism business and the flooding impacts (Becken and Hughey, 2013a; Njoroge, 2014; Scott *et al.,* 2015). Tourism adaptation research has recently begun to investigate how tourism businesses and other stakeholders engage in the flooding impacts (Nicholls *et al.,* 2007; Kundzewicz *et al.,* 2008; Turton *et al.,* 2010; Becken and Hughey, 2013; Njoroge, 2014). Tourism adaptation research papers on tourism and climate focuses on biophysically constructed relief indices, the potential flooding impacts and lastly the adaptation of different tourism accommodation businesses in different locations (Bigano *et al.,* 2006; Bigano *et al.,* 2007; Becken, 2013).

The adaptation of tourism to climate change and flooding impacts have been emphasised as critical research in South Africa (Awuor *et al.,* 2008; Weaver, 2011; Klint *et al.,* 2012; Steyn, 2012; Steyn and Spencer, 2012; Sharma and Franks, 2013; Garland, 2014). Tourism and adaptation literature has been emerging recently and a few systematic reviews predict future challenges (Becken, 2013; Kaján and Saarinen, 2013; Kellens *et al.,* 2013). Tourism and adaptation literature does not fully address adaptation challenges, tourism dimensions of vulnerability and the implications for local communities (Kaján and Saarinen, 2013; Garland, 2014; Njoroge, 2015). Adaptations to flood damages are often challenging and may be a timely process. Flooding adaptation plans include restoring and widening river and drainage channels, improving infrastructure, land use policies and planning, extended risk transfers and improved preparedness (Ranger *et al.,* 2011; Wilby and Keenan, 2012; Heritage *et al.,* 2014; Filatova, 2014). These adaptation plans are commendable, but they do not function or appear to include the wider impacts of flooding on the long-term planning prospect (de Freitas, 2003; Ranger *et al.,* 2011; Walsh *et al.,* 2013; Gómez-Martín *et al.,* 2014a). Tourism business adaptation plans overlook present day flooding risk management and leads to problems with vulnerability, flexibility to adapt and costly mal-adaptation (Hay and Mimura, 2010; Ranger *et al.,* 2011).

The Netherlands have experienced more frequent and higher level floods over the past several decades due to the accelerated change in climatic conditions, and over 55% of the country's surface is flood-prone (Jonkman *et al.,* 2008; Klijn *et al.,* 2009; Klijn *et al.,* 2015; Hegger *et al.,* 2016). The Netherlands have led by example in taking climate change into consideration. The Netherlands has initiated a national delta programme for the Rhine, Meuse and Scheldt rivers that form the delta (Geipel, 1999; Persoons *et al.,* 2002; Booij, 2005; Klijn *et al.,* 2015). The national delta programme led to the establishment of various climate change adaptation projects. The flood adaptation projects are the Adaptation of Spatial Planning to Climate

Change (APK), the Knowledge of Climate Change (KfC) and the Flood Risk Assessment and Management (FRAM) project (Buchecker *et al.,* 2013; Walsh *et al.,* 2013; Filatova, 2014; McKercher *et al.,* 2014; Sitoe *et al.,* 2015; Nasiri *et al.,* 2016). Flood risk management entails the reconsideration of the underlying principles and the application of portfolios of practical measures versus spatial planning and other policy instruments (Buchecker *et al.,* 2013; Klijn *et al.,* 2015; Jenkins *et al.,* 2016; Hegger *et al.,* 2016).

2.7.2. The tourism accommodation sector: flood management

Climate change causes a shift between global, national and regional levels. It thus becomes important to include demographic, socio-economic and land-use developments to understand the magnitude and adaptation management. Van Rhee (2012) mentioned four principles for adaptive flood management. The first principle includes short-term decisions based on long term plans. The second principle identifies adaptation pathways to aim for future risk. The third principle determines the flexibility in collective and individual measures and comprehensive strategies to prevent underperformance or overinvestment. Lastly, the fourth principle merges the goals and development initiatives to increase benefits (Van Rhee, 2012). Before the assessment and management of flood risks take place, the different perceptions should be understood as to how a flood risk is defined. Also, how and why flood risk develops, how perceptions are influenced to reduce flood risks (ability and measures) and lastly how all are combined to understand flood risks which are seen as hazards for preliminary assessments (Brody *et al.,* 2007; FLOODsite, 2009a; Klijn *et al.,* 2009, 2015; Balica *et al.,* 2013; Heritage *et al.,* 2014; Bernard and Cook, 2015). Flood risk management plans aim to reduce the risks at all levels of society and the environment (Olorunfemi, 2011; Wilby and Keenan, 2012; Hegger *et al.,* 2016). Flood risk management plans assist in promoting the vulnerability to floods to control and reduce the structural damage through non-structural approaches (Gouldby *et al.,* 2010; Olorunfemi, 2011). Non-structural approaches reveal both the physical and socio-economic vulnerabilities (Olorunfemi, 2011).

Tourist accommodation establishments have made it part of their management structure to work with unwanted incidents or possibilities of things going wrong to improve their competitiveness (Rogerson, 2013; Michalkó *et al.,* 2015). *TripAdvisor* and *Booking.com* have become popular traveller social media platforms, together with *Facebook*, *Twitter* and

Instagram, where tourists create personal blogs to comment on tourism and tourist destinations (Steene, 2005; Björk and Kauppinen-Räisänen, 2012; Inouye, 2014; Hall *et al.,* 2015; Michalkó *et al.,* 2015; Schuckert *et al.,* 2015). Tourism accommodation managers have gained insight into these social media platforms to market and advertise promotions and any other special offers (Steene, 2005; Michalkó *et al.,* 2015; Schuckert *et al.,* 2015). They have also begun to utilise them to deal with tourist or travellers' concerns, comments and any other issues (Huebner, 2012; Michalkó *et al.,* 2015). They mainly utilise it for identifying problems and to reduce the issue of risk and disappointment. Tourism businesses in environments prone to flooding should measure and manage floods to recognize the flood safety factors, flood resilience and resistance of both new and existing infrastructure (Wilby and Keenan, 2012). Management should modify rules to develop control under flooding episodes, flood forecasting, risk area retreats and periodically review and adapt to new management guidelines (Wilby and Keenan, 2012). Tourist destinations have to focus on the responsibility to include tourists, tourism businesses, enterprises and the local communities for flood risk management (Steene, 2005; Benjamin, 2008; Adamson *et al.,* 2016; Hegger *et al.,* 2016).

Sustainable regional tourism planning can include systems of limits to acceptable change (LAC) to form the basis for research and serve as an adaptation model to apply (Ahn *et al.,* 2002; Cullis *et al.,* 2011; Cartwright *et al.,* 2013; Njoroge, 2014). Flood risk management research and flood adaptation models will assist in determining the amount of change and development to justify tourism development zones (TDZ's) (Ahn *et al.,* 2002; Bernard and Cook, 2015). Tourism constantly changes through development to facilitate and program opportunities for local communities (Ahn *et al.,* 2002; Ritchie, 2008). Sustainability and vulnerability has become an important tool for tourism destination competitiveness (Yohe *et al.,* 2007; ECORYS, 2009; Buzinde *et al.,* 2010; World Economic Forum (WEF), 2013; Espiner and Becken, 2014; Michailidou *et al.,* 2016). Tourism businesses have to adhere to the sustainable development principles to understand the different dimensions of vulnerability (economic, social and environmental) (Mustafa, 2005; Zhang *et al.,* 2009; Huebner, 2012; Espiner and Becken, 2014; Njoroge, 2014; Torres-Delgado and Palomeque, 2014). The tourism accommodation sector should liaise with government for management frameworks, strategies, and approaches to ensure flood protection, investment, and insurance. Tourism stakeholders play a key role in determining flood management plans (Kundzewicz *et al.,* 2008; Mondlane, 2010; Guinea Barrientos and Swain, 2015).

2.8. The tourism accommodation sector assessment of flooding impacts

Flooding impacts can be assessed in various ways, dependent on the scale and duration of floods. Floods can be assessed through economic impacts, socio-cultural impacts, environmental impacts and other related impacts on society (Guinea *et al.,* 2015; Klijn *et al.,* 2015; Arvind *et al.,* 2016). Floods tend to discontinue, disturb and damage property, the environment, livelihoods and daily activities. The most prevalent way to assess flooding impacts are in economic ways (Jonkman *et al.,* 2008; Younus and Harvey, 2013; Fitchett *et al.,* 2016). This is due to the costs, recovery, business loss, time and compensation after floods. Economic evaluation of flood impacts on a business are usually purpose- related and context-dependent, meaning the rationales of assessing the economic values are different in flood management and adaptation plans (Merz *et al.,* 2010). Floods can further be assessed in environmental and socio-cultural ways (Pasquini *et al.,* 2013; Smith *et al.,* 2015). Direct flooding impacts can be measured and indirect flooding impacts are projected to understand the time scales in months and years (Merz *et al.,* 2010). The section will include flood impact scales specifically focussing on flood research, data collection, and spatial and temporal flood assessment scales. Flooding impacts are further classified for assessment that includes flood measurement, assessment methods for floods, and flood education and adaptation models.

2.8.1. Assessment scales for flooding impacts

Detailed assessments allow sectors and regions to design prioritized adequate adaptation plans (Yeo, 2002; Ciscar *et al.,* 2011; Walsh *et al.,* 2013). Advances in flood impact assessment can improve subsequent methods in terms of applications, comparisons and time-scales (Gouldby *et al.,* 2010; Merz *et al.,* 2010). However, a misunderstanding is evident, since the relevance of impact assessment does not match the quality of available flooding models and datasets (Merz *et al.,* 2010; Smith *et al.,* 2015). More research efforts are needed for empirical and synthetic data collections to provide consistent and reliable flood data (Merz *et al.,* 2010; Velasco *et al.,* 2015). Flooding research has shown the progress in flood damage data collection, analysis and adaptation development (Jonkman *et al.,* 2008; Merz *et al.,* 2010; Hapuarachchi *et al.,* 2011). The flood impact assessment scales are methods for tourism businesses to undertake, for successful flood management. Table 2.4 (below) presents how flooding impacts can be organised into different spatial and temporal scales to understand all

affected elements of an area (Merz *et al.,* 2010; Rowberry *et al.,* 2011; Becken *et al.,* 2015). These spatial and temporal scales classify the flooding impacts as micro-, meso- and macro-economic effects to understand the long-term barriers to regional development in flood-prone areas (Gouldby *et al.,* 2010; Merz *et al.,* 2010).

Table 2.4: Flooding impacts assessment on different spatial and temporal scales to understand all affected elements of an area

Micro scale	**Meso scale**	**Macro scale**
Single element assessment	Spatial aggregation assessment	Large and collective scale damage estimations and assessment
Damages calculated individually	Damages on land use units and size	Administrative and management units

(Source: Adapted from: Merz *et al.,* 2010).

After a flood event, tourism businesses can be affected over a period of time based on the different business divisions, and the diffusion of short-term costs and timed responses (Ranger *et al.,* 2011; Olya and Alipour, 2015). A clear distinction can be made between direct and indirect flooding impacts after the impacts are ordered in ranks of importance (Merz *et al.,* 2010). The distinctions are made between the perceived and actual impacts and damages importance (Merz *et al.,* 2010). The perceived or potential impacts are estimates of the damages that can occur during a flooding event. The different scales of flood assessment can be based on a single element or large and collective damage estimates. The mirco-scale assesses smaller factors, whereas the meso- and macro-scale assesses complex units of flood damages. The land use and size is an important factor, especially for tourism businesses who want to assess the wider flooding impacts in and around their operation environment. The actual impacts are projections of the damage that occurred during a flooding event (Merz *et al.,* 2010). Lastly, the administrative and management units under the macro-scale for flood assessment are the most important assessment, since floods can directly affect internal operations that can cause a business to collapse. Holistically, flooding impacts on tourism should be approached and assessed to include the wider impacts of vulnerable tourist activities and destinations (Hein *et al.,* 2009; Kundzewicz *et al.,* 2013).

2.8.2. Flood impact classifications for assessment

Different flooding impacts have to be classified to ensure for assessment and evaluation (Asante *et al.,* 2007; Arvind *et al.,* 2016). Flooding impacts are classified for assessment, specifically to separate the valuable and the non-valuable, the sensitive and the non-sensitive and lastly, the large and small scales of damages. Flood assessment classification is a flood analysis method to determine different types of flood damages. Flood assessment classification scales are therefore useful to assist business managers with decision-making and policy reviewing. Flood impact assessments allow a business to focus on the loss to improve measures to prevent future flood risks (Yeo, 2002; Buchecker *et al.,* 2013; Hewitt, 2013). The prevention of floods require planning which is adopted as a precautionary approach to reduce the flood risks and create flood awareness (Yeo, 2002; 2003; Cheung and Law, 2006; Hay and Mimura, 2010). Local flood education will ensure that businesses, communities and individuals in flood-prone areas are made aware of possible floods (Mustafa, 2002; Yeo, 2002; Woodward *et al.,* 2014). Floods have become an annual problem for some businesses and no comprehensive or organised research focuses on the classification of long-term flooding impacts.

Flood assessment allows for the modeling of flooding impacts, especially across different temporal and spatial scales. Flood assessment scale models are similar to flood adaptation models, but distinctions are made between the two through the different elements the models assess and evaluate. Hallegatte (2008) has developed an Adaptive Regional Input-Output (ARIO) model to assess and classify direct and indirect flooding impacts. The ARIO model takes into account any changes in business, management, production, behaviours and methodologies (Ranger *et al.,* 2011). The ARIO model interprets the scale and frequency of potential flood damages and classifies the flood events (Tsai *et al.,* 2013). The model assesses the broadcasting among flood affected business sectors, the reduced demands, the reconstruction needs and the economic-agent behaviours (Brody *et al.,* 2007; Hallegatte, 2008). The assessment allows for the monitoring of any coping mechanisms to the flooding impacts, the resource limitations, and the relationship with other regions not affected (Hallegatte, 2008). This model is useful for both the affected and unaffected regions to determine, assess, and classify the socio-economic losses and possible barriers (Hallegatte, 2008).

2.9. Barriers to assessing perceived flooding impacts on the tourism accommodation sector

The tourism accommodation sector should recognise risks in advance and plan how to manage them, since they can negatively influence the development and growth of the sector (Shaw *et al.,* 2012; Pasquini *et al.,* 2013; Michalkó *et al.,* 2015). Flooding impacts on the tourism accommodation sector include many challenges in interacting with the environment and the local community. Flood barriers include factors that hinder the affected business to continue with the flood assessment, management and adaptation (Zerger and Wealands, 2004; Guinea Barrientos and Swain, 2015). The barriers to assess the perceived flooding impacts on the tourism accommodation sector have become twofold, since the sector is constantly undergoing reconstruction and development. Developing tourist destinations have poor response rates and coping mechanisms to disasters (Few, 2003; Khandlhela and May, 2006; Woodward *et al.,* 2014). Tourism at local and national level have begun to assess flooding impacts that create significant uncertainties for the sector (Filimonau *et al.,* 2011; Gössling *et al.,* 2012; Klijn *et al.,* 2015). The level of flooding impacts on tourism demand is not understood due to an inadequate level of environmental awareness (Mbedzi, 2011; Su *et al.,* 2012; Kaján and Saarinen, 2013; Juvan and Dolnicar, 2014). The current barriers the tourism accommodation face should be explored to gain understanding why they experience challenges when assessing their perceived flooding impacts.

2.9.1. The tourism accommodation sector flooding impact assessment challenges

Flooding impact assessments have become more complex, since the climate variability is linked to wider socio-economic factors (Yu *et al.,* 2009; Tol and Walsh, 2012). The flood assessment difficulties led to concerns over future weather related impacts and adequate adaptation plans for tourist accommodation businesses (Cartwright *et al.,* 2013; Woodward *et al.,* 2014). It has always been challenging addressing and assessing flood impacts and vulnerabilities (Olorunfemi, 2011; Scott *et al.,* 2016). This is mainly due to the reduced scholarly attention and the emphasis on traditional management responses and approaches to mitigate and adapt to flooding impacts (Olorunfemi, 2011; Scott *et al.,* 2016). A few common barriers around the perceived flooding impact assessment include different degrees and scales of challenges. Short-term planning, costs, lack of awareness, inadequate adaptation plans, failure to respond are common flood assessment barriers implementation level challenges

(Nhamo, 2013; Gómez-Martín *et al.,* 2014b). The implementation of adaptation plans, research and information insufficiency, and technological restrictions and doubts leads to numerous flood assessment barriers that the tourism accommodation sector cannot overcome (Nhamo, 2013; Gómez-Martín *et al.,* 2014a).

In South Africa, the tourism accommodation sector faces consequences of floods and the subject appears to be a neglected field of study. The barriers to assess flooding impacts indicates a lack of mutual understanding between the relationship of floods and tourism (Cohen, 2007; Tempelhoff *et al.,* 2009b; Rowberry *et al.,* 2011). South Africa has weather conditions appreciated by tourists with about 300 sunny days per year that promotes outdoor tourism especially during the summer months (Gbetibouo and Hassan, 2005; Mbedzi, 2011; Steyn and Spencer, 2012). Tourists are not attracted to areas undergoing extreme weather conditions (Conelius *et al.,* 2009; Steyn and Spencer, 2012;). Tourism businesses also do not develop in areas with inclement weather, since climate and weather risks can affect the growth and profitability of the sector. Many tourist regions and resorts are located adjacent to water bodies, making these areas vulnerable to flooding impacts (Steyn and Spencer, 2012). Making South African tourist destinations and products climate smart has proved to be problematic over the years (Tol and Walsh, 2012; Kietäväinen and Tuulentie, 2013). This is normally due to the differences in strategic choices, plans, information transfer, knowledge, and creating awareness (Yu *et al.,* 2009). Floods in South Africa occur more frequently in-land, causing physical damages resulting in disruption of businesses and infrastructure (Honert and McAneney 2011; Olorunfemi, 2011; Wolf and Moser, 2011). Flood research in South Africa has increased and allowed for the improvement of flood hazard approaches to effectively model and analyse floods (de Bruijn, 2004; Olorunfemi, 2011). However, this is not the case for the rest of Africa (Olorunfemi, 2011).

The local adaptation approach to flooding impacts in South Africa has faced difficulties in prioritising the damage-cost functions over economic activities (Brody *et al.,* 2007; Cartwright *et al.,* 2013). Flood damage prevention projects have been neglected by local municipalities and have failed to reach the provincial and national government (de Groen and Robinson, 2015). Unpredicted floods across South Africa affect large areas without warning, mainly in the form of flash flooding (de Groen and Robinson, 2015). Major flooding events have led to a shift away from flood protection to integrated approaches to flooding (Olorunfemi, 2011). Tourism has to adopt a more content- rich analysis approach for flooding and adaptation

research to explore the implications of flooding impacts on the tourism sector (Ciscar *et al.,* 2011; Kaján and Saarinen, 2013). Urban environments closely linked to tourism with areas of opportunities, flux and functionality have increased their adaptive measures to minimise climate- related risks (Cartwright *et al.,* 2013). Concerns are raised about the less-urbanised and underdeveloped areas where tourism is important to the local economy (Cartwright *et al.,* 2013). The spatial distribution of adaptive measures to combat climate- related impacts are not evenly spread (Cartwright *et al.,* 2013). The short term effects of flooding impacts can have economic impacts on the regional economy, but the longer-term effects are much more significant (Khandlhela and May, 2006; Kaján and Saarinen, 2013). Information on floods in the country can be understood by observing the trends in temperature and rainfall. These trends may be inconclusive and unpredictable (Olorunfemi, 2011).

2.10. The South African flood forecasting and information for tourism businesses

A number of flooding events have taken place over Africa since the mid-1990s which resulted in fatalities and high economic losses (Nhamo, 2013; Nicholson, 2016). It led to the development of a probabilistic flood forecasting system of medium to large-scale floods from the African river basins (Nhamo. 2013; Thiemig *et al.,* 2015; Nicholson, 2016). The *African Flood Forecasting System (AFFS)* is a warning system, reporting the occurring floods in particular basins and the estimated losses (Nhamo. 2013; Thiemig *et al.,* 2015; Nicholson, 2016). The AFFS assist in reducing flood losses and provides an inventory of current flooding status in and across Africa based on reviewed literature (Nhamo, 2013). The AFFS can further assist in African flood risk management (Nhamo. 2013; Thiemig *et al.,* 2015; Nicholson, 2016). South Africa is currently experiencing severe rainfall fluctuations, and flood forecasting and warning systems may useful in updating the information in time (Dlodlo, 2012; Mekiso *et al.,* 2013). Flood warnings and security risks should be implemented in regions vulnerable to floods in South Africa, to sustain tourism for local economic development (Steyn and Spencer, 2012; Poolman *et al.,* 2014). Forecasting is the prediction of something that will happen. Warning systems provides information and allows for communication so people can take action (Tempelhoff *et al.,* 2009; Fatti and Vogel, 2011; Dlodlo, 2012; Cartwright *et al.,* 2013). Communication during crises for tourism and destinations should include safety and security plans to minimise or avoid risks (Steene, 2005; Gómez-Martín *et al.,* 2014a). Flood sensor

networks have been developed to predict severe storms causing flooding and to communicate and monitor floods in developing African countries (Dlodlo, 2012; Bangira *et al.,* 2015). The amount of rainfall, soil texture and quality, temperatures and time are important variables to measure the occurrence of floods (Dlodlo, 2012; Knight and Evans, 2017).

2.10.1. Weather forecasting systems

The forecasting of rain is seen as a difficult weather prediction task due to the complexity and variability of rainfall processes and the accurate prediction of other depending factors (Dyson, 2009; Hapuarachchi *et al.,* 2011; Ekblom *et al.,* 2012). The South African Weather Services (SAWS) have begun to focus on the causes of flash flooding, particularly the Limpopo River basin (Oyekale, 2005; Malherbe *et al.,* 2014; Maposa *et al.,* 2014; Komen *et al.,* 2015; De Groen and Robinson, 2015; Du Plessis and Burger, 2015). This will improve the quality of flooding information in different areas and provide real time flood observation and analysis information (De Groen and Robinson, 2015). These improvements in flood forecasting will assist in identifying the flood hazard, vulnerability and manageability of areas (World Meteorological Organization, 2012; De Groen and Robinson, 2015; Thiemig *et al.,* 2015). Informed decisions and plans in flood-prone areas can reduce the proposed risks (De Groen and Robinson, 2015). However, more work is needed to develop and implement a homogenous flood risk approach to rate vulnerability and adaptation (Mondlane, 2010; De Groen and Robinson, 2015). No guidelines are provided yet and some ratings might not be relevant to a South African context (De Groen and Robinson 2015). Mioc *et al.,* (2008) state that flooding impact methods are needed to predict flooding impacts as key representations for decision making and management.

Tourism scholars attempt to distinguish between a tourism environment able to adapt and implement measures to manage flood warning, impacts, and recovery costs (Wilby and Keenan, 2012; Walters *et al.,* 2014). If environments are enabled for adaptation and the implementation flood management, the experiments of routine monitoring, flood forecasting, data exchange, bridging organisations, institutional reform, disaster planning and legal financial support will reduce the tourism environments' vulnerability (Wilby and Keenan, 2012). The current challenge with tourism studies and investigations is that the vulnerability, development, disaster plans, and communication channels remain vague (Steene, 2005; Kundzewicz *et al.,* 2008; Espiner and Becken, 2014; Bernard and Cook, 2015). Tourist safety

and security can be improved at tourist destinations through strategies to identify, reduce, communicate, and overcome risks, and their negative consequences (Steene, 2005; Rittichainuwat, 2007; Mura, 2010; Windle and Rolfe, 2013; Espiner and Becken, 2014).

2.10.2. Flood risk communication systems

South African hydrological models make use of rainfall data to measure the runoff paths, to determine the area or region that might be at risk of floods. These models include methods covering all possible factors of the environment and the society to integrate the flood hazards and vulnerability (Smithers *et al.,* 2001; Olorunfemi, 2011; Mekiso *et al.,* 2013; Botai *et al.,* 2015). For example, the hydrological models include closing runoff paths, capturing excess rainfall and using sandbags to block and absorb rainfall. The need to improve the communication before and after floods in South Africa has become a pressing issue. The country has started experiencing an increase in coastal and inland flooding events (Sen Roy and Rouault, 2013; Faasen, 2014; Bangira *et al.,* 2015). The improvement in flood management mainly focusses on the operational structures to include communication tools to ensure valid information and awareness to determine any flood incidents (Tempelhoff *et al.,* 2009; De Groen and Robinson, 2015). A few concerns have been raised regarding the risks and crises in the tourism sector. These include the tourism professionals and community perceptions are influenced by media coverage and images that affects the tourist destination (Steene, 2005; Gómez-Martín *et al.,* 2014a; Ridderstaat *et al.,* 2014). Images and videos about floods are dramatic and severe on national television. Media footage can completely change the perception they carry that the area is still flooded, despite that the event and its impacts may be short-lived (Steene, 2005; Nilsson and Gössling, 2013; Schuckert *et al.,* 2015). Fear and concerns about safety and security increase and tourists cancel their travel plans to the area/destination affected by floods, although clean up and recovery actions may already be in place (Steene, 2005; Mioc *et al.,* 2011).

2.11. Conclusion: Past flooding experiences and lessons learnt

There are a few gains from flooding episodes, but unfortunately, the negative impacts outweigh the few positive gains (Becken and Hall, 2007; Ciscar *et al.,* 2011; Méndez-Lázaro *et al.,* 2014; Hall *et al.,* 2015). Despite the growing threat of floods to tourism businesses and destinations, only a few tourism businesses are prepared and able to handle the impacts (Gouldby *et al.,*

2010; de Sausmarez, 2013; Espiner and Becken, 2014). Some tourism businesses are not aware of the flooding impacts and the associated damages for their business operations (Yeo, 2003; Bernard and Cook, 2015). The challenge is to assess the different types of flooding impacts, since the tourism sector is a climate dependent sector (Hein *et al.,* 2009). The tourism sector immediately experiences the flooding impacts through disruptions, leaving tourists to visit elsewhere (Zahed *et al.,* 2014). The outcomes of flooding impacts can be misunderstood due to limited knowledge on flood risks and protection (Mustafa, 2005; Amelung *et al.,* 2007; Nicholls *et al.,* 2007; Amelung and Nicholls, 2014; Zahed *et al.,* 2014).

Tourism scholars are focusing on the short-term flooding risks, since it is at the interest of tourism stakeholders (Scott, 2011; Guinea Barrientos and Swain, 2015). Effective planning and management is needed for flooding episodes (Law *et al.,* 2012; McKercher *et al.,* 2014; Fodness, 2016). Tourism business leaders should cautiously plan their infrastructure to avoid flood-prone areas (Nyaupane and Chhetri, 2009; Tsai and Chen, 2011; Dubois *et al.,* 2016). Many studies have been conducted on the flood impacts and risks, however very little is done with respect to flood vulnerability (Fekete, 2009; Balica, 2012). The flood models should be known to determine the vulnerability of a region. Flood hazards have to provide accessible information to include the wider risk management activities of an affected flood region (Gouldby *et al.,* 2010). To ensure tourism stability and sustainability, tourism businesses have to reflect and take into account their experiences to manage their current flood impacts (Kruger and Saayman, 2014).

Future links between localised flooding impacts and tourism can be highlighted as a strategy to increase awareness, concern, and action in flooded regions. The challenges climate-compatible developments face denotes a complex understanding of readiness to adapt to climate change (Nhamo, 2013; Espiner and Becken, 2014; Scott *et al.,* 2016). Tourist destinations, resorts, hotels, tour operators, and other businesses operating in the tourism sector need to understand and appreciate the importance of planning for disasters, crises and risks (Dessai *et al.,* 2004; Ritchie, 2004; Steene, 2005; Michailidou *et al.,* 2016). Flooding impacts affect tourist products and opportunities (Wyss *et al.,* 2014). Climate change variables, including that of floods is acknowledged to occur on a global and regional scale and is well conceptualised in terms of its effects on tourist activities (Gbetibouo and Hassan, 2005; Yu *et al.,* 2009; Méndez-Lázaro *et al.,* 2014). Flooding impact perceptions on the tourism offerings include flood adaptation delegation processes with various actors (de Freitas and Marmaras,

2001; Kundzewicz *et al.,* 2008; Lyon, 2013; Wyss *et al.,* 2014; Guinea Barrientos and Swain, 2015).

Climate change projections will increasingly affect tourism development and management (Hein *et al.,* 2009; World Tourism Organisation (WTO), 2009; Scott and Lemieux, 2010; Ciscar *et al.,* 2011; Becken *et al.,* 2015; Kundzewicz *et al.,* 2017). Tourism destinations, businesses, and resources need to fit into the climate change and global warming focus (Jarvis and Ortega, 2010; Rogerson and Sims, 2012; Saarinen *et al.,* 2012; Adler *et al.,* 2013; Shani and Arad, 2014; Njoroge, 2015). The development of tourism should include environmental management, to develop tourism in protected or sensitive areas (Rogerson and Sims, 2012; Tsai *et al.,* 2013; Njoroge, 2014; Shani and Arad, 2014; Michailidou *et al.,* 2016; Yazdanpanah *et al.,* 2016). The problem of tourism environmental management is evident with smaller destinations, resorts, and accommodation types that are not well prepared for climate change disasters during development (Steene, 2005; Hall, 2006; Hamzah *et al.,* 2012; Becken *et al.,* 2014). The role of tourism as a driver of economic growth and development has been widely adopted (Adler *et al.,* 2013; Rogerson and Visser, 2014). For sustainable and responsible tourism development and planning, a balance is required between the tourists, the environment, the local community, and other involved stakeholders (de Freitas and Marmaras, 2001; van der Merwe, 2005; Spenceley, 2006; Zhang *et al.,* 2009; Biggs *et al.,* 2014; Sharpley, 2014).

3. CHAPTER 3: STUDY SITES AND METHODOLOGY

Higher, higher, grows the flood-tide.
Deeper, deeper, is the gloom;
homeless thousands, starving hundreds.
Is the city's awful doom. ~ George C. Rhoderick, Jr.

3.1. Introduction: Flooding events on a local level across different regions

For research to be successfully conducted, a concise methodology has to be established. This research includes a theoretical framework the *Flood Hazard Scope Theory* to explore meaningful content measured by a detailed methodology. This chapter begins with an overview of the Limpopo Province focusing on the research study sites: the Waterberg, Vhembe, and Mopani regions of the Province. The regions are described in terms of their geographical and climate setting, main industries, tourism activities and tourist accommodation. A starting sample size of 145 tourist accommodation respondents was purposefully identified. A total of 119 tourist accommodation managers or owners participated in the study. 101 answered a questionnaire, ten responded via telephone and eight replied via email. The data collection process included the researcher's reflections, followed by the advantages and limitations of each methodological step and the type of research. The data analysis process used follows the content analysis process. The chapter concludes with the identification and understanding of the limitations and benefits, of the methodology.

The research attempts to identify and understand the flooding impacts on tourist accommodation. The researcher attempts to generate understanding of how and why managers perceive, reflect and interpret flooding impacts on their establishments. This further links to how these tourist accommodation managers survive in the hospitality industry. The primary aim of this study is to explore the perceived management's perception of flooding impacts on tourist accommodation in the Waterberg, Vhembe and Mopani regions in the Limpopo Province, South Africa. The research aim is achieved through the following research objectives:

- To explore the tourist accommodation managers' perception of changes in tourist reservations in an event of a flood.
- To determine if the tourists' length of stay is affected during flooding episodes.

- To critically evaluate whether there are adaptation plans for tourist accommodation vulnerable to floods.

The research objectives will allow for applicable themes to be developed. When research adopts a qualitative approach, the aim is to identify themes, commonalities and implications between collected data (Baker and Edwards, 2012; Robinson, 2014; Baker, 2015). Based on previous studies with similar aspects such as this one, the gathering of descriptive qualitative data were needed to formulate ideas for intervention (Anderson, 2007; Trafimow, 2014). With content analysis, the researcher has reflected on the research objectives to identify codes, categories and themes. This further allowed the researcher to categorise the main findings and argument flow under the respective research objectives.

3.2. The study site: Limpopo Province

The Limpopo Province was selected to make use of the Waterberg, Vhembe and Mopani regions as study sites. The Limpopo Province is described followed by a description of each study site. The Limpopo Province is found in the northernmost part of South Africa with a total land area of 11 960 600ha and covers 10.3% of South Africa's land surface (Spenceley, 2006; Sikhwari, 2008; Mbedzi, 2011). The Province shares geographical borders with Zimbabwe, Botswana and Mozambique (Mbedzi, 2011). Limpopo is seen as the Province of Peace and is attractive to tourists (Mafunzwaini and Hugo, 2005; Ladzani and Africa, 2010). The Limpopo Province has an abundance of natural resources, including game farms and has a suitable climate for tourism development (Mafunzwaini and Hugo, 2005; Sikhwari, 2008; Ladzani and Africa, 2010; Boonzaaier, 2012; Maponya, 2012). The Limpopo Province has five regions namely; Capricorn, Vhembe, Mopani, Greater Sekhukhune and Waterberg which collectively consist of 26 local municipalities (Aphane, 2011).

The Limpopo Province is characterised as a subtropical summer rainfall region and receives over 90% of the mean annual rainfall between October and April (Smithers *et al.,* 2001; Reason *et al.,* 2005; Maponya, 2012; Malherbe *et al.,* 2014; Spaliviero *et al.,* 2014). The atmospheric moisture over the Limpopo Province tends to alter the summer precipitation pattern and the moisture is carried up north throughout the sub-tropical region (Holmgren *et al.,* 2003;

Conelius *et al.,* 2009; Engelbrecht *et al.,* 2013; Malherbe *et al.,* 2014). The warm moist air generates rainfall across the Province during the summer season (Reason *et al.,* 2005; Engelbrecht *et al.,* 2013). Rainfall distribution and temperature trends are likely to increase the occurrence and magnitude of floods in the Limpopo Province (Maponya and Mpandeli, 2012; Komen *et al.,* 2015; Sitoe *et al.,* 2015). High temperatures in the Province intensify the hydrological cycle, resulting in drought and flooding seasons (DWA, 2004; Rowberry *et al.,* 2011; Ekblom *et al.,* 2012; Mekiso *et al.,* 2013). The Province receives more than 700mm summer rainfall per annum and summer temperatures range between 17°C min and 42°C max and between -2°C min and 16°C max during winter (Reason *et al.,* 2005; Asante *et al.,* 2007; Sikhwari, 2008; Tshiala *et al.,* 2011; Ekblom *et al.,* 2012; Spaliviero *et al.,* 2014). The daily weather and climate forecasting for the Province now includes vulnerable regions to floods and heavy rainfall (Oyekale, 2005; Asante *et al.,* 2007; Komen *et al.,* 2015). The Limpopo River basin is a vulnerable area in the Province, because the basin is faced with multiple challenges from flooding events (Oyekale, 2005; Maposa *et al.,* 2010; Mondlane, 2010; World Meteorological Organisation, 2012; Spaliviero *et al.,* 2014). The Province has recently experienced floods that destroyed infrastructure and businesses during the period 2009 to 2016 (Khandlhela and May, 2006; Mondlane, 2010; Rowberry *et al.,* 2011; Maposa *et al.,* 2014a; Fitchett *et al.,* 2016). Figure 3.1 (below) presents the three study regions utilised for this research: the Waterberg, Vhembe and Mopani regions.

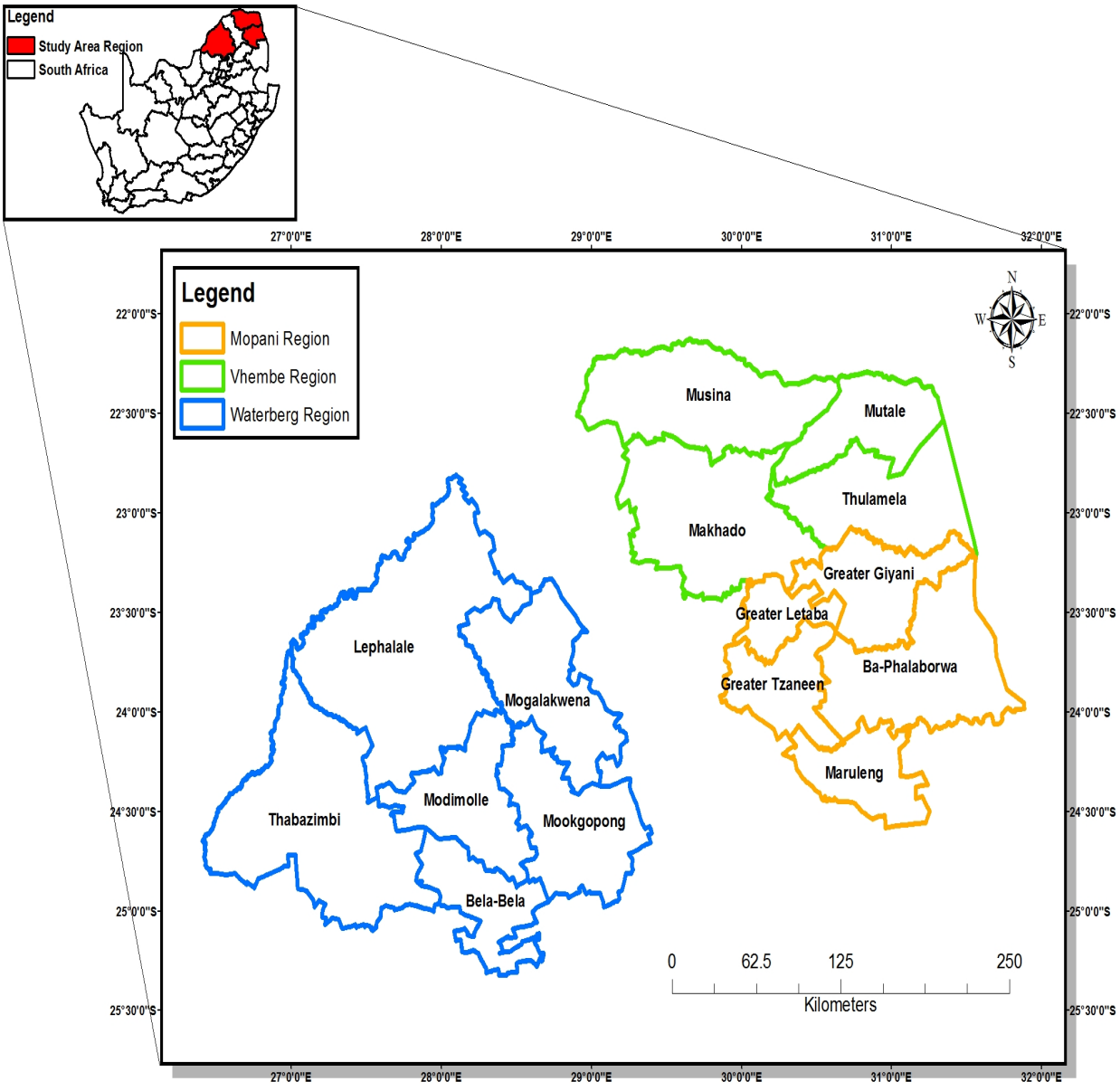

Figure 3.1: The research study sites within South Africa and the Limpopo Province (Source: Researcher's Map, 2016).

Tourism is a vehicle for local economic development and growth, in the Limpopo Province and tourism has become the fastest growing sector of the economy, to address socio-economic conditions (de Klerk, 2003; Spenceley, 2006; Fitchett *et al.,* 2016). The tourism market in the Province generates approximately R1 433 million per annum with R1 051 million from international visitors and R382 million from domestic visitors during the years 2009 to 2010 (Mafunzwaini and Hugo, 2005; Conelius *et al.,* 2009; Ladzani, 2010; Boonzaaier, 2012).

Tourism packages in the Province include all aspects of the environment, its cultural life and natural or scenic features (Hughes, 2005; Mafunzwaini and Hugo, 2005; South African Tourism, 2010; Rogerson, 2013b). Tourism has officially been accepted as an economic booster for the Province (Conelius *et al.,* 2009; South African Tourism, 2010; Mbedzi, 2011; National Department of Tourism, 2011). Nature and ecotourism is the fastest growing sub-sector of tourism within the Limpopo regions (Spenceley, 2006; South African Tourism, 2010; Hambira and Manwa, 2013; Rogerson and Mthombeni, 2015).

The Waterberg, Vhembe and Mopani regions of the Limpopo Province were selected as the primary study sites for this research. Floods have been occurring the Limpopo Province for the past decade and the three above-mentioned regions have been experiencing flooding episodes more frequently than the other regions of the Province. The three regions have been declared as disaster prone, particularly with flash flooding events (Mondlane, 2010). The rainfall across the three regions have fluctuated to include unusual storms and prolonged rainfall (Rowberry *et al.,* 2011). The average daily temperatures of the three regions are slightly higher than the rest of the Province. Changes in the weather leads to changes in the frequency, scale and location of floods. The Waterberg, Vhembe and Mopani regions are also seen as emerging tourism markets. Many tourism opportunities and tourist products are being developed across these three regions. With the increase of cultural, heritage and wildlife products, the regions have expanded their tourist accommodation sector. A wider variety of tourist accommodation exists across the regions. The growth of the tourist accommodation sector and the increase in flooding events across the three regions, justifies the choice of the study sites. Most of, much of the tourist accommodation is situated close to waterbodies and in areas known for flooding events, and therefore exposes the accommodation to floods. Various geographical components make the tourist accommodation vulnerable to floods, such as the changes in weather, the location and the past flooding experiences in affected areas. Aside from other in-land and coastal flooding episodes across South Africa, these three regions are prone to frequent flash flooding events where tourist accommodation facilities are situated.

3.2.1. The Waterberg Region

The Waterberg region of the Limpopo Province is situated in a mountainous region (de Klerk, 2003; Olivier, 2008; Lyon, 2013). Figure 3.2 (below) shows one of the study sites that will be

used for the study, particularly the densely-situated tourist accommodation in the flood prone towns of Lephalale and Bela-Bela. There is a variety of hotels, lodges, guest houses, bed & breakfasts and self-catering accommodation in the above-mentioned flood prone towns.

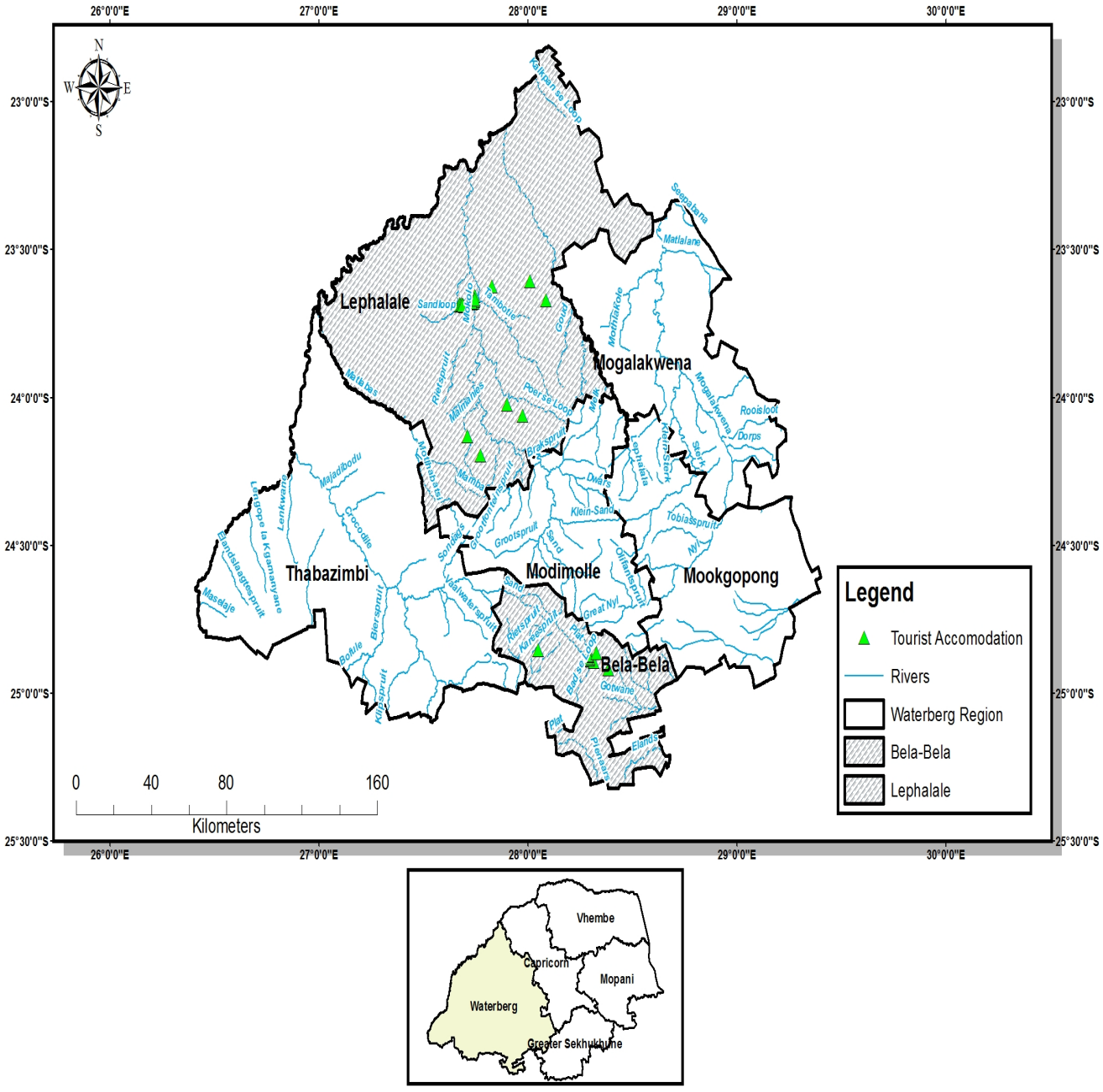

Figure 3.2: Tourist accommodation in the Waterberg region study site (Source: Researcher's Map, 2016).

Floods occur in the Waterberg region during the summer rainfall season particularly around running streams from the mountainous area (Barber *et al.,* 2003; Olivier, 2008; Olivier *et al.,* 2008; Waterberg Region Disaster Management Plan (WRDMP), 2011). The region has a landscape covering over 15 000 km² including valleys and tourist centres (Mzezewa *et al.,* 2010; Maponya and Mpandeli, 2012; Mekiso *et al.,* 2013). There are four areas in the region that are usually affected by the floods. First, the northern part of the region where the Plat River flow southward receiving water from the mountainous area of Elandsfontein (Olivier, 2008; Mondlane, 2010; WRDMP, 2011). Flooding from the Plat River leads to flooding around privately owned dams (the Bischoff, Roodepoort and Plat River dams) and flooding around the Buysdorp and Klein Kariba dam (Rowberry *et al.,* 2011; Boekstein, 2014; Fatti and Vogel, 2011). Second, the Springbokvlakte is a low-lying area accumulating water over long periods (de Klerk, 2003; WRDMP, 2011). Third, the Rust de Winter area is a catchment area of the Elands River which flows in a south-north direction (Rowberry *et al.,* 2011; WRDMP, 2011; Ekblom *et al.,* 2012). Floods here cause damage to commercial farming, tourism and conservation (Sikhwari, 2008; WRDMP, 2011; Kahinda *et al.,* 2016). Lastly, the Roodeplaat and Pienaars Rivers flow from the south to north and turn to the west (CSIR Environmentek, 2001; Water Research Commission (WRC), 2001; van Bladeren *et al.,* 2007; van Averbeke *et al.,* 2011; Botai *et al.,* 2015). It is important to locate the flooding events to specific rivers and dams, since the tourist accommodation businesses might be closely situated to the water bodies.

The Waterberg region has attractive valleys that support farming, game ranching, nature reserves and resorts (Olivier *et al.,* 2008; Nelwamondo, 2009; Ladzani, 2010; Lyon, 2013). The region is enriched with thermal springs (Olivier, 2008; Olivier *et al.,* 2008; Boekstein, 2014). Most of the tourism activities in the region are nature-based including ecotourism-related activities, game farming, hunting and conservation projects (de Klerk, 2003; Boonzaaier, 2012; de Witt, 2012). The region is a popular tourist destination. Tourist facilities within the core and buffer zones of the region are essential for tourism development (Mafunzwaini and Hugo, 2005; Spenceley, 2006). Evidence shows that the region has shifted industries from agriculture to tourism (Sikhwari, 2008; Kahinda *et al.,* 2016). The winter months are relatively mild with about 286 sunlit days yearly, adding to the attractiveness of the destination (Lyon, 2013; Boonzaaier and Philip, 2007).

3.2.2. The Vhembe region

The Vhembe region of the Limpopo Province receives its name from the mountainous range stretching 130km from east to west (Nethavhani, 2007; Sikhwari, 2008; Aphane, 2011). An important geographical feature of the region forming the northern border of South Africa is the Limpopo River (Spenceley, 2006; Nelwamondo, 2009; Tshiala *et al.,* 2011). Figure 3.3 (below) presents the towns used in the Vhembe region. Makhado and Thohoyandou were chosen for this study due to the densely-located tourist accommodation consisting predominantly of hotels, lodges and guesthouses, bed & breakfasts and self-catering accommodation in the above-mentioned towns.

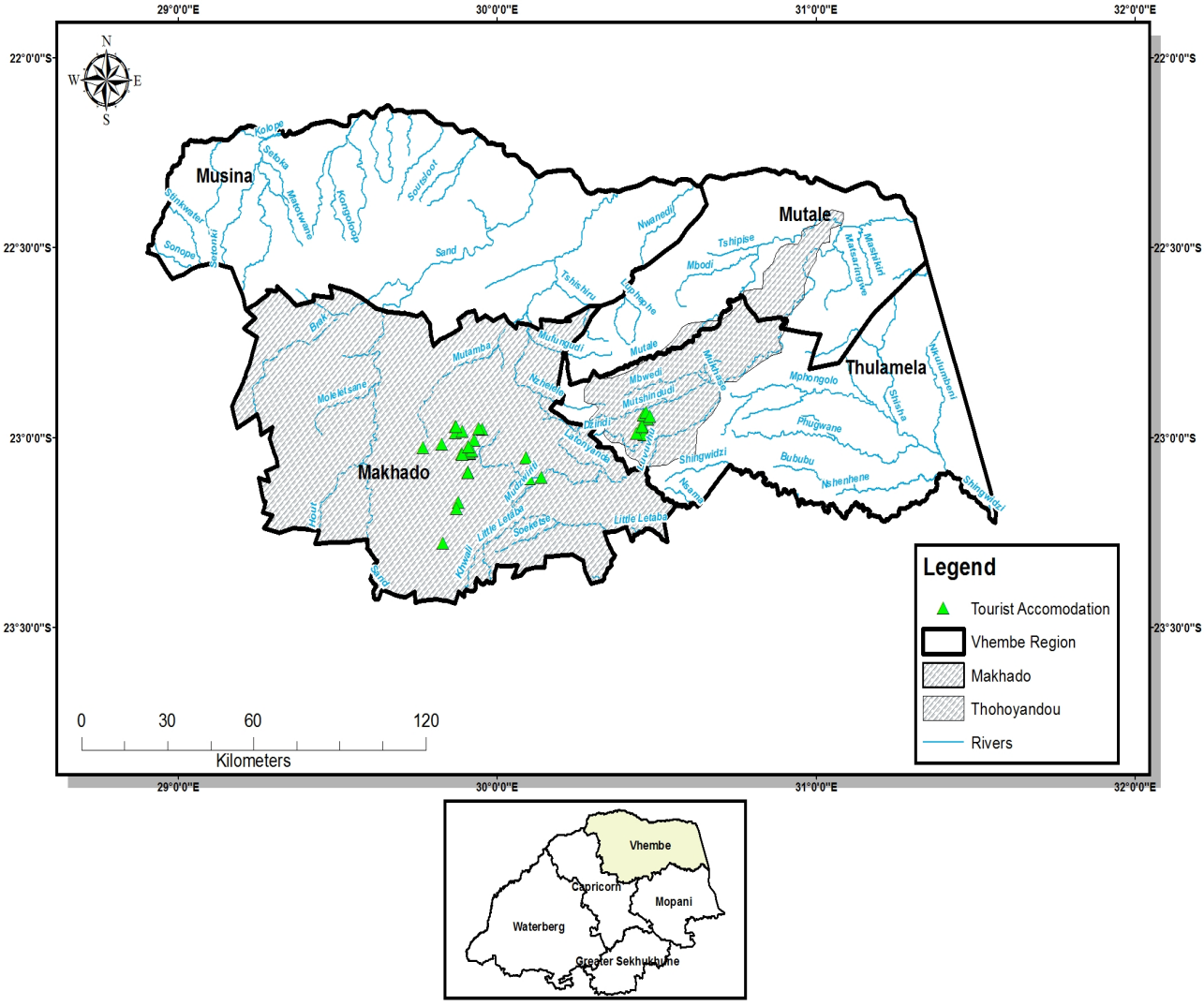

Figure 3.3: Tourist accommodation in the Vhembe region study site (Source: Researcher's Map, 2016).

The Vhembe region covers a total area of 754 727 km² (Nethavhani, 2007; Sikhwari, 2008; Aphane, 2011). The Vhembe region has a relatively limited supply of water with a few catchment areas forming the Limpopo River drainage basin (Reason *et al.,* 2005; Hart *et al.,* 2013; Mekiso *et al.,* 2013; Spaliviero *et al.,* 2014; Manhique *et al.,* 2015). These catchments receive water during floods (Manhique *et al.,* 2015). The Luvuvhu River and the Sterkstroom flow south of the Soutpansberg Mountains east of Makhado (Sikhwari, 2008; Aphane, 2011; Hart *et al.,* 2013; Manhique *et al.,* 2015). The Latonyanda, Dzindi, Mutshindudi and Mutale further flow eastwards as tributaries to join the Luvuvhu, all originating from within the mountain ranges and forest areas east of the Entabeni and Vondo (Sikhwari, 2008; Aphane, 2011; Hart *et al.,* 2013; Manhique *et al.,* 2015). The mountainous area has a summer rainfall average of 400 and 850mm of rainfall (Sikhwari, 2008; Aphane, 2011; Hart *et al.,* 2013; Manhique *et al.,* 2015). The region is prone to flood events and there are significant intra-seasonal variabilities with rainfall occurring through heavy thunderstorms or soft rain from October to March (Sikhwari, 2008; Aphane, 2011; Hart *et al.,* 2013; Manhique *et al.,* 2015). Easterly waves and lows, tropical cloud bands and associated thunderstorms produce most of the precipitation in the region (Holmgren *et al.,* 2003; Conelius *et al.,* 2009; Whitfield *et al.,* 2012; Hart *et al.,* 2013; Heritage *et al.,* 2014).

The Vhembe region is one of the Limpopo Province's emerging tourist destinations with a pristine natural environment (Nethavhani, 2007; Sikhwari, 2008; Aphane, 2011). The region has one of the most diverse natural, geological, archaeological and cultural systems in the world and history (Nethavhani, 2007; Sikhwari, 2008; Rogerson and van der Merwe, 2015). The region is characterised by bushveld, wildlife, birds and adventure opportunities (Spenceley, 2006; Nethavhani, 2007; Hamzah *et al.,* 2012). Tourism is becoming a driver of local economic development in the region (Mbedzi, 2011; Rogerson and Mthombeni, 2015). Many community-based tourism projects, other forms of tourism businesses, and tourism infrastructure are being constructed in the region (Boonzaaier and Philip, 2007).

3.2.3. The Mopani region

The Mopani region of the Limpopo Province is a Lowveld area with an unspoilt and conserved environment (Nelwamondo, 2009; Myer and de Crom, 2013; Fitchett *et al.,* 2016). Figure 3.4 (below) presents the region and the flood prone areas: the Greater Tzaneen and the Greater Letaba. Rivers in the Great Olifants River valley forms the southern border of the Province

(Ladzani, 2010). This region is a popular tourist destination since tourists from the Kruger National Park spend time in the region (Ladzani, 2010; Kruger and Saayman, 2014). The region includes tourist accommodation of all types. Various hotels, lodges, guest houses, bed & breakfasts and self-catering accommodation are located in the towns of Tzaneen and Haenertsburg.

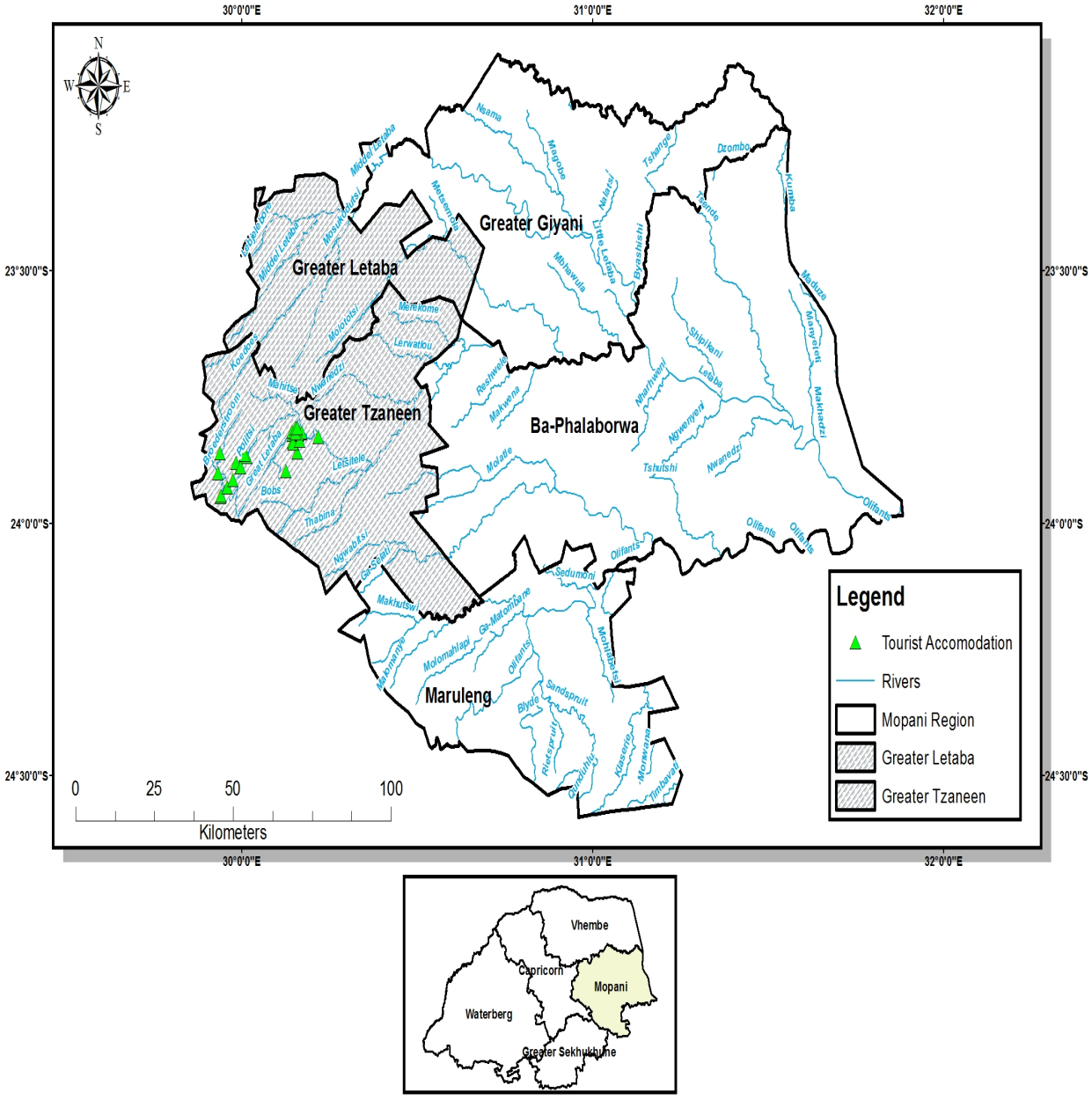

Figure 3.4: Tourist accommodation in the Mopani region study site (Source: Researcher's Map, 2016).

The Mopani region is known for experiencing flooding events (Fitchett *et al.,* 2016). The region has many rivers that flow through it with many tributaries and streams. The Letaba River has three additional streams namely: Greater Letaba, Middle Letaba and Klein Letaba with more than 20 dams located in the Greater Letaba catchment (Rowberry *et al.,* 2011; Kahinda *et al.,* 2016). The Molototsi and Nsama River form part of the Letaba system (CSIR Environmentek, 2001; Rowberry *et al.,* 2011; Kahinda *et al.,* 2016). There are a number of dams e.g. the Tzaneen, Ebenezer, Magoebaskloof, Nsami and Modjadji dams (Rowberry *et al.,* 2011; Kahinda *et al.,* 2016). Flood-prone mountain and foothill streams include the Letsitele, Thabina and the Debengeni Rivers (Rowberry *et al.,* 2011; Kahinda *et al.,* 2016). Flooding around these rivers and catchments are most widespread in Tzaneen, Modjadjieskloof, Giyani and Phalaborwa (DWA, 2001; Rowberry *et al.,* 2011; Kahinda *et al.,* 2016). The region receives summer rainfall up to 1400mm of rainfall per annum The summer precipitation reaches 425 and 850mm rainfall resulting in possible floods (Myer and de Crom, 2013; Fitchett *et al.,* 2016). The Limpopo Province receives up to 1400mm of rainfall per annum (Hart *et al.,* 2013; Myer and de Crom, 2013; Manhique *et al.,* 2015). The Mopani region is a tourism destination with different types of tourist activities (Hughes 2005; Mafunzwaini and Hugo, 2005). The region has developed in the last 20 years from an agriculture base to a tourism hub (Oyekale, 2005; Mbedzi, 2011; Kahinda *et al.,* 2016). Volunteer and youth tourism is emerging in the Mopani region (Lehto *et al.,* 2008; Rogerson, 2012). Tourism in the region provides opportunities for producers to generate additional incomes through tours, accommodation or directly with the tourist (Myer and de Crom, 2013). Nature-based tourism assists in achieving the tourism goal of increasing the visitor volume to the region (Kruger and Saayman, 2014).

3.3. The research design and methodology

This study has adopted a qualitative approach to explore the perceived flooding impacts on the tourism accommodation sector. The qualitative research tradition promises rigorous explorations of many important, but challenging issues researchers are interested in (Walker, 2006; Simon and Goes, 2011; Lichtman, 2013). For this study, "qualitative research can be defined as research being a situated activity that locates the observer in the world" (Denzin and Lincoln, 2005, 3). Quantitative research methods are difficult to reconcile within an interpretive approach, whereas, qualitative research methods provide considerable room for interpretive inquiry (Fereday and Muir-Cochrane, 2006; Guest *et al.,* 2012; Serafini *et al.,*

2015). Content analysis is used to assist in achieving the research aim to understand what the flooding impacts on tourist accommodation are from a management perspective. Since this study aims to explore the perception of flooding impacts, the study adopted a survey research design to include the different dimensions of the perceptions of flooding impacts on tourist accommodation businesses.

The research design describes the research sample size to understand why and how the research participants were selected. The section is followed by the ethical considerations and permissions for working with the research participants. The research instrument includes an online semi-structured questionnaire, telephone interviews and email responses that were used to collect data. The data were analysed making use of content analysis. Furthermore, content analysis is explained followed by the content analysis steps taken for this study. The content analysis coding led to the development of a structural codebook. The categorising of codes then assisted in developing inductive and deductive themes. Furthermore, the content analysis allowed for the reliability and validity of the themes. To conclude, a critical reflection of the applied methodology, data collection and content analysis limitations is explored.

3.4. The research sample size, strategy and sourcing

The sample population in this study includes a purposeful selection of a 145 tourist accommodation owners, managers and staff across the three regions. However, interest was only in the tourist accommodation affected by floods, close to water bodies and situated in flood prone areas. The Waterberg, Vhembe and Mopani regions are identified as areas where most of the Limpopo Province flood episodes occur. Researchers have to select their sources of information, define them and explain their importance (Duriau *et al.,* 2007). The sample gave access to a wide variety of accommodation in the three regions. The sample reflects the competitive nature of the different tourist accommodation and that the geography and location play an important role in attracting tourists. The sample included the different types, services and standards of the tourist accommodation businesses. A total of 145 tourist accommodation businesses were purposefully selected to participate in the study, since they were either vulnerable or exposed to flooding events.

An in-depth Google search was performed to identify whether the purposefully selected tourist accommodation was still operational and available to be research respondents. Tourist

accommodation websites were useful in collecting contact details and information. These websites included: the *Limpopo Tourism Agency, Bela Bela Tourism, Makhado Tourism* and *Tzaneen Tourism*. The majority of the accommodation was advertised in local district tourism booklets, pamphlets and magazines and the *Limpopo Tourist Accommodation Guide*. The information gathered on the establishments was useful to acquire knowledge of the different areas, accommodation products, services, and types of accommodation as well as ownership. Most of the purposefully selected tourist accommodation establishments appeared on promotion brochures, online tourist accommodation sites, online booking and accommodation specials and packages. For example: *Groupon, TripAdvisor, Booking.com, Safari, Getaway* and *Africa Tours* had 40% of the accommodation marketed on their platforms. Information was adapted from the National Department of Tourism, Limpopo Department Local Economic Development and Tourism (LEDT), Limpopo Department of Trade and Industry (DTI) to acquire background knowledge about tourism in the Limpopo Province to assist when analysing the data. The accommodation contacting and management details were recorded and saved on *Microsoft Excel* to send the online questionnaires.

3.4.1. Pilot study

Before the data were collected the researcher performed a pilot study to test the ability and limitations of the study. The pilot study tested the research collection instruments and allowed for the correction of any concerns. The researcher performed a primary Google search, collected tourist information brochures and visited the *Limpopo Tourism Agency* to identify all the tourist accommodation businesses across the three study regions. The researcher had identified 987 tourist accommodation businesses across the study regions. The researcher narrowed the research focus to selected tourist accommodation in and around flood-prone towns and areas. This allowed the researcher to purposefully select a 145-tourist accommodation sample size to participate in the study. The researcher piloted the online questionnaire with 15 tourist accommodation managers/owners and came across a few limitations. A few contact details of the accommodation were incorrect and the online questionnaire was delivered as spam emails to some managers/owner. The online questionnaire had to be amended since some questions were not clear and alternative response and communication options were requested. The researcher had to draft an email message

connected to the online questionnaire to first provide information about the study and the researcher whether they would like to be telephonically contacted. The anonymity of the respondents had to be maintained and the researcher had to send the emails individually to the accommodation managers/owners. Various managers/owners asked for the ethics certificate, consent form and research participation sheet and that was provided to them upon request via email. The researcher realised that the response rate was slow within the first three weeks and extended the data collection process from 11 February 2016 to 12 May 2016.

3.4.2. Ethics consideration and permission

A few ethical issues occur before and during the research process including: researcher and participant relationships, decision-making and kindness (Høgh *et al.,* 2001; Verd, 2010; Zhang, 2015). Research participants have to be approached in a friendly manner, and provided with a research participant information sheet (Omerov *et al.,* 2017; Verd, 2010). After gaining formal consent, the data collection process was explained to the participant (Omerov *et al.,* 2017). The researcher has to clearly state the type of research and the data collection instrument, to avoid participant confusion (Omerov *et al.,* 2017). The researcher further has to state if the name of the participant or respondent will be revealed (names and identity) or if the participant will remain anonymous and give reasoning for this, depending on the nature of the research (Omerov *et al.,* 2017). Researchers have to include data collection plans into their study, to use as a guideline based on experiences from previous studies (Verd, 2010; Robinson, 2014). The researcher has to inform the participants where data will be stored, for how long and under which security measures and provide reasoning (Verd, 2010). The researcher has to make the participants aware of any related publications available to the public (Omerov *et al.,* 2017).

The 145 tourist accommodation sample size was sent participant information sheets and a letter to gain consent via email. After gaining consent, the researcher emphasised anonymity, privacy and safe keeping of data under the rights of the institution. The respondents who agreed to participate in the study completed the online questionnaire. However, some respondents, who were not comfortable in answering the online questionnaire, were given alternative options either to email their responses or to be interviewed telephonically. The research data were collected from 11 February 2016 to 12 May 2016. Some accommodation managers waited for the heavy rainfall in the late summer of 2016 to participate in the study.

Ethical codes and concerns are not universal, but rather geographically sensitive to develop responses that are authentic in unique circumstances (Høgh *et al.,* 2001; Sainsbury and Weston, 2010; Verd, 2010; Zhang. 2015; Omerov *et al.,* 2017). The researcher has to apply at the institution for research ethics clearance to enable the researcher to undertake research (Verd 2010). The research application has to include and explain the proposed research, methods, the number of participants or respondents and the possibilities of risks and limitations (Zhang, 2015; Omerov *et al.,* 2017). The researcher has to indicate, whether the participants are medical (plants, animals for lab testing) or non-medical (human) respondents. An ethics number, code or protocol permission is granted to the researcher (Omerov *et al.,* 2017). An institutional ethical committee has to either approve or disapprove a research application (Omerov *et al.,* 2017).

Ethical clearance and guidelines allow the researcher to present protocol on how the participants were identified and participated in the research (Omerov *et al.,* 2017). Ethical clearances provide the researcher with evidence to guide data collection, participation, interventions and where more research is needed (Omerov *et al.,* 2017). Ethics permission was achieved through the institute, the University of the Witwatersrand to conduct the data collection processes under the ethics clearance number: H15/09/36 (*see Appendix A on page 157)*. Ethics include the analysis of post-research, to maintain the ethics (Zhang, 2015; Omerov *et al.,* 2017).

3.5. The research instrument for data collection

Qualitative research should at all times include a clear description of where, when and how the data were collected (Anderson, 2007; Watts, 2013; O'Brien *et al.,* 2014; Bengtsson, 2016). The researcher has to be reflexive in the presentation of questions to avoid biased responses (Coates, 2010; Bengtsson, 2016; Braun and Clarke, 2013). The research instrument included an online semi-structured questionnaire, and this could be followed by alternative email responses and telephone interviews if required.

3.5.1. The semi-structured online questionnaire

The research instrument used for the data collection process was a semi-structured, open-ended questionnaire. The questionnaires were created on Google online documents and saved as a survey document to be completed online via a link. The online questionnaire link was sent individually to tourist accommodation via email. The email included a brief introduction and purpose of the study, a consent form and the researcher's relevant details. If the accommodation management agreed to answer, they selected the online questionnaire link to answer the questions. A respondent progress bar indicated the survey progress and answers. Responses were recorded and saved on the researchers Google Drive folder. An advantage for the researcher was to date responses based on their answering progress, since the online system recorded every response from every respondent. The online questionnaire was constructed to include key questions linking back to the overall research question, aim, and objectives, to uncover relevant information regarding flooding impacts on tourism. The questions were first drafted via *Microsoft Word*, and converted to Google online documents. The questions further assisted in understanding the respondent's experiences, perceptions and contributions to flooding impacts on tourist accommodation businesses.

The online semi-structured questionnaire consisted of 24 questions (see attached *Appendix D on page 160*). All questions were specifically based on the perceived flooding impacts tourist accommodation faced or might face due to exposure and vulnerability to flooding episodes. One of the disadvantages of the use of questionnaires was that tourist accommodation management often had no time to answer all the questions. A total of 101 tourist accommodation managers and/or owners made use of the survey platform.

3.5.2. The telephone interviews

The telephonic interview (questioning process) was a shorter version of the online questionnaire. The telephone respondents were emailed two weeks after the online questionnaire was sent out to provide the necessary interview information to prepare and plan for the interview. Ten respondents were selected to be telephonically interviewed and had to answer the following questions:

1. what their understanding of tourism is in their area (i.e., included the surrounding environment of their establishment, the entire region/district or just specific parts if they wished to give reference to them)
2. what the weather is like during the summer months in their areas
3. if they have experienced a flood (i.e., personal, their establishment or whilst being in the area) and they had to provide a description of their experience, and
4. their understanding of flood vulnerability and flood adaptation was probed.

The respondents agreed on the dates and times, and confirmed their contact details to be telephonically interviewed. The telephonic interview process took place on the 12th of May 2016. All the 10 telephone interview calls were made between a three-hour time period (09:00am and 12:00pm). The researcher kept the telephone conversation under strict research rules and conduct. The respondents were contacted one after the other with calls ranging between four minutes to twelve minutes each. Notes were taken and important points were discussed and probed. The respondents were resourceful and elaborated on some points that were important or not clear. The responses were written down by the researcher, since permission was not granted to record the respondents for anonymous reasons.

3.5.3. The email responses

A total of eight respondents responded via email. The email process did not pose any problems, since respondents appreciated the flexibility afforded to them to respond. Email respondents, provided a summarised version of all the questions and answered in short paragraphs. Paragraphed responses were coded and included in the data analysis process. The researcher recorded and saved the responses on *Microsoft Word Excel* to be analysed together with the online questionnaires and email responses.

A disadvantage of qualitative research data collection is that more open-ended instruments are used in a more informal manner to allow for interaction between the researcher and respondent (Coates, 2010). Advances with the use of online data collection have created a technological flexibility that results in high response rates for research (Swanson *et al.,* 2015). The respondents were able to open their mail and complete the questionnaire at any given time and make amendments to their responses. Table 3.1 (below) presents the total of 119 respondents

who participated in the study out of 145 purposefully selected tourist accommodation managers. A total of 26 accommodation managers did not respond or participate in the study. This was due to the following reasons: changes of accommodation names and accommodation types; new or outdated websites with incorrect information/contact details and the closure of some accommodation businesses.

Table 3.1: An overview of the respondents who participated in the study through various platforms

Region	**Tourist accommodation type**	**Total number of respondents via different data collection tools**
Waterberg	Hotel Lodge Guest House Bed and Breakfast Self-catering Other	6 (online questionnaire responses) 10 (online questionnaire responses) 3 (online questionnaire responses) 8 (online questionnaire responses) 8 (online questionnaire responses) 3 (online questionnaire responses) 3 (direct email responses) 5 (telephone responses)
Vhembe	Hotel Lodge Guest House Bed and Breakfast Self-catering Other	8 (online questionnaire responses) 7 (online questionnaire responses) 4 (online questionnaire responses) 3 (online questionnaire responses) 5 (online questionnaire responses) 1 (online questionnaire response) 1 (direct email response) 1 (telephone response)
Mopani	Hotel Lodge Guest House Bed and Breakfast Self-catering Other	3 (online questionnaire responses) 11 (online questionnaire responses) 5 (online questionnaire responses) 3 (online questionnaire responses) 9 (online questionnaire responses) 4 (online questionnaire responses) 4 (direct email responses) 5 (telephone responses)
	TOTAL PARTICIPATING RESPONDENTS	**119**

(Source: Compiled from: Researcher's data collection, 2016).

Accommodation management responses ranged from information-rich structured answers to one word unstructured answers. The in-depth analysis of the results further allowed for the

inductive (new themes) and deductive (theory themes) to be placed in the relevant categories and codes into a codebook.

3.6. Content analysis for the collected data

Exploratory and interpretive research relies on the collected data from open-ended questionnaires, interviews and field notes, to allow for content analysis to be used in conjunction with experiences, emotions, behaviours and attitudes (Smith *et al.,* 1992; Anderson, 2007; Ruetzler *et al.,* 2014). Content analysis was employed to analyse the answered online questionnaires, emails and telephone calls. This approach involved organising and coding the data into themed or theory categories, to develop new concepts, the formulation of theoretical frameworks and content analysis flowcharts, definitions and relationships among concepts (Lombard *et al.,* 2002; Worthington and Whittaker, 2006; Kim and Kuljis, 2010). Recognised themes, concepts and patterns were addressed based on previous research and theories to establish simplification. The collected data that have been assigned to the same themes allow for a comparison of the flooding impacts on tourist accommodation establishments in each region. The collected data were used to clarify the meaning of the emerging themes and was able to recognise sub-themes and linkages between the themes.

Content analysis includes a coding scheme based on specific research questions and objectives determined from the literature reviewed (Lombard *et al.,* 2002; Verd, 2010). When content categories are established, it must contain homogenous data, according to the coding scheme (Janis, 1965). It then allows for the identification of data units to be categorised, compared reaching a conclusion (Collis and Hussy, 2003). Content analysis has previously proved successful in testing theories, analysing unexplained variations, and to render rich meanings from data (Harwood and Garry, 2003; Krippendorff, 2004a; Swanson *et al,* 2015). Content analysis is useful to determine the relative frequency and influences of trends, readability and changes in content (Vaismoradi *et al.,* 2013; Cho *et al.,* 2014).

3.6.1. Content analysis steps

Content analysis is seen as a priori (Walker, 2006; Vitouladiti 2014). This means a procedure developed for studies, grouped and derived from the research question. Content analysis leads

to a social distribution of perspectives on a phenomenon or a process (Harwood and Garry, 2003; Krippendorff, 2004b; Elo *et al.,* 2014; Bengtsson, 2016). The sampling is then oriented to groups of people whose perspectives on the issue seem to be more instructive for analysis (Harwood and Garry, 2003; Krippendorff, 2004a; Guest *et al.,* 2006; Guest *et al.,* 2012; Braun and Clarke, 2013). The data analysis method has to fit into the research process, including the research questions that focus on the analysis of a variety and distribution of perspectives on issues (Guest *et al.,* 2006). Content analysis can be applied at different levels of the data collection analyses, referring to the previous texts that would allow for the accurate capturing of the phenomena of interest (Harwood and Garry, 2003). The data has to be represented accurately through an iterative process of identifying themes and defining boundaries around those themes (coding or text segmentation). Themes can be classified into two categories, namely structural topics imposed by the research design and content or emergent themes describing what was observed or discussed in context of the research and data (Guest *et al.,* 2012; Braun and Clarke, 2013). Rereading the text will allow the analyst to identify relationship patterns of commonality and differences (Krippendorff and Bock, 2009). Once the analyst has defined themes, the text will be coded using defined concepts to allow for the themes to be refined and redefined (Xiang *et al.,* 2015). The text relationship should stem from the overall pattern of discourse and observation to identify the gaps and unexplored areas (Guest *et al.,* 2006; Guest *et al.,* 2012). Content analysis is mostly operationalised using manual coding techniques (Harwood and Garry, 2003; Krippendorff, 2004a; Guest *et al.,* 2012; Braun and Clarke, 2013).

Before the content analysis procedure starts, questions should be asked to ensure the successful application of the analysis. According to Krippendorff (1980), six questions should be addressed for the content analysis process:

1. Which data will be analysed?
2. How is the data defined?
3. What is the sample from which they are drawn?
4. What is the context relative to which the data will be analysed?
5. What are the boundaries of the analysis?
6. What is the target of the inferences?

The ability is to interpret the data as an important step for content analysis, since it reveals, contextualizes, paraphrases and summarises the original information (Guest *et al.,* 2012; Braun and Clarke, 2013). Saldana (2009, 139) defines a theme as "a phrase or sentence that identifies what a unit of data is about and what it means". A theme can be a theoretical construct where expressions are found in texts and images (Ryan and Bernard, 2003; Simon and Goes, 2011; Nasiri *et al.,* 2016). Some themes are broad and includes constructs that link many different kinds of expressions, and other themes can be narrow and focus on a specific kind of expression (Vaismoradi *et al.,* 2013). A very important analytical objective is to look for thematic cues such as; repetition, indigenous categories, metaphors, transitions, constant comparisons, similarities and differences and missing data (Krippendorff, 2004; Fereday and Muir-Cochrane, 2006).

For content analysis to be better understood in terms of any type of research type, the researcher created a flowchart to identify steps and ideas on how and why content analysis was chosen as a medium of data analysis. The flowchart of content analysis steps and ideas guides the research, the researcher and the reader to further understand how it assists in finding answers to an identified problem. Figure 3.5 (below) shows the researcher's flowchart to explain the methods and steps with content analysis.

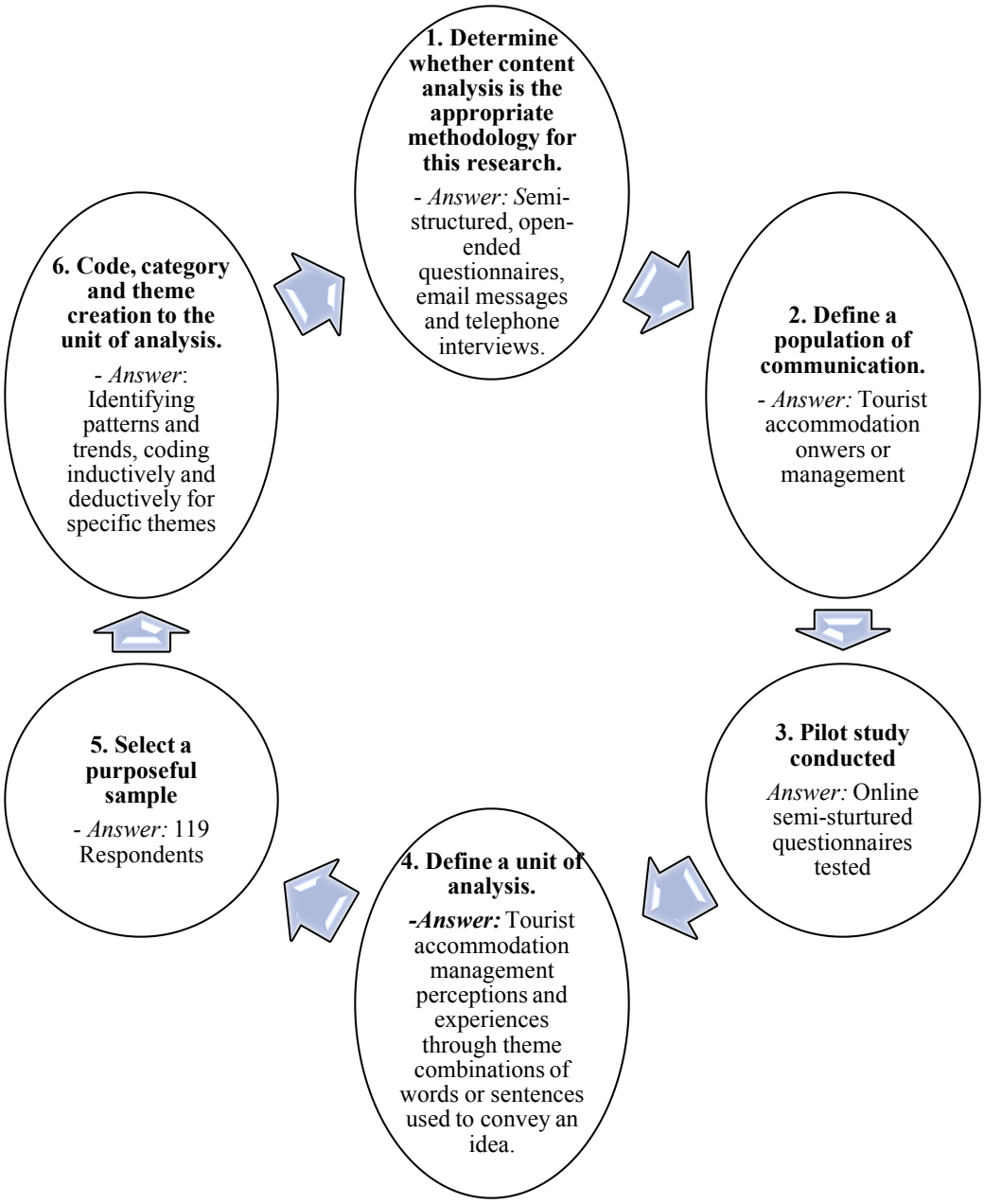

Figure 3.5: Content analysis flowchart to guide the research method (Source: Adapted from (Neuendorf, 2002).

3.6.1.1. Coding for content analysis

When coding for content, the data have to be reviewed to allow for valid and reliable approaches to group the content into specified levels of meanings and interpretation (Guest *et al.,* 2012; Braun and Clarke, 2013). Content analysis coding includes placing responses and explanations into similar, familiar, repetitive, unexpected and new interesting categories (Guest *et al.,* 2012; Braun and Clarke, 2013). Coding is important to constantly compare and contrast

phenomena, cases, themes and concepts (Watts, 2013). Codes assist in representing the information classified into specific categories through different units of meaning (Guest *et al.,* 2012; Braun and Clarke, 2013). Silverman (2016) has developed eight key questions to ask regularly and repeatedly once the data are sorted and ready for coding, to understand the information to be able to place it into categories. The eight coding questions are:

1. What (which phenomenon is mentioned)
2. Who (which persons, actors were involved, roles, interaction)
3. How (aspects of phenomenon mentioned and not mentioned)
4. When, how long and where (time, course and location)
5. How much, how strong (aspects of intensity)
6. Why (given or reconstructed reasons)
7. What for (with what intention, purpose)
8. By which (means, tactics and strategies)

Content codes should represent the content of the category to make reference to the theme it is allocated to and can be categorized through utilising labels and dimensions (i.e. making use of colour codes. Coding the content can also be done openly to assert detail and meaning of the information and coding can be applied line-by-line, question-by-question, sentence-by-sentence and paragraph-by-paragraph. Coding the content aims to break down and understand information and group it to create categories to be placed into themes (Silverman 2016).

3.6.1.2. Developing a codebook

After codes are broken down into logically organised sections the codes can be organised into an effective codebook to understand any thematically based, theoretical, hierarchal relationship, lineage, an order and groups into a set of themes (Krippendorff and Bock, 2009; Guest *et al.,* 2012; Xiang *et al.,* 2015). Structural codebooks are utilised as a basis for categories and themes that includes definitions with the main question included to enrich the response to the question (Boyatzis, 1998; Fereday and Muir-Cochrane, 2006; Guest *et al.,* 2012). Structural coding follows a structure and specific cues to start text segmentation and is mainly adopted from the questions and order of the questionnaire (Guest *et al.,* 2012). Guest *et al.,* (2012) assert that structural codebooks are useful when intending to successfully apply content

analysis to data. There are five parts when creating an effective structural codebook (Guest *et al.,* 2012). These parts are:

1. a brief definition that provides an idea of the code
2. a full definition of the code
3. a "when to use section" for specific instances based on data (where the code should be applied)
4. a "when not to use" section where the code should not be applied
5. an example section of quotes from the data that are good examples of the code

Table 3.2 (below) presents the structural codebook of this study including the questions asked in the questionnaire. The structural codebook was effectively used as a consistency matrix to match the questionnaire questions with the content (literature) and analysis. Codes are explained in detail in the reviewed literature with specific examples.

Table 3.2: A structural codebook for this study

Main Themes	**Sub- themes**	**Categories**	**Codes (code names, definitions)**
Flood Hazard Research Objective One	*Flooding Impacts*	Flood Risk/Hazard (Ques: 4, 5,13)	Rainfall, scale, intensity, frequency, climate change, environment.
		Direct Impacts (Ques: 14)	No, impacts, serious impact, physical, buildings, infrastructure, roads, doors, gates, fencing
		Indirect Impacts (Ques: 14)	No, impacts, serious impact, non-physical, humans, tourists, interest, bookings, profit, working shifts
		Damages (Ques: 14, 23)	Finances, costs, losses
Tourism Exposure Research Objective Two	*Tourism Demand*	Type of Tourist Accommodation (Ques: 1,2,3)	Hotel, lodge, guest house, bed & breakfast, self-catering, other
		Type of Tourists (Ques: 9)	Nature, adventure, eco, alternative, business
		Tourist Interest (Ques: 9)	Holiday, getaway, explore, experience, break, school holiday, work leave
		Tourist Bookings (Ques: 4,5,14)	Online, via telephone, travel agent, tour operator/consultant, establishment reception
		Tourist Accommodation Rates (Ques: 6,7,8, 22)	Per night, sharing, double, kids/adults, specials and promotions

		Tourist Length of Stay (Ques: 15)	Immediately leave, stay for a day or two, do not leave, curiosity, no transport
		Tourist Activities (Ques: 10)	Bush walks, hiking, golf, tennis, fishing, game drives, safari drives, hunting.
		Tourist Facilities (Ques: 11)	Conference rooms, restaurants, bars, swimming pools, braai areas, picnic areas, outdoor toilets, ATMs.
		Tourist Services (Ques: 12)	Cleaning, room service, ironing, telephone use, information, amenities.
		Tourist Safety and Security (Ques: 14, 15, 23)	Phobias, fear, questioning, evacuation.
		Tourist Postponement and Refunds (Ques:14,15,22,23)	New dates, peak/off-peak, cancelation policies and fees, immediate refund, cash or electronic.
Tourism Vulnerability Research Objective Three	*Tourism accommodation sector vulnerability to Floods*	Location/ Environment/ Geographical setting (Ques: 16, 17, 18)	Rainfall region, slope, uphill, floodplain, fauna, flora
		Tourist Accommodation (Ques: 1, 10,11,12,17,18)	Structure of building (way it was built), building material and durability, sandbags, water drainage systems.
		Near water bodies (Ques: 16, 18)	Main rivers, dams, streams, overflow, riverbanks, water activities
		Surrounding Communities (Ques: 18, 23)	High population numbers, more pollution, more pressure on environment.
Tourism Measures and Capabilities Research Objective Three	*Tourism accommodation sector adaptation and management*	Tourist Accommodation Adaptation (Ques: 19, 20)	Plans, policies, flood risk management, disaster planning, insurance, time, local government.
		Tourist Accommodation Management (Ques: 21,22,23)	Resilience, responses, recovery (costs), employment, salaries, services.
		Various ways for flood assessment (Ques: 14,17,20,21,22, 23)	Economic, environmental, socio-cultural, technological, legal and political views and measures
		Barriers to assessing flooding impacts (Ques: 14,17,19,20, 23)	Knowledge, education, training, funds, time, implementation, awareness, support
		Flood forecasting and modeling (Ques: 13,17,18,21,22, 23)	Media, flood information, climate maps, flood projections, weather (rainfall) maps, flood models, flood statistics and flood GIS

(Source: Compiled from: Researcher's data collection, 2016).

3.6.1.3. Categorising to develop themes for content analysis

The aim with coding is to reduce the material to define and categorise it (Fereday and Muir-Cochrane, 2006; Watts, 2013). Reducing the material assist in providing a direction in which the data should be interpreted (Fereday and Muir-Cochrane, 2006). Coding is a step of content analysis to remind the researcher that the information is received in different forms and from different origins and that the research question should contextualise the content (Guest *et al.,* 2012). Some questions may have common answers are misunderstood and are difficult to transcribe, interpret and discuss, but these questions should be included and coded to avoid poor text segmentation and the lack of the reviewed data quality (Guest *et al.,* 2012). These data are normally described as un-flagged poor data that eventually leads to the discovery of repeated responses in specific sections (Guest *et al.,* 2012). With emergent coding, categories are established following some preliminary examination of the data (Fereday and Muir-Cochrane, 2006).

During the coding and structural codebook development process, the researcher sorted and analyse the collected data vertically and horizontally. Vertical analysis includes reducing the collected data through two levels namely; summarising questions and answers text-by-text and later in point form to keep the significant information depended on the aim and objectives of the study (van Zyl, 2015). The horizontal analysis allows the researcher to compare and contrast the vertical analysis to identify recurring themes, ideas and answers (van Zyl, 2015). The analysis allowed the researcher to present comparative descriptions from emerging and new themes and refer to the literature to discuss the answers and keep the presence and significance of the information. The researcher's level of processing adopted a deductive and inductive approach to match the vertical and horizontal analysis for thematic coding. The deductive approach included identifying only relevant or significant answers that have been already classified (van Zyl, 2015). The inductive approach was a less detailed manner identifying answers that are recurring or that might be interesting or atypical (van Zyl, 2015). The reason inductive and deductive approaches were used is to compliment the literature review and increase the level of detail (background and foreground) (van Zyl, 2015). The benefit of this approach provided a constructive method for organizing the content according to flooding impacts prior to the application of the next level of tourist visitation data coding. Figure 3.6 (below) presents the final content analysis steps included for the results and discussion chapter:

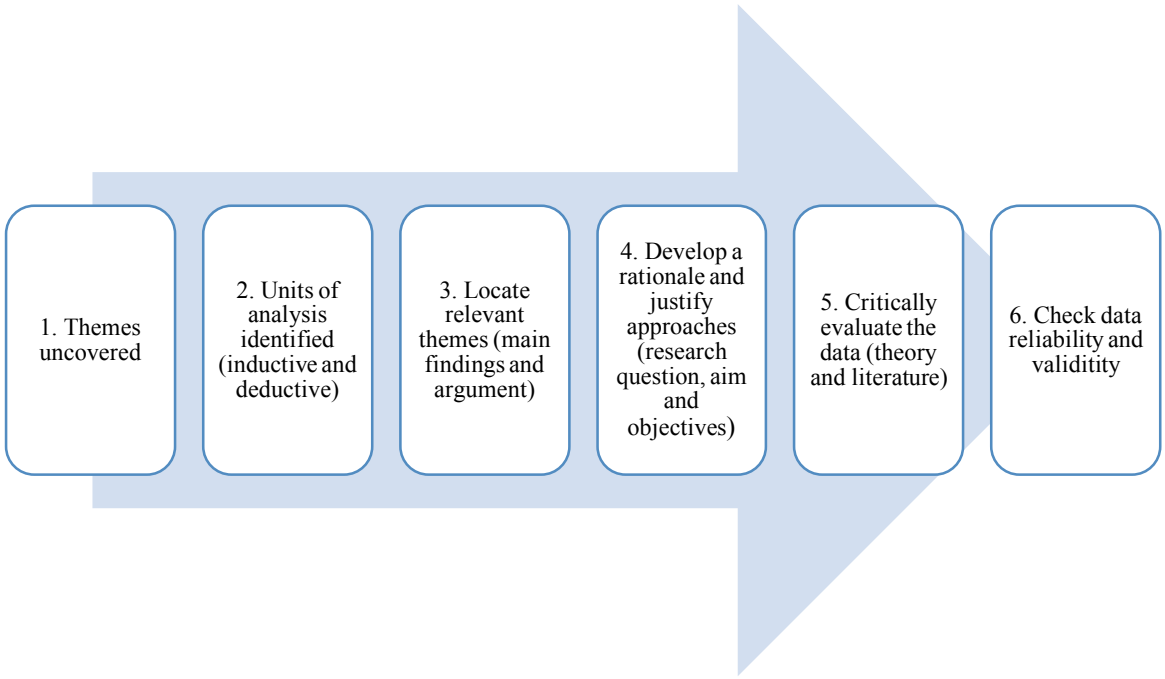

Figure 3.6: The researchers' final content analysis steps followed for the results and discussion

The content analysis steps allowed the researcher to first uncover the themes, to place the homogenous data into categories or into relevant themes. The second step identifies the units of analysis either through inductive or deductive theme selections. The third step located the research results into the relevant themes to develop arguments. Step four assisted in developing justifications to link the research findings with the research question, aim and objectives. Step five allowed for the critical evaluation of the data through the theory and literature. The last step, step six reviewed the data for reliability and validity. The reliability process included reading through the themes for stability, replication and accuracy from the theoretical framework.

3.6.2. Content analysis reliability and validity

Kolbe and Burnett (1991) suggest that if the mechanism or coding scheme is clearly identified, then theme categories become of prime importance since reliability is enhanced through the validity of data (Harwood and Garry, 2003). Systematic tests for reliability and validity were achieved with analysed data. Shapiro and Markoff (1997) assert that content analysis itself is only valid and meaningful to the extent that the results are related to other measures and are an exploration of the relationship between themes. Measures of reliability enhance the research findings and support the decisions by drawing inferences from themes (Harwood and Garry,

2003). Krippendorff (2004) has explained content analysis reliability through three forms: stability, replication, and accuracy. Furthermore, data should be duplicated under different circumstances to avoid inconsistencies and allow for comparisons to reproduce the accuracy of inter and intra reliability measures (Krippendorff, 2004; Serafini *et al.,* 2015). Weber (1990, 12) notes: "To make valid inferences from the text, it is important that the classification procedure be reliable in the sense of being consistent".

All methodologies include reliability and validity as the most fundamental issues associated with the application of content analysis (Harris, 2015; Serafini *et al.,* 2015). In general, reliability is easier to achieve once the analysis process has begun (Krippendorff, 2004). Validity is the extent to which the research may be generalised to the population (Duriau et al. 2007). This study made use of internal validity that referred to the classification scheme and categories as representing the research question and objectives. Before interpreting the results, the researcher had to re-check the information for validity (Guest *et al.,* 2012). This study has adopted two forms of validity; construct and predictive validity. Construct validity focuses on the accuracy of a theme to be measured empirically to represent a theoretical construct (Eisenhardt, 1989; Xiang *et al.,* 2015). Construct validity was validated if there was a convergence of two or more alternative codes and categories of the same theme. Predictive validity asserts that the results of the research correspond with the actual events or attributes whether, past, present or future (Eisenhardt, 1989; Xiang *et al.,* 2015). Predictive validity was validated through past, present and future perceptions of flooding impacts. It is important to recognise that a methodology is always employed in the service of a research question. As such, validation of the inferences made on the basis of data from one analytic approach demands the use of multiple sources of information (Eisenhardt, 1989; Xiang *et al.,* 2015). The researcher has a form of validation built into the design constantly linking it back to the content. In qualitative research, validation takes the form of triangulation (Krippendorff, 2004; Krippendorff and Bock, 2009; Mayring, 2014). The credibility can be tested with the findings by incorporating multiple sources of data, methods, investigators, or theories (Boyatzis, 1998; Elo *et al.,* 2014; Bengtsson, 2016;).

3.7. Methodology, data collection and content analysis limitations

With the means of exploring the perceived flooding on tourist accommodation establishments, not all five regions of the Limpopo Province and other flood prone areas could have been included, but based on flood occurrences, rainfall data, logistical issues and finances this was not possible. Intensive weather and flood data, models and analysis were not used for this study, since the focus was mainly on the perceived flooding impacts, experiences and responses from tourist accommodation establishments. Table 3.3 (below) shows the benefits and limitations of the application of content analysis. A summary of the most important benefits and limitations will assist in understanding the significance of why it was applied to this study. Content analysis can limit the researcher to the selective analysis of data, rather than exploring wider categories and themes from other related information (Braun and Clarke, 2013).

Table 3.3: A summary of the benefits and limitations of content analysis (Harwood and Garry, 2003)

Content analysis application benefits, strengths, advantages and positive factors	**Content analysis application limitations, weaknesses, disadvantages and negative factors.**
• Flexibility of research design (type of inferences) • Supplements multi-method analysis • Wide variety of analytical application • Can be utilised in either qualitative or quantitative studies • May be automated to improve reliability, reduce cost/time • Wide range of computer software developed • Copes with large quantities of data • Unobtrusive, unstructured and content sensitive • Development of standards applicable to specific research • Categories or themes are mainly developed from the text but are also received from the literature. • Finding evidence for certain categories to emphasise the importance and use it as an approach to reference the researcher's interpretation	• Analyses the communication (message/response) only • Findings may be questionable for verification • Underlying premise must be frequency related to themes • Reliability may be an issue • Replication and accuracy are not always allowed and clear • Validity can be construct and predictive • Less opportunity to pre-test, discuss mechanism with independent themes • Undue bias if only part data is analysed (context related) • Process is lengthy if done manually • Use of paraphrases replaces original text

(Source: Adapted from: Harwood and Garry, 2003; Krippendorff, 2004b; Guest *et al.,* 2006; Anderson, 2007; Kim and Kuljis, 2010; Guest *et al.,* 2012; Braun and Clarke, 2013; Vaismoradi *et al.,* 2013; Bengtsson, 2016)

3.8. Conclusion

The qualitative nature of the research process investigating the perceived flooding impacts on tourist accommodation allowed for relevant information collection from owners and/or managers through various data instruments. Content analysis enabled the coding, categorising and theme allocation to the research results and discussion. Content analysis is a powerful data reduction technique. Its major benefit includes that it is a systematic, replicable technique for compressing many words of text into fewer content categories based on explicit rules of coding. Content analysis assisted in keeping the content focused, efficient, rigorous and analytical. The following chapter discusses the results and explains the relevant and emergent themes leading to the main findings and arguments of the study.

4. CHAPTER 4: RESULTS AND DISCUSSION

"Busy streets turned into rivers,
Quiet homes made desolate,
Awful ruin, dire destruction.
Is the city's sad, sad fate." ~ George C. Rhoderick, Jr.

4.1. Introduction: Turning theory into practice through the measurement, analysis and assessment of flooding impacts on tourist accommodation businesses

This chapter presents and interprets the research findings. The data analysis of the results adhered to the theoretical framework to link the results back to the literature, theory and the relevant themes. The exploration of the flooding impacts on tourist accommodation created a focus on flooding experiences and challenges related to flood recovery, time, and costs. This chapter explores the impacts floods have on tourist accommodation. Tourist accommodation takes a long period to recover after floods and at the same time, it is costly to recover from floods. A total of 15 research themes were identified and analysed from the results. The research findings are presented, interpreted, and thematically discussed in the following content analysis themes:

- The perception of floods as a natural hazard by accommodation managers.
- What accommodation managers consider as direct flooding impacts.
- What accommodation managers consider as indirect flooding impacts.
- Accommodation managers' understanding on what exposes their accommodation to floods.
- The effect of floods on tourist accommodation special interests of tourists.
- The effect of floods on tourist accommodation bookings and value for money.
- The evacuation of tourists as a result of disrupted tourist length of stay during and after floods.
- The relationship between the star grading of tourist accommodation and the flooding impacts.
- The lack of knowledge of managers with regard to the vulnerability of their tourist accommodation.
- The flood vulnerability determined by the location of the tourist accommodation.

- The accommodation managers have no measures and abilities to handle floods.
- The need for flood risk management plans in the flood affected regions.
- Flood assessment and recovery challenges for tourist accommodation.
- Increased flood forecasting and information through flood mapping.
- The wider flooding impacts on the surrounding local communities.

The research results are presented and interpreted in graphs and tables, followed by an in-depth discussion of the findings and arguments. The research findings are analysed to link to the research aim and questions. Therefore, the primary aim of this study is to explore the perceived flooding impacts on tourist accommodation from a management perspective with the following research objectives:

- To explore the tourist accommodation managers' perception of changes in tourist reservations in an event of a flood.
- To determine if the tourists' length of stay is affected during flooding episodes.
- To critically evaluate whether there are adaptation plans for tourist accommodation vulnerable to floods.

To conclude, the research results and discussion chapter explores the main research findings and arguments to develop the theoretical and practical contribution of this research.

4.2. The perception of floods as a natural hazard by accommodation managers

Perceiving floods as a hazard differentiates between the flood risks and flood disaster (Kellens *et al.,* 2013). Floods are defined as a hazard with a high probability or chance for it to occur (Balica *et al.,* 2013). The perception of floods as a hazard are from the frequent responses from tourist accommodation managers. Most of the respondents described floods as being negative and a risk to their livelihood and business' success. Floods pose a risk to anyone before and during occurrence. Figure 4.1 (below) show how the accommodation managers perceive floods as a hazard through the frequency of floods in the Waterberg, Vhembe, and Mopani regions. The flood frequency was measured on a five point Likert scale with the following scales of

frequency: *never; rarely; occasionally, a moderate amount* and *a great dea*l. The use of the Likert scale assisted in quantifying the frequency of flood occurrence in the three regions.

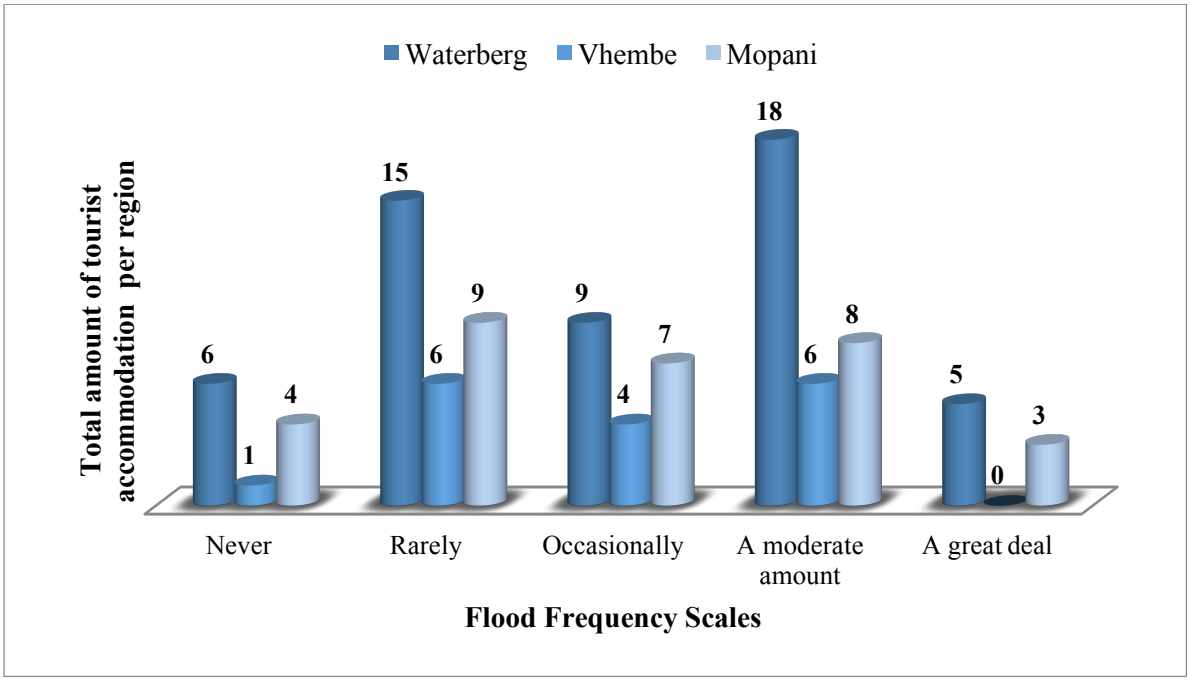

Figure 4.1: The frequency of floods in the regions Waterberg, Vhembe, and Mopani perceived by accommodation managers (Source: Compiled by researcher's results, 2016).

The Figure 4.1 (above) shows that six accommodation managers in the Waterberg region claimed that floods never occur in the region, with only one tourist accommodation managers in Vhembe and four in Mopani concurring that floods never took place there. The fact that across the three study regions only a total of 11 accommodation managers indicated that floods never occur might be newly built establishments who have not yet experienced floods. The managers of newly built tourist accommodation might lack flood awareness. A few direct quotes below provide evidence for this research finding.

> ***"I think floods are becoming a problem in the area and we might feel it in the long run as a privately-owned business."*** **(Self-catering Accommodation, Respondent 43, Questionnaire).**

> **"*Floods in the area might impact us in the future."* (Hotel, Respondent 67, Questionnaire).**

> ***"It can happen anytime. Changes in the weather and climate pattern cannot be controlled."*** **(Guest House, Respondent 96, Questionnaire).**

> ***"We win and we lose. We might be affected soon, who knows."*** **(Lodge, Respondent 98, Questionnaire).**

> ***"We recently moved to Bela-Bela to grow our business and we are not fully aware of floods in the area, since we opened last year."*** **(Bed & Breakfast, Respondent 111, Interview 10).**

Fifteen Waterberg accommodation managers indicated that floods rarely occur in the region, (six from Vhembe and nine accommodation managers from Mopani). A total of 30 accommodation managers indicated that floods are rarely frequent in their respective regions, (the Waterberg region had nine tourist accommodation managers, four from Vhembe, and seven from Mopani) claimed that floods are occasional in their regions. The occasional frequencies of floods identification from a total of 20 accommodation managers include floods that occur intermittently within 10 years. The Waterberg region had 18 accommodation managers confirming that floods occur on a moderate scale (six from the Vhembe region and eight from the Mopani region). A total of 30 tourist accommodation managers experience moderately frequent floods especially after heavy storms. Lastly, floods occurring a great deal across the three regions are minimal, with five establishments in Waterberg, none in Vhembe and three in Mopani. Only a total of eight accommodation managers confirmed that floods are frequently occurring almost every year or summer season and floods have become a challenge.

Frequent floods are recorded to be the most destructive and costly natural hazard based on local and global economy (Brody *et al.,* 2007). An increased flood frequency will influence tourist accommodation development and management to contribute to the local economy. Floods affect tourist accommodation products, services, natural setting, and location. Floods in South Africa have become a barrier for tourism development to boost the local community (Younus and Harvey, 2013). Based on previous studies, short-duration storms that may take place over a few days can easily increase the magnitude and occurrence of floods (Douglas *et al.,* 2008). Finally, identifying floods as a hazard rests on the responses from accommodation managers to understand the different perceived flooding experiences and impacts (Hamzah *et al.,* 2012; Cioccio and Michael, 2007; Sharpley, 2014; Ghaderi *et al.,* 2015).

4.3. What accommodation managers consider as direct flooding impacts

The direct flooding impacts on tourist accommodation include physical impacts on the buildings, environmental setting and the infrastructure (Merz *et al.,* 2010; Sharma and Franks, 2013). Direct impacts include floods damaging roads, gates, fences, doors, outdoor facilities and ground floor units or rooms (Velasco *et al.,* 2015). Table 4.1 (below) presents the tourist accommodation managers' experiences of direct flooding impacts. The experience differs because the accommodation may be built in different locations. The tourist accommodation managers listed and described their direct flooding impacts. Despite the difference in the type of tourist accommodation, managers listed similar flooding impacts. More than half of the tourist accommodation managers from hotels, lodges, and guesthouses across the three study regions were able to identify their direct flooding impacts. However, bed & breakfasts and self-catering accommodation managers were not sure what direct flooding impacts were for their establishment.

Table 4.1: Direct flooding impacts on tourist accommodation across the three regions

Tourist accommodation flooding impacts	**Direct flooding impacts**
Hotels	- Very little or no serious damages or direct impacts during floods to the hotel - Roads leading to the hotel damaged, hotel building damaged on ground floor and water supply polluted and damaged
Lodges	- Road networks washed away with damaged landscapes and safari tracks inaccessible - Lodge room damage, up to 12 rooms affected with damaged furniture, water activity products washed away 10kms from lodge and lodge kiosk supply covered in floodwaters. Other lodge facilities directly affected included spa venues being covered in mud, damaged gates, entrances, and fencing. Tourist parking lot, cars and personal belongings impacted with minor injuries to tourist - Wildlife and hunting game migration and deaths, horse riding, mountain biking and hiking tracks washed out, leading lodge to close down of the lodge and surrounding areas - Lodge golf course under water with damages to golf facilities
Guest House	- Rain that caused floods damaged the main building of the guest house, rain water accumulated in guest house rooms through damaged windows (trees collapsed through guest house windows and on facilities) - Past flooding impacts on the Guest house included damaged walls and the main gate. Floodwaters entered into the reception area and flooded parts of the garden, damaging the vegetable garden and trapped debris in swimming pools.
Bed & Breakfast	- Very minor direct impacts that affected the telecommunications

	- Floodwaters accumulated on the ground floor, damaging technological devices, wiring and reception area. Flooding affected the paint and the walkways to the bed & breakfast reception
Self-catering accommodation	- The replacement of self-catering units after being affected by floods - Floods directly affect self-catering units, since it includes outdoor and out in the veld accommodation and tourist activities. - Damaged caravan and camping sites, flooded offices, outdoor abolition facilities and parking areas flooded and covered with sediment - Broken down trees and outdoor structures during floods impacted guest rooms, picnic and braai spots. The mud used to build the huts was peeling off. - The wooden structures of the chalets were damaged and swollen due to the flooding and affected the electricity and heating facilities
Other	- Floods directly impacted our outdoor landscape and damaged the accommodation and services inventory, since store rooms were flooded and damaged machinery

(Source: Compiled by researcher's results, 2016).

The tourist accommodation will experience different types of direct flood impacts. Tourist accommodation businesses may experience either minor or major direct flooding impacts (Pang *et al.,* 2012; Sharma and Franks, 2013). Direct flooding impacts on the different accommodation types can become overwhelming with more challenges (Fatti and Patel 2013). Lodges, guest houses, and self-catering accommodation were badly affected with longer lists of flooding impacts compared with that of hotels and bed & breakfasts. Hotels and bed & breakfasts were moderately to minor affected by floods. Tourist accommodation face direct flooding impact challenges based on their type, location, and star grading. Hotels and some bed & breakfasts have a higher star grading than lodges and guest house, and have expensive packages, attractive amenities and are situated in business districts for specific target markets.

Hotels and bed & breakfast establishments have more working capital and profit turnovers cashed in from bookings, events, functions, and conferencing and thus make them more able to mitigate against floods. These types of establishments normally have funds for insurance, planning, and the recovery process after floods. Lodges, guest houses, self-catering and other types of accommodation are lower star-graded establishments not highly concentrated in the city centres and normally face direct flooding impact challenges. These establishments are affected by direct flooding impacts, since they are often located near large water bodies, in the open veld or adjacent to nature reserves and national parks. Thus, direct flooding impact identification draws on the distinction between accommodation types, services, and location, and the star grading. Indirect flooding impacts are more challenging to identify.

4.4. What accommodation managers consider as indirect flooding impacts

In the event of a flood, indirect flooding impacts are aggravated by direct impacts that can occur at any given time or location (Merz *et al.,* 2010). Indirect flooding impacts include the socio-cultural aspects of decisions, actions and plans (Mioc *et al.,* 2011; Ranger *et al.,* 2011). Indirect flooding impacts include the influence on management, repeat visits, the loss of products and services, and the local community. Indirect flooding impacts are the intangible aspects and actions based on the human ability (Guinea *et al.,* 2015). In this case, indirect flooding impacts on tourist accommodation are difficult to identify and assess. Table 4.2 (below) presents the identified indirect flooding impacts experienced by the tourist accommodation in the study sites.

Table 4.2: Indirect flooding impacts on tourist accommodation across the three regions

Tourist accommodation flooding impacts	**Indirect flooding impacts**
Hotels	- Little tourist interest due to floods in the area - No direct impacts, but are affected by the prolonged rainfall and it leads to indirect impacts influencing staff and online bookings - The change in perception and motivation of tourists once they are made aware of the floods taking place in the region and they were planning on visiting the hotel - No physical damages or impacts but a loss in business and poor service delivery from local government - Floods affect hotel functions, events, conferences and golf tournaments
Lodges	- Floods affected one lodge from a hospitality group and had an influence on all other associated lodges, with a knock-on effect, especially with the queries and bookings - Floods reduced tourists forcing tour operators and travel agents to cancel bookings. Floods affected business for intermediaries leading to wage complications (intermediary = travel agent, operator) - A flood event indirectly affected one lodge in a positive way, with an increase in bookings due to floods experienced in the town - The loss in booking forced the lodge management and marketing to create specials and packages for three months after floods - Floods influenced the cultural and heritage educational tours and experiences
Guest Houses	- A few minor indirect flooding impacts outside of the guest house, but it influenced the tourist activities, facilities and services - Not physically or directly affected by the past floods in the region, but based on the 2012 floods the business took a sharp decline in bookings and had to alter rates to accommodate guests, loss between 10-15% bookings both online/telephone and manually at reception. The guest house had to form a collective with other flood-affected tourist accommodation to start a movement towards mitigating and adapting to floods in the region

	- Guest house staff had to deal with guests who were in fear of the floods, and had to explain what the heavy rain and floods meant and at the same time had to calm them down. - Floods influenced the functionality of the guest house
Bed & Breakfasts	- The tourist accommodation experienced a slight drop in tourist numbers and bed-nights sold - Guests were doubting the accommodation after booking during floods - Floods threatened accommodation staff employment, business loss and profits and management was held accountable for guests' personal damages, safety and comfort
Self-catering accommodation	- Issues with water and electricity supply - There was a sharp decline in bookings and product offerings with key customers lost - Guest injuries during floods, due to high level waters
Other	- Floods affected water pipes and it lead to a 45% increase in the water usage statement

(Source: Compiled by researcher's results, 2016).

Floods indirectly threaten planned or current tourist activities at accommodation businesses (Gómez-Martín *et al.,* 2014). The majority of the tourist accommodation managers listed a loss in business, and a decline in bookings whilst no damages were recorded. The research findings suggest that indirect flooding impacts reflect the difficulty of assessing the indirect flooding impacts. The indirect flooding impacts create implications for repeat tourist visits. Further implications include problematic areas of service delivery, infrastructure, employment, wages and profits, injuries and safety, and evacuation procedures. The perceptions of indirect flooding impacts should be understood, since the impacts are place specific and accommodation management are best placed to observe the environment in which they operate (Wyss *et al.,* 2014). Due to the uncertainties of indirect flooding impacts, accommodation managers battle to gain a deeper understanding of their exposure to floods.

4.5. Accommodation managers' understanding on what exposes them to floods

Tourist accommodation management constantly confuses flood exposure with their flood vulnerability. Exposure to floods does not ask how vulnerable the business is to floods, but rather what exposes the business to floods (Yeo, 2003; Bernard and Cook, 2015; Klijn *et al.,* 2015). Half of the respondents listed their exposure to floods whilst listing the direct and indirect flooding impacts, but with no clear description of their exposure. The exposure to floods include the state of having no protection against floods and past experiences (Kundzewicz *et al.,* 2013). Hazardous floods and the identification of flooding impacts are useful parameters to assess tourism demand patterns (Hübner and Gössling, 2012; Gössling *et*

al., 2012). When identifying the indirect flooding impacts accommodation managers included the exposure to tourists, products and services, but did not include their tourism demand and supply strategies. Tourism demand is normally calculated using the tourist arrival numbers, tourist expenditure and bed nights spent (Hein *et al.,* 2009; Song *et al.,* 2012). The research finding includes the notion that flood exposure has created a competitive market among tourist accommodation. Tourist accommodation businesses not exposed to floods provide access for a large number of consumers and economic opportunities (Coshall and Charlesworth, 2011; Schubert *et al.,* 2011). The tourist accommodation exposure to floods may threaten the growing sector with negative results based on a competitive market (Few, 2003; Rossell and Santana-Gallego, 2014). A few direct quotes below provide evidence for this research finding.

> ***"The floods in Bela Bela have a negative effect on our bookings and guests book elsewhere."*** **(Guest House, Respondent 7, Questionnaire).**

> **"*Floods leave us un-operational in a highly competitive market."* (Lodge, Respondent 98, Questionnaire).**

> ***"Tourism is important for the economy, especially in our region, because it generates income."*** **(Lodge, Respondent 105, Interview 4).**

> ***"Flooding has affected tourism in a negative way, especially for the private business owners"*** **(Guest House, Respondent 107, Interview 6).**

4.6. The effect of floods on tourist accommodation catering for tourists with special interests

An accommodation target market can be either an individual tourist type or a group of tourists with similar motivations, purposes and interests to travel or consume a tourism product (Pang *et al.,* 2012; Rogerson, 2013a; Bernard and Cook, 2015). Special tourist groups with special interests, are target markets or tourism niches (Rogerson and Rogerson, 2014; Rogerson and Mthombeni, 2015). The majority of the tourist accommodation developing in the Limpopo Province include the BIG 5, game farms, cultural and historic settings. The type of tourists repeatedly visiting Limpopo are mainly, nature tourists, business tourists, adventure tourists,

cultural tourists, leisure tourists and backpackers. These tourists include both local and international tourists who seek a bush or nature experience. Almost 65% of the 119 establishments offered nature tourism products and experiences. A total of 39% (47 out of 119) of tourist accommodation managers had no clear tourist target market and catered for all types of tourists seeking different experiences. A total of 43% (51 out of 119) of tourist accommodation managers who were predominantly lodges, had interest from nature tourists. A total of 13% (15 out of 119) of tourist accommodation businesses targeted adventure tourists. A special interest provides good opportunities for business meetings and conferences in the Limpopo Province. Meeting and conferences take place at establishment conference facilities. A total of 23% (27 out of 119) of tourist accommodation businesses cater only for business tourists. Only 5% (six out of 119) of tourist accommodation businesses target both cultural and educational tourists. 6% (seven out of 119) of tourist accommodation specifically target leisure tourists. Lastly, the emergence of backpacker tourists is targeted at three 3% (three out of 119) of tourist accommodation businesses, predominantly for youth groups.

Understanding target markets will allow for the supply of products, services, and experiences to the interested group of people. International and many domestic tourists visit the accommodation on a specialised basis, either for game hunting, safari drives, angling, and adventures or for business purposes. Some tourist accommodation host events, functions, or conferences and attract many local tourists. These functions include weddings and celebrations; the events include golf tournaments and local concerts and the conferences include business meetings and workshops. Many tourist accommodation businesses cater for a variety of tourists, but the special interest niche for nature tourism in the Limpopo Province is at a lucrative phase, and are exposed to flood risks. A few direct quotes below provide evidence for this research finding.

> ***"We provide a wide variety of attractions and can tailor what we offer to any kind of tourist."*** **(Hotel, Respondent 35, Questionnaire).**

> ***"Tourists who are nature lovers and preference is given to nature tourists.*****" (Lodge, Respondent 44, Questionnaire).**

***"Different types of tourists knock on our accommodation, we open and welcome them."* (Guest House, Respondent 53, Questionnaire).**

***"It is difficult to answer this as our business forms part of a chain of various lodges in the Province, but the reserve targets both local and international guests and the reserve has been designed in a way which can accommodate all types of guests."* (Lodge, Respondent 54, Questionnaire).**

***"Mainly business tourists, because they usually come only for a few days and do not favor costly accommodation."* (Bed & Breakfast, Respondent 56, Questionnaire).**

***"All types of tourists who wish to make use of our services."* (Self-catering accommodation, Respondent 70, Questionnaire).**

***"Nature tourists, since the region is dominated by nature reserves and parks."* (Lodge, Respondent 71, Questionnaire).**

The identification of the tourist target markets for tourist accommodation are important for managers and require a strong marketing team to ensure that they meet tourists' needs. The marketing strategies and promotions have to be up to standard, to continuously inform the tourist about the product using various communication platforms (Michalkó *et al.,* 2015). Accommodation managers further indicated that they target other tourist types such as eco-tourists, sport tourists, avi-tourists (bird tourists), medical tourists, religious tourists, and day tourists (excursionists). The wide variety of tourist target markets demand different products and services at different times. Specific tourist target markets have complications with strangeness and familiarity (McKercher *et al.,* 2014).

Specialised tourists do not want to be removed from their environmental or travel bubble (Pang *et al.,* 2012; McKercher *et al.,* 2014). The environmental bubble links tourists to elements they are familiar with and keep them away from strange or unpleasant environments. These include familiar accommodation services from major hospitality groups, i.e. *Tsogo Sun*, *Protea Hotels*, *Radisson Hotels*, and *Forever Resorts*. Specific tourist target markets undergo efficient and effective booking and reservation procedures with assistance from travel agencies and global distribution systems (GDS). Once the flood news reaches the media, specialised and simplified

booking and reservation systems experience a change booking patterns and tourist interest during and after floods.

4.7. The effect of floods on tourist accommodation bookings

Floods alter the seasonal flow and patterns of tourist bookings and rates. Tourist bookings and rates have become one of the central findings of this research. The interested tourist loses out on time, value for money and experiences that is included in the booking. This section will explore the effect floods have on the accommodation bookings and rates, followed by the effect floods have on the average rates during peak and off-peak times for per person sharing per night. Tourist bookings are dependent on other variables of the accommodation such as services, rates, and tourist experiences. Figure 4.2 (below) represents the scale of flood effects on the accommodation bookings and rates measured using a five-point Likert scale with the following scales of frequency: *no effect; little effect; a moderate effect; a serious effect* and a *major effect*. The use of the Likert scale assisted in understanding the effect in terms of how important the floods were for the accommodation bookings and rates.

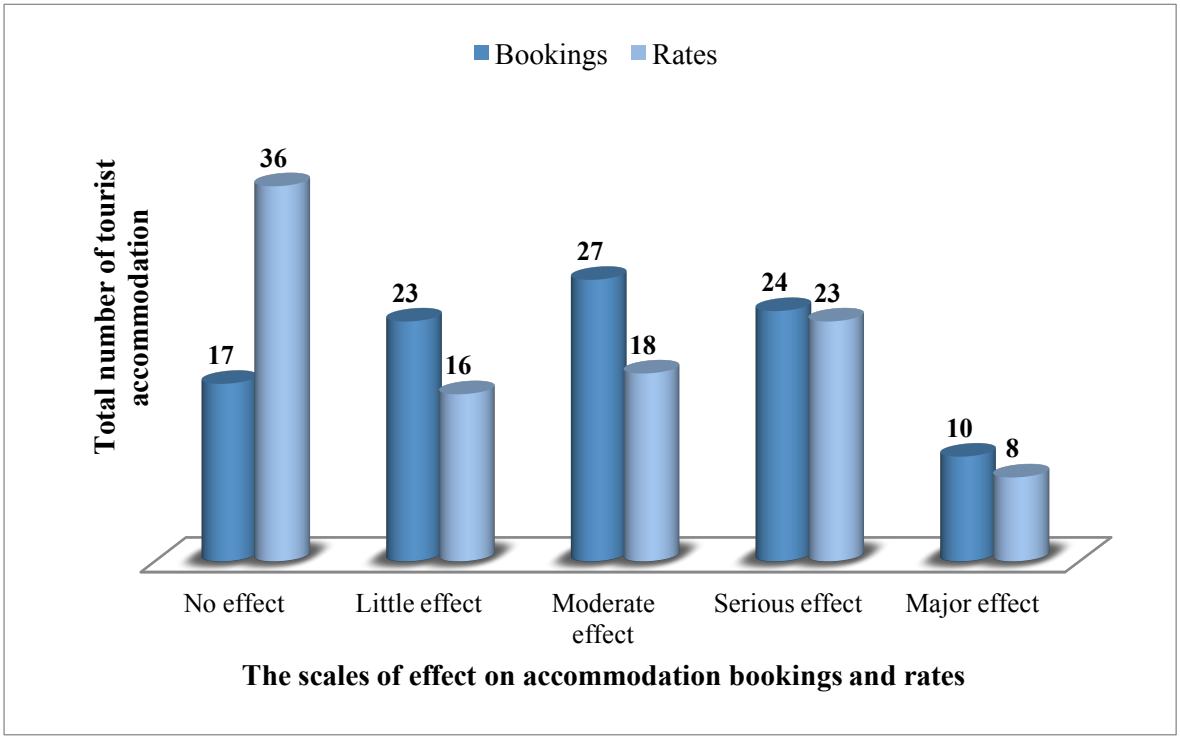

Figure 4.2: The effect of floods on accommodation bookings and rates in the Waterberg, Vhembe, and Mopani regions (Source: Compiled by researcher's results, 2016).

A total of 45% (53 out of 119) of tourist accommodation managers pointed out that floods have no effect on either their booking or their rates. Floods had a little effect on a total of 33% (39 out of 119) of tourist accommodation bookings and rates. Floods have a moderate effect on a total of 38% (45 out of 119) of tourist accommodation bookings and rates. For 39% (47 out of 119) of tourist accommodation had a serious effect on both their tourist bookings and rates. Lastly, a total of 15% (18 out of 119) of tourist accommodation received no bookings and floods had a major effect on the rates. Flooding events in the Limpopo Province may have numerous impacts and affect the booking patterns, systems and rates (Brody *et al.,* 2007; Fitchett *et al.,* 2016; Hoogendoorn and Fitchett, 2016). Once the floods affect the bookings and rates, there may be no income capital to ensure the full functionality of the accommodation. The majority of the tourist accommodation managers experienced *little*, *moderate*, and *serious effects* floods have on the accommodation bookings and rates. 85% of these tourist accommodation managers create packages, promotion deals, and specials during and after floods to increase the bookings. A few direct quotes below provide evidence for this research finding.

> ***"Guests decide to book elsewhere when there are flooding episodes in Bela Bela and the effect it has on our accommodation bookings are very negative."*** **(Guest House, Respondent 7, Questionnaire).**

> ***"Bookings drop between 10 and 15% once floods are announced in the region."*** **(Lodge, Respondent 9, Questionnaire).**

> ***"All types of bookings are affected. Online, telephone, physical and travel agents all included in assisting us book for our business. A sharp decline in bookings during a flood event and bookings are primarily cancelled due to the fear of floods, the heavy rain, and flood water levels. Guests have connected the worst flood outcome to their stay and experience at our lodge."*** **(Lodge, Respondent 44, Questionnaire).**

> ***"No serious effect or impact. Floods will occur in the area, but guest will still book, however, now and then we have to compromise on our accommodation standards, safety, and services."*** **(Guest House, Respondent 52, Questionnaire).**

"Not much really, these are outdoor guests and love whatever natural setting they come across. Yes, floods will be of great danger and risk, but as long as they can camp or park their caravans. We lose about 20 bookings per year due to the fear, possibilities and predictions of heavy rainfall in the area" **(Guest House, Respondent 53, Questionnaire).**

"There is a huge change and drop in booking numbers. We have to go as low as possible to reduce our rates to accommodate uncertain tourists. We need to prove that they will be safe and that their holiday and activities will not be affected. We work on eliminating the negative thoughts." **(Bed & Breakfast, Respondent 57, Questionnaire).**

"Floods do not have any effect on our bookings. Whether it floods or not, we do not experience any decline in bookings. We have created a platform where clients feel safe when natural disasters occur in our area. We are now perceived as an establishment that people can trust during times of distress and as a result, our bookings are not negatively impacted." **(Lodge, Respondent 89, Questionnaire).**

Floods affected tourists and establishments in the following ways: evacuation, a decline in tourist bookings and a loss in booking deposits. Evacuated guests were not permitted entrance into a few nature reserves during severe floods. Tourists made detours to their desired accommodation since the main roads were damaged and closed. Tourists missed their holiday time and some had to close during and after floods. The safety of tourists was a priority for most accommodation management. The sharp decline in bookings, altered the tourist demand and booking patterns. Accommodation managers highlighted the issue of booking deposit requirements and booking cancellation policies that affected the profit and working capital. The research findings indicate that the flood exposure and changes in accommodation bookings and rates were predominantly conveyed through the media, word of mouth by other tourists, and local messages regarding the flood risk.

4.7.1. The tourist accommodation booking and rates

The tourist accommodation rates should match the type of service, star grading and experiences offered to tourists (TGCSA, 2002; 2013). Determining accommodation rates rest on a variety

of factors (Rogerson, 2013). With this said, accommodation management determine their rates based on the products and services they offer, the location, the star grading, the level of activities and facilities (Nelwamondo, 2009; Rogerson, 2013a). Repeat visit tourists usually know about the type of accommodation and associated services. Accommodation aspects that influence the rates included breakfast (and other meals), 24-hour room service, room housekeeping, laundry services, luggage porters and carts and the convenience of other amenities in the area (Rogerson and Sims, 2012; Rogerson, 2013b). Planned trips and tours can include cheaper accommodation rates based on advanced booking, but some tourists make use of more expensive accommodation options, and floods affect these different rate options. The rates further differs based on the amount of nights booked and number of guests (Rogerson and Sims, 2012).

Figure 4.3 (below) indicates tourist accommodation rates per person sharing (double room), per night (p.p.s.p.n) in South African Rand (ZAR) during peak or off-peak season. The rates play an important role in differentiating between accommodation types and services. The average accommodation rates for both during peak and off-peak were calculated: the total rates divided by the number of similar accommodation types (e.g., R5 845 divided by six hotels = R 974.166 p.p.s.p.n off-peak season). Hotels were the highest priced accommodation with rates of R1 800 p.p.s.p.n during peak season and R975 p.p.s.p.n during off-peak seasons. Lodges charged R1 300 p.p.s.p.n during peak season and R745 p.p.s.p.n during off-peak seasons. Bed & Breakfasts were slightly cheaper than lodges with rates of R950 p.p.s.p.n during peak season and R550 p.p.s.p.n during off-peak seasons. Guest houses offered a night at R680 p.p.s.p.n during peak season and R480 p.p.s.p.n during off-peak seasons. Self-catering accommodation charged R400 p.p.s.p.n during the peak season and R250 p.p.s.p.n during off-peak seasons. Lastly, other accommodation types charged R280 p.p.s.p.n during peak season and R150 p.p.s.p.n during off-peak seasons.

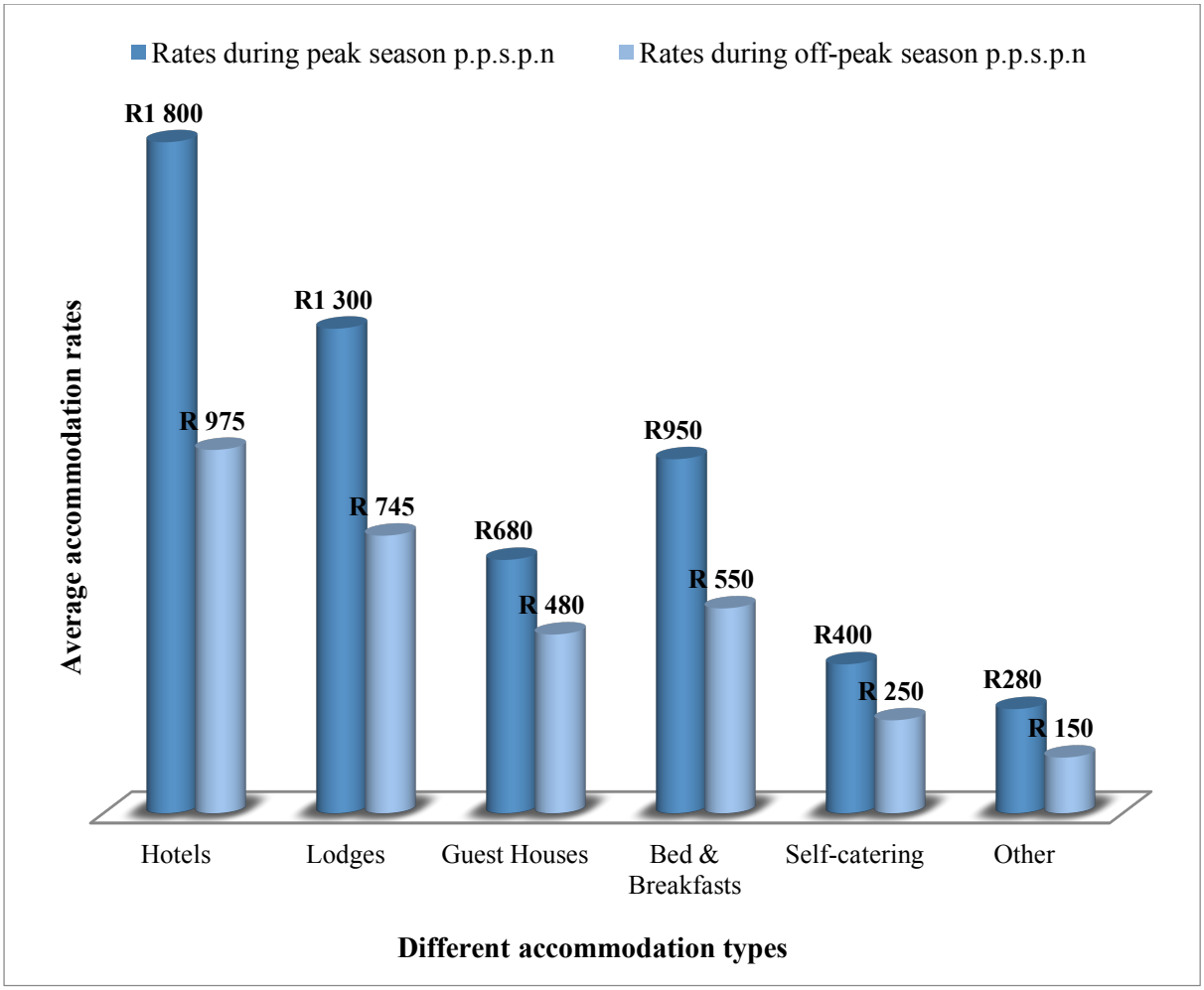

Figure 4.3: The average accommodation rates during peak and off-peak season for single or double rooms per night (Source: Compiled by researcher's results, 2016).

Currently in South Africa, the hospitality industry aims at charging lower and affordable rates for accommodation to enhance domestic travel, consumption and experiences (National Department of Tourism, 2011). There is a slight increase in rates charged to international tourists to increase the local income (Rogerson and Sims, 2012). The tourist accommodation rates are linked to the length of stay, related activities and expenditure, since some rates include packaged deals (Rogerson and Sims, 2012). Hotels are often the priciest and usually have between 50 and 120 rooms with quality bedrooms, services and are technologically advanced. Bed & breakfasts are attractive buildings that offer only a bed and breakfast in the morning, with less services and promotions. Lodges have between 50 and 100 rooms in game reserves and national parks, and charges tourists based on the amenities and packaged activities associated with the lodge i.e. safari drives, game hunting and hiking or walking trails. Guest houses are usually homes that have been converted into an accommodation with between six and fifteen rooms, bathrooms, a communal lounge area, and a dining area. Guest houses are

relatively small in comparison to the other accommodation types and are usually family-run with no additional expenses. Self-catering accommodation ranges from 20 to 40 stand-alone units, and includes a small fully equipped kitchen and lounge area. Lastly, other types of accommodation are not clearly defined and include affordable and accessible outdoor camping, caravans, hostels, rooms, and wooden cabins. No major accommodation services are provided for both self-catering and other accommodation types.

Tourist accommodation managers suggested that their peak seasons are between the months of September and March, whereas their off-peak season stretches from months April to August. The peak season is in summer and in favourable weather conditions. The research findings show that the peak seasons is high in tourist demand and bookings. Tourist packages are usually compiled during the off-peak season, ironically after the flood season to recover any losses from floods.

4.8. An immediate evacuation as a result of disrupted tourist length of stay during and after floods

Tourists make decisions to visit particular tourist destinations and accommodation, and these decisions define the length of stay and the duration of the tourist peak season (Bigano *et al.,* 2006; Dwyer *et al.,* 2009; Gössling *et al.,* 2012; Tol and Walsh, 2012). Tourists make accommodation bookings well in advance, but floods influence their length of stay, the quality of their experiences, and their safety. Tourist length of stay is the duration tourists spend at any accommodation type, whilst engaging in related activities and expenditure in the area (Bigano *et al.,* 2007; Kruger and Saayman, 2014). Current floods affect tourist services, facilities, products, and activities, thus influencing the length of stay. Shorter tourist length of stay compromises tourist risks and safety. Figure 4.4 (below) presents the tourist length of stay using four categories: *immediately leave*, *stay for a day or two, stay for more than three days* or *not bothered at all by the floods*. A total of 47 out of 119 tourist accommodation managers successfully responded to the tourist length of stay. A total of 56% of the tourists at 25 establishments immediately evacuated the premises without notice. A total of 10% of the tourists at five establishments stayed for a day or two during and after floods. A total of 16% of the tourists at eight establishments stayed for more than three days at the establishment after

floods. Lastly, 18% of tourists from nine establishments were not bothered by the floods and continued with their say.

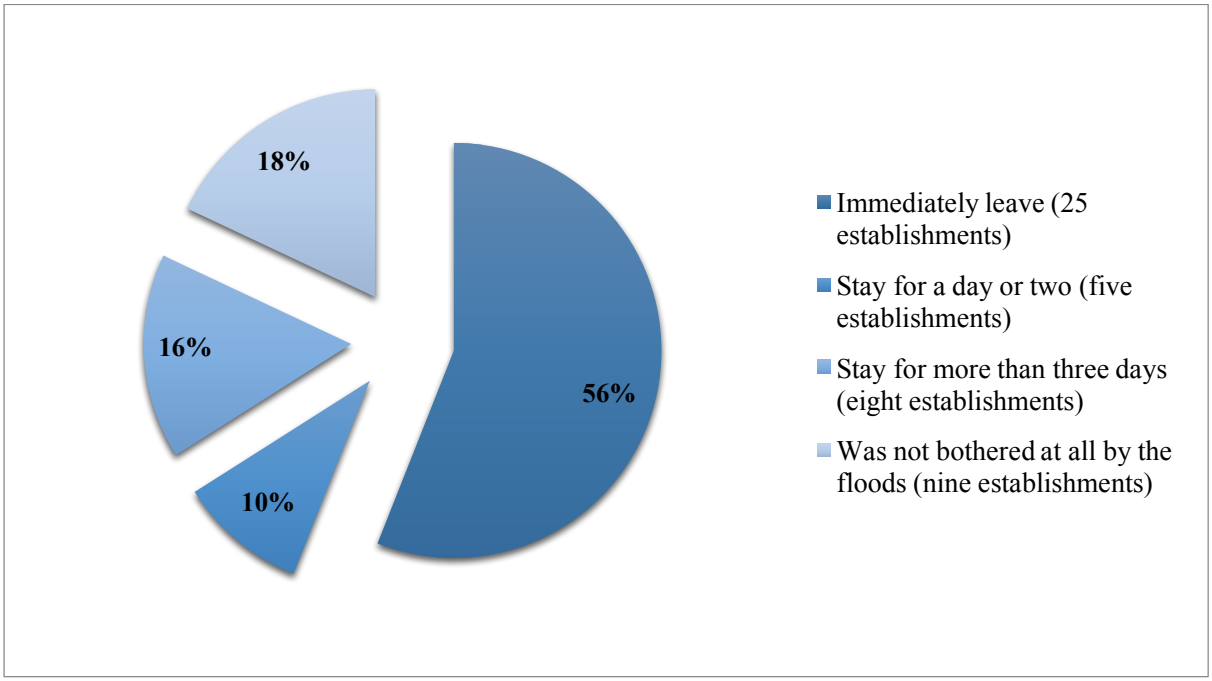

Figure 4.4: The influence floods have on tourist length of stay at tourist accommodation during and after floods (Source: Compiled by researcher's results, 2016).

It is important to analyse the tourist length of stay relative to the type of stay, accommodation type, motivation, behaviour and experiences (Goh, 2012; Becken, 2013a). Psychologically, tourists react quickly to events and changes, and their preferences can either destroy or promote the tourist destination (Park and Reisinger, 2010). The research finding shows that floods influence the tourist's consumption and behaviour and encourage tourists to cancel, postpone, or shorten their trips and depart. A few direct quotes below provide evidence for this research finding.

> ***"Very bad direct and indirect flooding influenced the B&B and guests immediately leave, cancel the rest of their stay and the business loses guests who usually book for the whole week if they attend business conferences in the area."*** **(Lodge, Respondent 39, Questionnaire).**

> ***"No evacuation points were established. No safety (or evacuation to higher ground). Tourists and staff called the police, ambulances, and fire fighters. Booking cancellation policies could not be applied and freak accidents took place."*** **(Lodge, Respondent 48, Questionnaire).**

"Tourist did not stay even a day and immediately packed up and fled for higher ground. They also wanted to get out of the area before roads were blocked and damaged completely for them to drive on. Tourists did not want to be trapped at the lodge till floods subside." **(Lodge, Respondent 51, Questionnaire).**

"The business slightly benefits because when other tourist accommodation is flooded around Thoyhandou, they come to us." (Guest House, Respondent 52, Questionnaire).

***"Drastic changes in tourist attitudes and behaviour. Tourists entered a level of fear and panic and they asked to leave immediately*."** **(Bed & Breakfast, Respondent 57, Questionnaire).**

"Tourists ask for cash back or to postpone their visits not to lose the money and ended up leaving." **(Lodge, Respondent 67, Questionnaire).**

"Guests opt to immediately leave. Floods threaten their lives, their belongings, and their safety. It makes the staff so emotional to see them leave." **(Self-catering accommodation, Respondent 81, Questionnaire).**

"Management had to convince guests to leave for their own safety and personal belongings, but most of them had travel insurance." **(Lodge, Respondent 83, Questionnaire).**

"It lessened the length of stay due to fear and the business lost good loyal customers in that period because we did not have any safety measures." **(Lodge, Respondent 86, Questionnaire).**

"There is a positive and negative influence. Guests leave or cancel bookings and the guest house receives or recovers them with guests who are in the area during floods and the accommodation they booked with is affected and impacted by floods." **(Guest House, Respondent 95, Questionnaire).**

"Flood affected or not, has an influence on tourist length of stay anywhere. Tourists would not want to stay in a place that is affected or in the area where floods occur." **(Guest House, Respondent 96, Questionnaire).**

It is evident that floods influence the tourist length of stay at tourist accommodation, and the reasons originate from a variety of psychological, behavioural, consumption, socio-cultural, and socio-economic factors. The tourist length of stay will further affect the tourist activities, facilities, and services which may not be utilised during and after floods.

4.9. The effect of floods on tourist accommodation star grading

Floods have a negative effect on tourist accommodation related activities, facilities and services and can result in the movement of tourist activities, and accommodation to other regions and different settings (Gasper *et al.,* 2011; Steyn and Spencer, 2012). Tourist accommodation targeting nature tourists will include safari drives and other facilities related to nature activities, facilities and services. Business, cultural, educational and leisure tourists would be interested in different tourist activities, facilities, and services for tourists. Tourist accommodation use their promotion and marketing strategies to focus on their related tourist activities, facilities and services (Rogerson, 2013). The tourist activities, facilities and services are the distinguishing factors of the different accommodation types (Nelwamondo, 2009; Rogerson, 2013b). Tourists appreciate it more when they are aware beforehand what the accommodation will entail and the value for money stay there will provide them. Table 4.3 (below) provides an overview of the different accommodation types and their associated tourist activities, facilities and services.

Table 4.3: Tourist accommodation types

Accommodation type	**Tourist activities**	**Tourist facilities**	**Tourist services**
Hotels	Tennis court, golf, indoor activities, helicopter rides, hot air ballooning, local tourist activities in town	Gym, swimming pool, business lounge, bar, restaurant, viewing decks	Room service, laundry, room telephone, housekeeping, Wi-Fi, ATM services, spa and fitness services, porter services, security services, post services, amenities, online booking with discounts, loyalty and rewards programs, car rental, 24-hour front desk
Lodges	Game/safari drives, bush walks, hunting, fishing, bird watching, hiking trails, boat cruise, water activities, observation and study of plants, birds, history and culture	Braai areas, play areas, bar, restaurant, dining hall, conference rooms, outdoor toilets, indoor fireplaces, built-in outdoor tables and chairs, kiosks/mini supermarkets, game room, swimming pool,	Educational tours, cultural tours, housekeeping, outside catering services, weddings and events, spa services, Wi-Fi in certain areas, car wash, guest report writing and feedback, function hire, golf tournaments, guard watch and patrol, welcome drinks, amenities, guided tours/safaris and safety kits
Guest Houses	Farming, gardening, painting, photography, sightseeing, cycling	Picnic spots, Jacuzzi, swimming pool, small farm with cattle and plantations, tennis courts, tree houses, guest lounge, garden with walkways and picnic areas	Offer picnic baskets at additional costs, weddings and events, free internet services with computers in reception area, pet friendly, amenities and DVD hire

Bed &Breakfasts	No activities	Swimming pool, mini bars and "catch-up" lounges, gym and parking	Standard full English breakfast, Wi-Fi, ATM's, vending machines, laundry and ironing and housekeeping and amenities
Self-catering accommodation	Mountain biking, trampolines, bungee-jumping, zip lining, quad-biking, bush sleep-outs and camping, stargazing, self-guided tours, team building, obstacle course	Swimming pool, outdoor abolition facilities, outdoor seating and tables, braai facilities, fire and boma areas, fully equipped self-catering units with kitchen, bathrooms and bedrooms, mini supermarkets and convenience shops	Boot camps, school camps and training camps, water and electricity in chalets or huts, meal packages, guard watch and patrol and amenities
Other	Local guided tourist tours and activities in town (close-by)	Swimming pool, tented camps, caravan camps, chalets, outdoor abolition facilities and braai areas	Information at reception and pet friendly

(Source: Compiled by researcher's results, 2016).

Table 4.4 (below) describes the star grading criteria of tourist accommodation in South Africa. Hotels have the highest rank and most expensive activities, facilities, and services. Lodges include a wider variety of outdoor tourist activities, facilities, and services. Guest houses provide less facilities and services and a few tourists activities. Bed & breakfasts are not tourist-activity orientated and include only a few tourist facilities and services. Self–catering accommodation and other undefined types of accommodation include a small number of tourist activities, a wide variety of tourist facilities, and paid services such as game drives. Majority of tourist accommodation services included tourist tours as a tourist activity, swimming pools as an ideal facility, and Wi-Fi and ATM's have become preferred service.

Table 4.4: Understanding the star grading of tourist accommodation.

Tourism Grading Council of South Africa (TGCSA) Grading Criteria
 **Five Star: Outstanding** You will find the most outstanding quality and luxurious accommodation matching the best international standard of furnishings, service and guest care. Breakfast is guaranteed to encompass all tastes, be served all day and include seated and in-room dining. Room service can be ordered 24 hours a day.
 **Four Star: Excellent** You can expect an excellent quality of the overall standard of facilities, furnishings, service and guest care. Enjoy a full breakfast over an extended period and have the option of being served at your own table. Room service should be available at least 18 hours of every day and all rooms should have a work area that includes a desk.
 **Three Star: Very Good** You should receive a very good quality in the overall standard of facilities, service and guest care. You should also be able to order just about anything for breakfast.
 **Two Star: Good** You'll find a good quality in the overall standard of facilities, furnishings and guest care. Expect breakfast with at least some hot food and hand towels, bath towels and soap in the bathrooms.
 **One Star: Acceptable** There is an acceptable basic quality in the overall standard of furnishings, service and guest care. You should also be entitled to an adequate breakfast and soap and bath towels in the bathroom.

(Source: Adapted from: http://www.tourismgrading.co.za/ March, 2017).

4.10. The managers' lack of knowledge of their accommodation vulnerability to floods

The vulnerability of tourist accommodation across the three study regions include the knowledge and understanding of what the flood vulnerability aspects include. The accommodation flood vulnerability are in most cases confused with flood exposure, since the two terms are used interchangeably and either increase or decrease the risk (Few, 2003; Fekete, 2009; Becken *et al.,* 2014; Clar and Steurer, 2014). Accommodation flood vulnerability is important. Vulnerability links to geographical, environmental, economic, and socio-cultural factors. The heterogeneous accommodation types and services have an influence on the accommodation's vulnerability to floods (Guizzardi and Bernini, 2012; Rogerson and Sims, 2012; Su *et al.,* 2012; Rogerson, 2013a; Njoroge, 2014; Becken *et al.,* 2014). The vulnerability to floods can include the proximity to waterbodies, and on floodplains and in heavy rainfall areas with poor drainage systems. Table 4.5 (below) describes the tourist accommodation flood vulnerability per region. To know and understand flood vulnerability requires information about the changing climate and weather, and the location. A total of 58% (27 out of 46) of the accommodation managers knew and understood their flood vulnerability in the Waterberg region. A total of 13% (four out of 30) of the tourist accommodation managers knew and understood their flood vulnerability in the Vhembe region. Lastly, a total of 29% (13 out of 43) of the tourist accommodation managers knew and understood their flood vulnerability in the Mopani region.

Table 4.5: The knowledge and understanding of accommodation vulnerability per study region

Tourist accommodation flood vulnerability in region	**% of accommodation managers who understand their vulnerability to floods**
Waterberg	58% know and understand their vulnerability
Vhembe	13% know and understand their vulnerability
Mopani	29% know and understand their vulnerability

(Source: Compiled by researcher's results, 2016).

In total, 37% (44 out of 119) of the accommodation managers know and understand their vulnerability. However, 63% (75 out of 119) of accommodation the managers do not know or understand what is meant by flood vulnerability. 63% of the accommodation managers raise a concern about the distribution of information about floods in the regions. Furthermore, this

means that 75 establishments operating in flood-prone regions are not aware of the flood vulnerability dimensions and factors. Literature suggests that many methods and models can be used to measure the vulnerability of tourist accommodation establishments to flooding episodes (Cohen, 2007; Balica *et al.,* 2013; Bernard and Cook, 2015). The flood vulnerability from any tourism manager's perspective can be more than one-dimensional, since various explanations stem from what they perceive makes the business vulnerable (Çetinsöz and Ege, 2013; Becken *et al.,* 2014; Espiner and Becken, 2014). The research finding suggests that 44 accommodation managers determined their flood vulnerability through their location and geographical setting.

4.10.1. The flood vulnerability determined by the location of the tourist accommodation

The measurement of tourist accommodation flood vulnerability per region included a five-point Likert scale: i.e. *not at all; slightly; somewhat; very* and *extremely* vulnerable to floods. The location and geographic setting of the accommodation serves as a basis for managers to understand the flood vulnerability. The geographic vulnerability dimensions include the landscape, the physical environment and other geographical elements of the area (Jonkman *et al.,* 2008; Mondlane, 2010; Sharma and Franks, 2013; Windle and Rolfe, 2013). The GPS coordinates of the tourist accommodation provided accurate locations across the three regions. The accommodation location include surroundings that can create high or low levels of vulnerabilities to floods (Hall *et al.,* 2005; Nicholls *et al.,* 2007; Werritty *et al.,* 2007; Spaliviero *et al.,* 2014). After the knowledge and dimensions of accommodation flood vulnerabilities are identified, accommodation managers could measure their vulnerability using various scales. Figure 4.5 (below) presents the tourist accommodation flood vulnerability per region utilising the five-point Likert scale. In the Waterberg region, a total of 13 establishments were *not* vulnerable at all to floods, nine were *slightly* vulnerable, seven were *somewhat* vulnerable, 11 were *very* vulnerable, and 10 were *extremely* vulnerable to floods. In the Vhembe region, a total of four establishments were *not* vulnerable at all to floods, three were *slightly* vulnerable, three were *somewhat* vulnerable, four were *very* vulnerable, and one was *extremely* vulnerable to floods. In the Mopani region, a total of 11 establishments were *not* vulnerable at all to floods, seven were *slightly* vulnerable, four were *somewhat* vulnerable, eight were *very* vulnerable, and six were *extremely* vulnerable to floods.

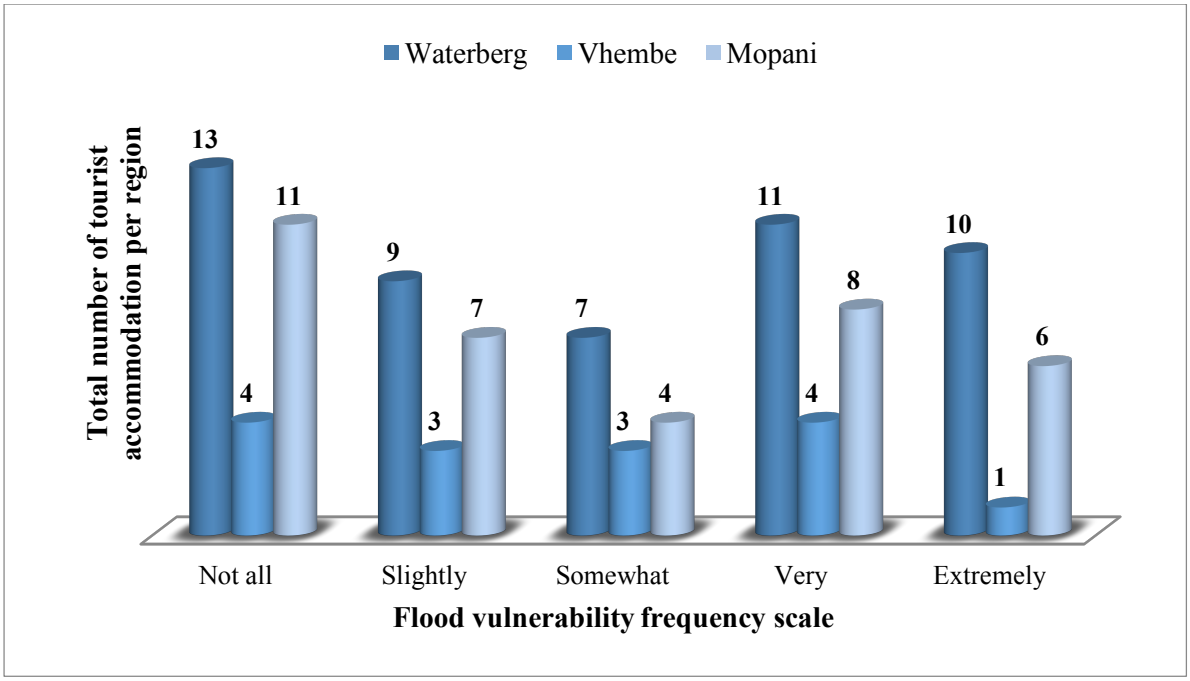

Figure 4.5: The vulnerability of tourist accommodation to floods per region (Source: Compiled by researcher's results, 2016).

The identification and understanding of adequate adaptation plans to prevent the tourist accommodation from future losses based on their vulnerability is a key process for establishment managers. Accommodation flood vulnerability includes many pre-determined factors such as the location and the weather (Few, 2003; Hall et al., 2005; Oyekale, 2005; Coates, 2010). In addition, being surrounded by rivers, dams, lakes, and streams increase their flood vulnerability. Rivers and dams exceed their limit once rainwater exceeds the riverbanks or dam walls. Tourist accommodation situated in floodplains undergo the most direct and indirect flooding affects, risks, threats, and damages. A few lodges indicated that they are situated on the 100-year flood line. The vulnerability scale provided the accommodation management with a guideline to determine their vulnerability, but the majority chose to respond in a descriptive manner. Disclosing the flood vulnerability scale and level was viewed as protected information for some tourist management who were unwilling to share their thoughts on their vulnerability to floods. Furthermore, some accommodation management did not want to share such information for fear that information would be openly available to the media. A few direct quotes below provide evidence for this research finding.

"Less people booked due to media reports." **(Hotel, Respondent 45, Questionnaire).**

"Tourists were scared to leave due to not knowing what is happening out there and the news coverage had spread." **(Hotel, Respondent 46, Questionnaire).**

"*Negative impact due to media and society perspective on flood risk areas*." (Self-catering accommodation, Respondent 62, Questionnaire).

"Negative feedback from flooding events in the area reaches our guest house information base including websites, social media and other advertising platforms. This led to communication links turning sour and no bookings are recorded." **(Guest House, Respondent 75, Questionnaire).**

"We are indirectly exposed to floods because of the stigma that people have when a certain area is flooded. People do not come to the area once they hear about the flood news." **(Lodge, Respondent 86, Questionnaire).**

More than 15% of the tourist accommodation mangers stated that they are not entirely sure what is meant by flood vulnerability and how to measure or determine it. The research findings show that a few accommodation managers indicated that flooding either affected their business in a negative or positive way. Anyone could be a victim to flooding impacts across the three study regions.

4.11. The accommodation managers ability to handle floods

Relating back to theory, tourist accommodation should be able to measure and adapt to the impacts, damages, and business losses. Possible flood measures should ensure adequate adaptation plans and the lessening of future flood risks. Being able to mitigate and adapt to any flooding impacts involve the careful measurement of exposure, vulnerability, and adaptation to floods. Effective flood measures should first identify all the possible scales, units and methods to measure the amount, level or intensity of the flooding impacts and to categorise and analyse the flooding impacts (Crichton, 2002; Kundzewicz and Menzel, 2005; Mustafa, 2005; Atta-ur-Rahman and Khan 2011; Buchecker *et al.,* 2013; Balica *et al.,* 2013; Birkholz *et al.,* 2014; Filatova, 2014; Woodward *et al.,* 2014; Klijn *et al.,* 2015). The research finding indicates that almost 56% of the tourist accommodation managers do not have the ability to

cope with the consequences of floods and do not have useful measures and plans e.g. correctly identifying, evaluating and assessing the flooding impacts. A few direct quotes below provide evidence for this research finding.

> ***"We had to cancel some bookings and activities due to the limited capacity and resources."*** **(Self-catering accommodation, Respondent 43, Questionnaire).**

> ***"Could not recover, closed the place down and planning something else or to sell it."*** **(Guest House, Respondent 80, Questionnaire).**

> ***"When the establishment experienced a flood, we usually close down our establishment until we have the correct actions in place. We prefer to not get any bookings for that period."*** **(Guest House, Respondent 88, Questionnaire).**

> ***"We had to close down the business until everything was sorted out."*** **(Lodge, Respondent 93, Questionnaire).**

Flood management capabilities include the resources and materials to be able to effectively and efficiently mitigate and adapt to flooding impacts (Scawthorn *et al.,* 2006; Woodward *et al.,* 2014; Thiemig *et al.,* 2015). Tourist accommodation managers have different flood adaptation measures and capacities. Their accommodation adaptation measures included recovery and adaptation processes through sandbags, the building of walls and walk/pathways, drainage systems, and evacuation points.

4.12. The need for flood risk management plans in the flood-affected regions.

Flood risk management plans are strategies and approaches to better manage current flooding impacts for earlier and faster responses, resilience and recovery (Yeo, 2003; de Bruijn, 2004; Buchecker *et al.,* 2013; Kellens *et al.,* 2013; Filatova, 2014). The importance of having flood risk management plans in place during and after floods are key managerial tasks the tourist accommodation managers should perform. Without flood risk management plans, tourist accommodation can lose business which could lead to the eventual shutdown of business (Van Der Veen and Logtmeijer, 2005; Benjamin, 2008; Merz *et al.,* 2010; Méndez-Lázaro *et al.,*

2014). Managers need flood risk management plans, since Figure 4.6 (below) shows that 69% (74 out of 119) of establishments *do not have* flood risk management plans. A total of 31% (33 out of 119) of establishments *do have* flood risk management plans.

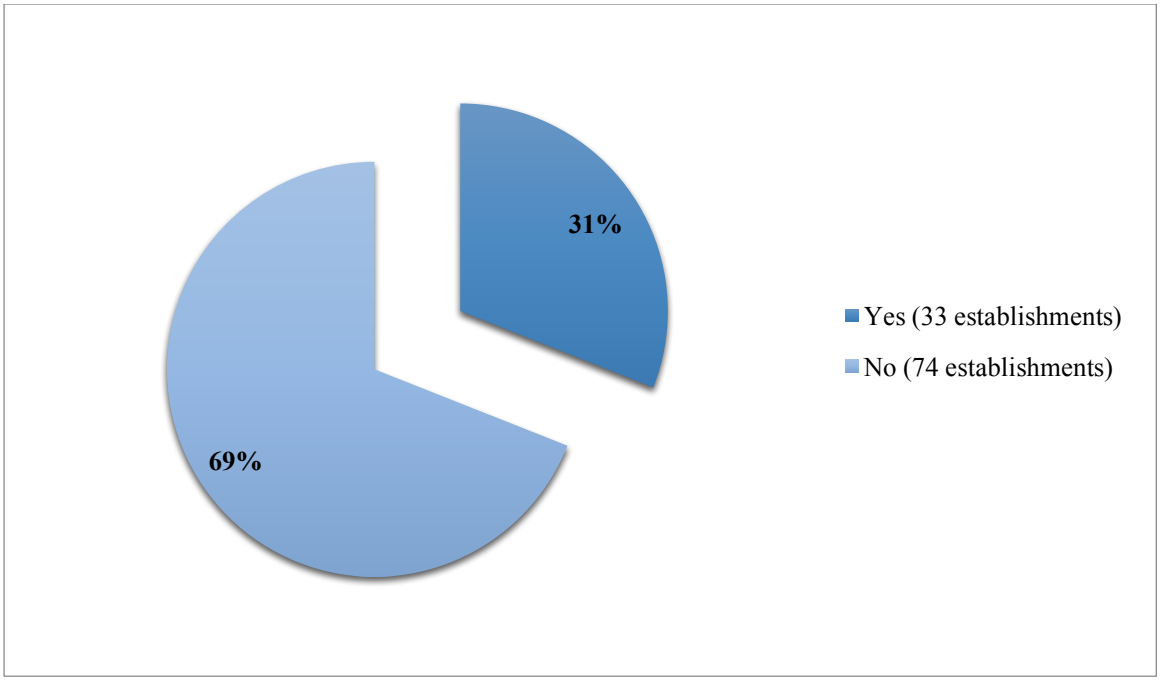

Figure 4.6: The indication of flood risk management plans for tourist accommodation across the study regions (Source: Compiled by researcher's results, 2016).

The research finding indicates that establishment flood risk management plans are challenging managerial tasks that require compiling reports, applying the correct measures, finding both time and finances. Flood risk management plans are seen as a luxury for some tourism businesses (Wilby and Keenan, 2012; Filatova, 2014; Kind *et al.,* 2014). The lack of implementation of flood risk management plans for establishments are due to a shortage of funds, time, and staff, and the fact that organisations and/or government are involved. Establishment managers indicated that local government and municipalities should provide the guidelines for flood risk management plans and assist flood affected businesses with basic services. In Ireland and Scotland, the local municipality and government recognised the importance of doing research on the floods and associated damages, and it has led to the policy generation of flood risk management plans after disastrous floods (The Office of Public Works of Ireland, 2009; Scottish Parliament 2009; Mondlane, 2010; Honert and McAneney, 2011). These policies are usually reported and amended by the local municipality to reach national government and the constitution to enforce flood risk management as an Act (The Office of

Public Works of Ireland, 2009; Scottish Parliament 2009; Mondlane, 2010; Honert and McAneney, 2011). Currently flood risk management policies and plans for the Limpopo local government need revision. Tourist accommodation in flood-prone areas face flood assessment barriers and responsibilities, and effective plans and measuring tools are required to assess, calculate, evaluate, and recover flood damages.

4.13. Flood assessment and recovery challenges for tourist accommodation managers

For the past two decades, researchers; policy makers; and environmentalists have faced a challenging task when applying the correct methods and materials to measure flooding impacts, since the variety of methods are countless. Flooding impacts, either direct or indirect are understood to be best assessed and analysed in economic terms (Chandler, 2004; Balica *et al.,* 2013; Fitchett and Hoogendoorn, 2016). To understand the purpose, context and type of the tourist accommodation, economic evaluation of flood impacts provide the rationale for economic values affected during floods (Brown 2006; Merz *et al.,* 2010). Other methods aside from economic methods to measure the flooding impacts on tourist accommodation can be utilised, such as environmental evaluation, catchment analyses and damage scales. The evaluation and assessment of environmental, socio-cultural, and legal aspects of flooding impacts highlight the different scales and levels of impacts.

4.13.1. The responsibility of flood risk management plans

Floods can occur at any time and therefore it is necessary to have a flood risk management plan. Flood risk management plans for tourist accommodation are useful measurement tools especially after a flood event. Figure 4.7 (below) indicates that 51% (61 out of 119) of managers stated that they (the accommodation management) should take full responsibility of the flood risk management plans. A total of 17% (20 out of 119) of managers stated that the accommodation owner should take the responsibility of implementing the flood risk management plan. A total of 16% (19 out of 119) of managers blamed the local government/municipality for not taking responsibility for the flood risk management plan's implementation. A total of 10% (12 out of 119) of managers mentioned that flood risk

management plans are the responsibilities of other stakeholders involved in the investment and operations of the tourist accommodation. Lastly, 6% (seven out of 119) of managers were not sure whose responsibility it is for setting up flood risk management plans.

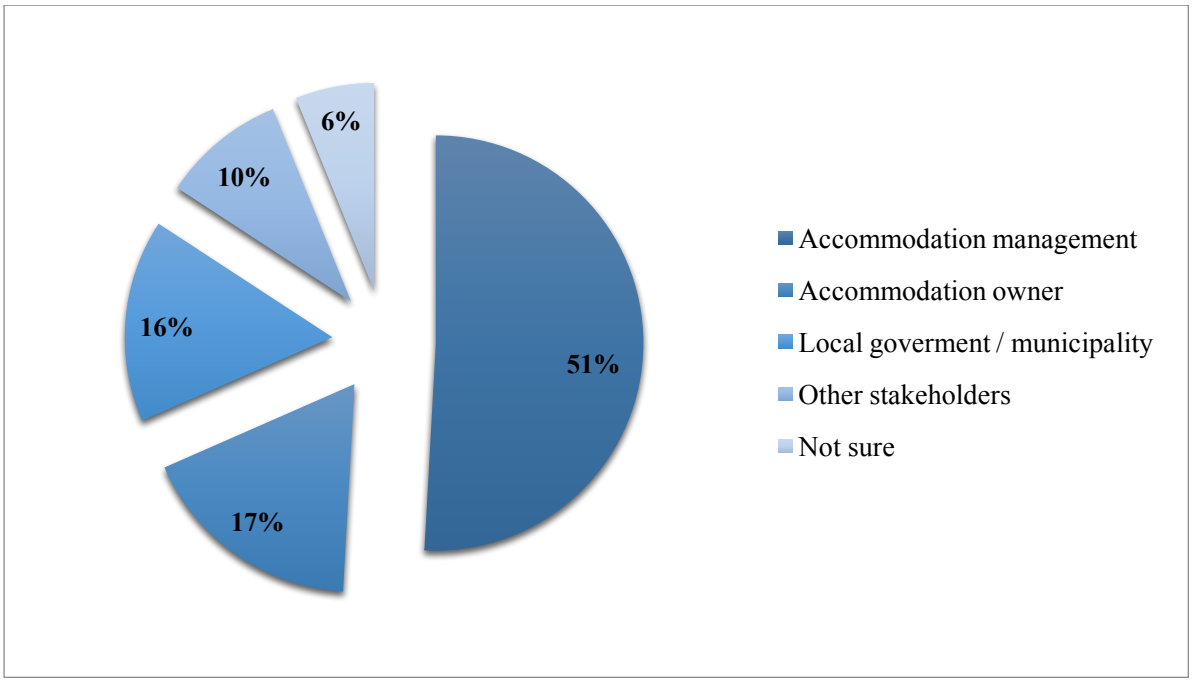

Figure 4.7: The responsibility of accommodation flood risk management plans (Source: Compiled by researcher's results, 2016).

A total of 61 out of 119 tourist accommodation managers acknowledged that it was the managements' responsibility to implement flood risk management plans, however only 33 out of the 61 tourist accommodation managers indicated that they have flood risk management plans. The remaining 27 tourist accommodation managers probably came to the realisation that they should have flood risk management plans and take responsibility for the flooding impacts A strong emphasis is placed on accommodation owners, stakeholders, and investors to assist in taking the responsibility to ensure flood risk management plans for establishments. A few direct quotes below provide evidence for this research finding.

> ***"It is the responsibility of the establishment to provide or create a flood risk management plan. We have an evacuation plan and procedure, but it's not sufficient for flood risks, damages, costs and recovery."*** **(Lodge, Respondent 94, Questionnaire).**

"In the event of floods a lot of management, operational and emotional issues need to be taken into consideration, because flood damages are bad." **(Guest House, Respondent 107, Interview 6).**

"What hindered us the most was the loss in business and funds to re-generate our business." **(Lodge, Respondent 108, Interview 7).**

"We had no flood risk insurance or management plan and the recovery was bad for us." **(Lodge, Respondent 110, Interview 9).**

The research finding indicates that the responsibility to set up and implement flood risk management plans by accommodation managers is not a priority. Flood risk management plans can safeguard the business after flood events. A total of 19 accommodation managers suggested that the National Department of Tourism should have an updated disaster risk management plan for local tourist accommodation to use as a guideline. Higher star graded accommodation: hotels, lodges, and bed & breakfasts usually have a risk analysis team to draft and implement flood risk management plans, and to complete the flooding assessment and evaluation process. Lower star graded accommodation rely on profits, donations, and local government compensation to assist in recovering and adapting to flood consequences. Only a few accommodation managers state that they have effective evacuation plans and procedures, but they agree that these are not sufficient for flooding impacts, costs, and recovery.

4.13.2. Tourist accommodation flood assessments

Accommodation managers stated that flood risk management plans assist in the evaluation and assessment of flooding impacts. Tourist accommodation have diverse flood risk management plans that allow for different assessment procedures. Various flooding impact assessments include numerous tools, methods, procedures, and measures to reach an assessment outcome. The research finding indicates that the majority of the tourist accommodation managers did not know that there are various ways of identifying and assessing flooding impacts. A few accommodation managers understand the distinction between direct and indirect floods. Direct and indirect flooding impacts on accommodation businesses can be further assessed and evaluated through a series of time scales (Merz *et al.,* 2010; Ranger *et al.,* 2011). So, when

assessing flooding impacts based on scales of time, accommodation management focus on the time (days, months, years) it takes to recover from experienced flooding impacts. The recovery period is assessed in short, medium, and long-term scales. The measurement and assessment of flooding impacts can be temporal or spatial in order to understand all the affected elements in the region where the accommodation business operates (Booij, 2005; Amelung *et al.,* 2007; Rowberry *et al.,* 2011). Flooding impacts on tourist accommodation require time to be assessed, and depending on the flood assessment scale, the flood recovery process can be prolonged.

4.13.3. Challenges with the flood recovery process of tourist accommodation businesses

Tourist accommodation managers indicated that being impacted by a flood will result in a lengthy recovery because not only does recovery include costs, but business operational time. Any flood damages to property involve recovery costs. Business flood recovery requires time and financial planning to include all the necessary recovery approaches (de Bruijn, 2004; Hamzah *et al.,* 2012; Bernard and Cook, 2015; Hegger *et al.,* 2016). Table 4.6 (below) summarises and categorised the flood recovery process for the accommodation, and it provides an estimated recovery cost range for the flood recovery period. Hotels can take up to two months to recover from floods with recovery costs ranging between R80 000 – R600 000, whereas a lodge can take up to one year with expenses ranging between R65 000 and R760 000. Both guest houses and B&B can take up to three months with recovery costs ranging between R10000 and R30 000 to R150 000 and R250 000. Self-catering accommodation can take between two to eight months to recover with expenses ranging between R75 000 to R430 000. Lastly, other types of tourist accommodation that are not clearly defined or established can take between one and six months' time to recover from floods and with recovery costs ranging between R1000 and R20 000. The accommodation flood recovery is important, since it gives an indication how long it takes the business to recover.

Table 4.6: The accommodation flood recovery process, including the recovery period and costs

Accommodation flood recovery process	**Flood recovery period (min and max)**	**Flood recovery cost ranges in ZAR (min and max)**
Hotel	Three days – two months	R 80 000 – R600 000
Lodge	Three months – one year	R 65 000 – R760 000
Guest House	Two weeks – three months	R 10 000 – R150 000
Bed & Breakfast	One week – three months	R 30 000 – R250 000
Self-catering accommodation	Two months – eight months	R 75 000 – R430 000
Other	One month – six months	R 1000 – R20 000
Total /Average	Two months – seven months	R261 000 – R2 210 000

(Source: Compiled by researcher's results, 2016).

The estimated flood recovery period takes between two months and a maximum of seven months, with recovery costs ranging between R261 000 and R2 210 000. The recovery expenses are high due the direct and indirect flooding impacts on the tourist accommodation. The research finding indicates that 72% of the tourist accommodation businesses do not have the finances or time to implement flood recovery processes. Tourist accommodation businesses do not appear to have insurance and or receive compensation for such risks and utilise profits and working capital to cater for the recovery process. Business risk insurance come at high prices, and it is not affordable for the small tourism business (Tsai and Chen, 2011; Cioccio and Michael, 2007; Klint *et al.,* 2012). Flood recovery funds for certain tourist accommodation businesses are easily accessible, but for others it remains a barrier, and may lead to a decline in business. A few direct quotes below provide evidence for this research finding.

> ***"We suffer the consequences of floods, tourists or guests cannot reach us and they are so much fear."*** **(Lodge, Respondent 28, Questionnaire).**

> ***"We had to stop people from coming to the establishment for a certain period. We had to do some security renovations."*** **(Self-catering accommodation, Respondent 30, Questionnaire).**

> ***"Due to the type of accommodation we are, we do not have the high safety measures like hotels or bed & breakfasts. Clients avoid our business, since we are not well equipped when hit by a flood."*** **(Other, Respondent 87, Questionnaire).**

***"To recover from floods takes longer than anticipated and so much time (6 months) is spent to recover, wasting an entire season."* (Guest House, Respondent 101, Questionnaire).**

Only about 27% of tourist accommodation continue with business after being affected by floods and through demarcating the flood-affected areas for tourist safety. Some depend heavily on the tourist bookings and numbers to keep the business running, but during and after floods the numbers drop. Many lower star graded tourist accommodation in the Mopani region have started a flood fund to save and donate funds for flood consequences (Klijn *et al.,* 2009; Bradford *et al.,* 2012; Fitchett *et al.,* 2016). Some of them still rely solely on the local government for compensation. The flood recovery process involves flood risk management plans and being provided and assisted with the right flood information in advance.

4.14. Increased flood forecasting and information through flood mapping

Presently, tourism demand models are developed for the global tourism industry based on changes in weather patterns (Hamilton *et al.,* 2005; Berrittella *et al.,* 2006; Goh, 2012; Jeuring and Becken, 2013b; Becken *et al.,* 2015). A number of climate change maps have been developed for the travel and tourism industry across many tourist destinations including Australia, India and other parts of Europe to plan for tourist flows (Berrittella *et al.,* 2006; Amelung *et al.,* 2007; Buzinde *et al.,* 2010; Filimonau *et al.,* 2011; Becken, 2013a; Becken *et al.,* 2015). Flood frequency is increasing in the research study regions, and it has led to an interest in flood warning, information, and forecasting in Limpopo Province. The research findings reveal that some accommodation managers do not know when and how floods occur in their operating regions. It appears that the daily *South African Weather Services (SAWS)* weather update and information, including rainfall chances and possibilities of flooding in the Province does not reach the tourist accommodation managers in time. The global tourism industry utilises weather and climate information to determine tourist demand and activity.

Flood information, forecasting and warning has begun to take shape in South Africa. Climate change maps are challenging to produce and predict on smaller spatial scales. Researchers, geographers and weather experts in the country have started to develop models that either project or predict future weather patterns (Poolman *et al.,* 2014; Bangira *et al.,* 2015; de Groen and Robinson, 2015). Precipitation and temperature averages in South Africa can provide

access to many anticipated climate change events (Maponya and Mpandeli, 2012; Sen Roy and Rouault, 2013; Malherbe *et al.,* 2014). There is currently insufficient Geographical Information Systems (GIS) and research done to assist in predicting possibilities of floods in South Africa. Figure 4.8 (below) presents a possible GIS flood map that can be used as a forecasting and information tool for the tourist accommodation in the three flood-prone regions. Local GIS flood mapping can be compiled using various available climatic data (Mondlane, 2010; Elkhrachy, 2015; Thiemig *et al.,* 2015; Musungu *et al.,* 2016)..

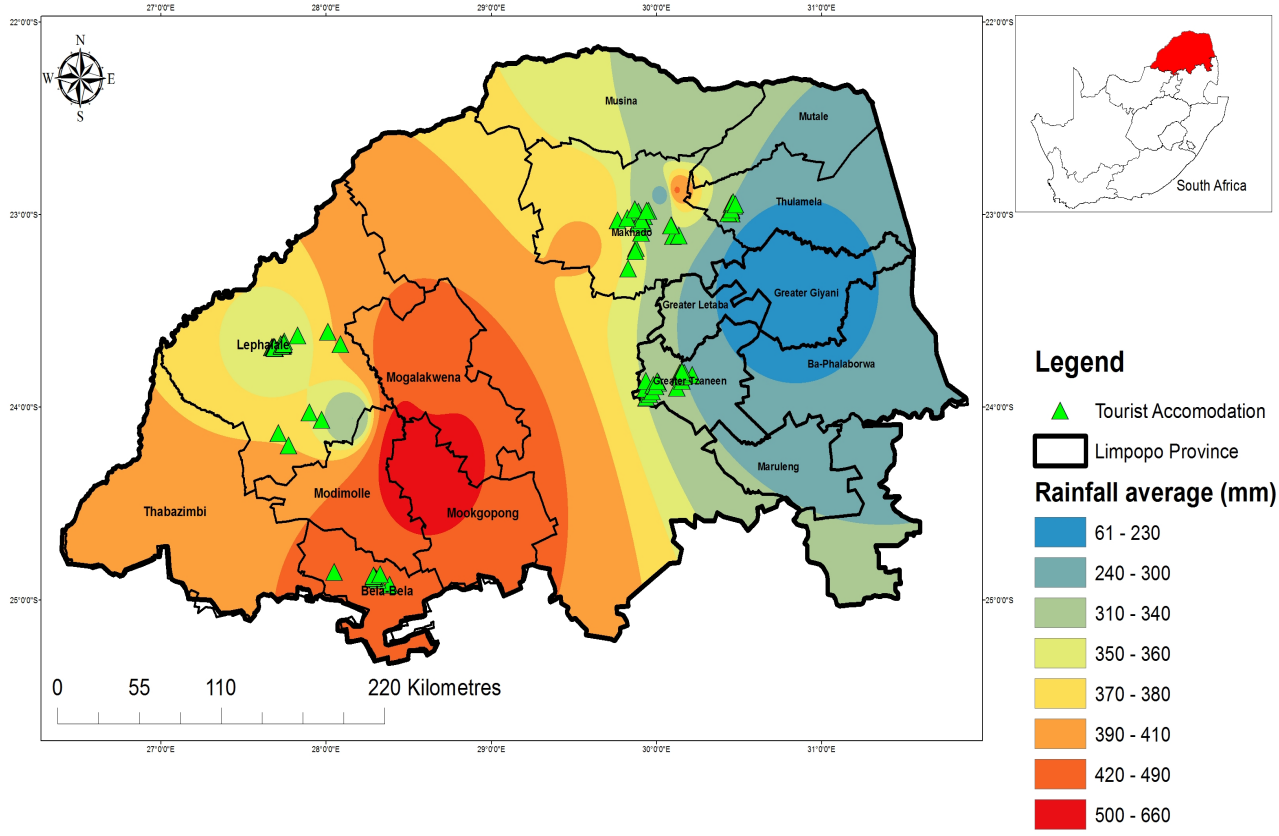

Figure 4.8: Precipitation averages from years 2000 to 2015 across the research study regions (Source: Compiled by researcher's results, 2016).

An attempt to create a GIS flood map with the study regions precipitation total averages for 15 years (2000-2015) has been included, since the interest in flood mapping is increasing. The 15-year precipitation figures from SAWS have been analysed for the GIS flood map. The GIS flood map provides an average rainfall over the past 15 years in areas where the tourist accommodation is located. The weather stations situated close to the flood prone research study sites and tourist accommodation were points to start the interpolation analysis of the total

precipitation averages. A GIS method of simple kriging stratified the interpolation. Simple kriging includes the average mean of stratified data used around a point to present a scale of averages across the given area (Elkhrachy, 2015; Thiemig *et al.,* 2015). The GIS flood map presents higher rainfall averages (mm) across the Waterberg region and lower rainfall averages (mm) across the Mopani region from the 15-year data. This might change in the future and increase across the Limpopo Province. Tourist accommodation managers can be provided with GIS flood maps to plan and prepare for future floods and changes in rainfall patterns.

4.15. The wider flooding impacts on the surrounding local communities

Floods have affected small businesses across the three study regions (Reason *et al.,* 2005; Khandlhela and May, 2006; Asante *et al.,* 2007; Mondlane, 2010). The research finding includes that the relationship between the accommodation, the environment, and the local community is important. Floods might have wider impacts on the environment and the local community. Tourist accommodation employs individuals from local communities. Tourism is seen as a tool for local economic development, employment and poverty alleviation (Bowd *et al.,* 2012; Day *et al.,* 2013; Rogerson, 2013b; Saarinen and Rogerson, 2013; Bernard and Cook, 2015). Tourist accommodation enhances local economic development through offering some form of employment, either full-time/permanent, part-time/temporary or contract/seasonal employment. These local individuals receive key roles, tasks, and responsibilities at the business. The accommodation types offer staff training, skills development, and various experiences for the community who may be employed. Small tourism businesses in tourist destinations have managed to create multiplier effects with the local communities, through the individuals they employ (Van Der Veen and Logtmeijer, 2005; Tao and Wall, 2009). The local community show appreciation and utilise the accommodation products and services regularly. Floods hinder their engagement with tourist accommodation businesses, and many are members of the community.

Floods have wider impacts on the environment through degrading the quality of ecosystems, soil, and agricultural activities. The environment forms part of the accommodation products and services (Awuor *et al.,* 2008). A few legal implications arise during floods and in cases of theft, legal policies, and claims are not taken seriously. A lack of service delivery and a lack of funds to recover from flooding may hinder new building plans and infrastructure.

Unfortunately, floods do not only affect tourist establishments, but also affect everyday life and operations in the surrounding environment.

4.16. Conclusion

This chapter has provided responses from accommodation managers as to what they perceive and experience during and after floods. Not all accommodation businesses are negatively affected by floods and manage to cope, but some are badly affected and experience recovery challenges. Accommodation bookings and reservations have become the central point of the research, since floods affected mainly tourist bookings and indirectly influenced all other tourist activities, facilities and activities at different accommodation types. The floods influenced tourist consumption and behavior, and directly motivated tourists to cancel, postpone, or shorten their trips. Severe floods have led both public and privately-owned establishments to close their doors, sell the property, and relocate. Floods have badly affected some parts of the research study sites where tourist accommodation could not recover. Some tourist accommodation owners and managers concluded that they have completely lost hope for the future, since they received no bookings after the floods. A few direct quotes below provide evidence for this research finding.

> ***"Guests become scared of floods in Bela Bela."*** **(Hotel, Respondent 46, Questionnaire).**

> ***"Everything goes down. Workers do not work, animals are scared, activities are put on hold and tourists do not come."*** **(Self-catering accommodation, Respondent 58, Questionnaire).**

> **"*Tourists did not stay and are still gone until today!"* (Guest House, Respondent 69, Questionnaire).**

> **"*The establishment had to close due to no bookings after the 2012 floods*." (Hotel, Respondent 67, Questionnaire).**

The recovery process was lengthy and costly for tourist accommodation. Flood-affected accommodation businesses matched the recovery costs with the recovery period, and with no expectations, eventually closed down. It has become evident through the data collection process that floods are devastating and tourist accommodation lacks in preparedness for floods.

In contrast, discovering that floods have a few opportunities and many risks for tourist accommodation has raised the idea of flood awareness and adaptation. Some accommodation businesses reap the benefits, whilst others suffer the flood aftermath. Interestingly, a few opportunities for the tourist accommodation included the curiosity of some tourists, who went back to establishments to see what has happened during the flood. These type of tourists make reservations and are known as last chance tourists, who want to see what happened before it is all over (Becken, 2013). The location, cheaper booking rates, and good tourist experiences provided the non-affected tourist accommodation with good business opportunities during floods. The inconsistency in bookings altered the accommodation tourist demand and booking patterns and created a highly competitive market for the hospitality environment across the three study regions.

A few accommodation managers concluded that the flood laws, policies, and plans should be incorporated into the Environmental Act, with special reference to businesses being affected by natural disasters. The planning and mitigating against floods are challenging managerial tasks, since some plans require funds, training, time, and changes to management. There are no clear and definite flood forecasting and information systems to provide warning on a large scale. Early flood warning should assist tourist accommodation businesses who are at risk to prepare and prevent for any possible impacts and losses from floods. To conclude, the tourist accommodation managers experienced floods differently, but they all perceive floods as a hazard, since it causes damage and fatalities. The accommodation managers calculated and measured how hazardous floods are, only after seeing what flooding has done to their properties, the environment, and the local communities. After realising the consequences of floods, the managers have perceived floods to be problematic for tourist accommodation businesses and have realised that swift solutions are required.

5. CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

"Oh! I hear the saddened cry for help.
The wail of sore distress;
Oh! Hear the awful cry of woe,
that comes from out the west". ~ George C. Rhoderick, Jr.

5.1. Introduction: Towards flood risk management planning for the tourism accommodation sector

The study created an opportunity to advance the understanding of flooding and tourism research in flood-prone tourist destinations. Research into floods and tourism has recently begun to include the impacts of floods on tourism businesses (Mbaiwa and Mmopelwa, 2007; Tempelhoff *et al.,* 2009a; Zahed *et al.,* 2014; Bernard and Cook, 2015; Ghaderi *et al.,* 2015). The consequences of floods for tourism businesses have become important factors for the tourist demand and tourist destination development. However, research has shown that tourism businesses lack response, resilience and recovery measures to combat the flood challenges (Ritchie, 2008; Klint *et al.,* 2012; Espiner and Becken, 2014). Debates continue about the best strategies for the management of floods for tourism businesses. This study presents the key issues regarding flooding impacts on tourist accommodation. The majority of current flooding and tourism research focuses on coastal flooding (Smith *et al.,* 2015; Fang *et al.,* 2016; Wolff *et al.,* 2016). The focus of the study is on *in-land* flooding affecting tourist accommodation in three summer rainfall and flood prone regions (Waterberg, Vhembe, and Mopani) of the Limpopo Province in South Africa. This study shows the tourism accommodation sector's weak adaptive ability to cope with the challenges of flooding impacts compared with other tourism business types.

The study offers insight into various accommodation management approaches to flood adaptation. Recent studies investigated the economic costs after floods in the Limpopo Province through the tourism accommodation sector, and affirmed that tourism rests on the development, growth, and contribution of tourist accommodation (Fitchett *et al.,* 2016; Hoogendoorn and Fitchett, 2016). Moreover, the economic evaluation of flooding impacts are easier for tourist accommodation to understand the context they operate in and the purpose of why/how they operate. This study indicates that tourist accommodation types across the study

regions experience a wide range of flooding impacts and the flooding impacts expose them to weather related natural disasters. Tourist bookings and reservations are central to the subject of floods and tourism. Floods directly and indirectly impact the booking and demand patterns that further affect the business operations during floods. The study explores the changes in tourist booking numbers and costs during and after floods, and determines the length of tourist stay. The flooding impacts result in opportunities and risks for tourist accommodation in a highly competitive tourism environment. The study concludes with the urgent need for flood risk management plans for the survival of tourism in the study regions.

5.2. The theoretical contribution to flooding and tourism research

One major theoretical issue that has dominated the field recently concerns flood vulnerability, adaptation, and management practices. This study has incorporated theory into the exploration of flooding impacts on tourist accommodation, to develop a theoretical framework for the successful identification and management of floods in a business context. Flooding impacts should be contextualised within the tourist setting they occur, to understand the relationship between tourism and the environment. Tourist accommodation businesses contribute to the local economy of many tourist destinations, since the sector includes value contributing factors. Tourists visit different destinations based on the variety of accommodation services, located in the appropriate setting for tourist activities and expenditure. Tourists make use of accommodation services that increase their length of stay in the interested destination. Floods create implications for tourist visitation and may lead to a decline in domestic travel and tourism in the study regions.

This study aims to add new perspectives on the relationship between flood risks and tourism. Flooding is currently affecting the growth of the tourism industry, and flooding impacts on tourist accommodation may adversely affect socio-economic development in some areas. Flood awareness is needed to reduce the direct impacts of flooding. The exposure and vulnerability of tourist accommodation to floods are not entirely known, due to the different types of accommodation, operations, and services. This research has provided insights into the lack of flood research and awareness for the tourism accommodation sector. Flood research and awareness is required, since the tourism accommodation sector is currently not provided with flood warnings and information, very few flood risk management plans are in place, and

little responsibility appears to be taken. This study aims to create suitable and critical themes for flooding and tourism research to enable the further development of research into the relationship between tourism and flooding.

5.3. Key research findings and arguments

The findings contribute to the field of tourism and flooding, the geography of tourism and tourism development, to unlock new insights regarding the impact of flooding on tourism across different locations. To consolidate the key research findings, the research objectives of this study are:

- To explore the tourist accommodation managers' perception of changes in tourist reservations in an event of a flood.

All tourist accommodation managers indicate that floods do affect their tourist reservations and tourist numbers. Less tourists book during and after flooding events. The accommodation flood exposure and changes in accommodation bookings and rates were predominantly though media, tourist word of mouth, and local messages regarding the flood risk. The sharp decline and increase in bookings have altered the seasonal demand patterns of the tourist interest. The peak seasons are high in tourist demand and bookings, but for the Limpopo Province, the higher seasonal temperatures lead to intense and prolonged rainfall causing floods affecting tourist bookings.

- To determine if the tourists' length of stay is affected during flooding episodes.

Floods influence tourist bookings and the tourist length of stay. In the event of floods, tourists are not able to stay and engage in activities, and revenue is lost. The local economic contribution of tourism in such areas decreases, thus indirectly affecting related tourist activities. However, progressive tourism accommodation businesses not exposed to floods provide access for a large number of tourists and economic opportunities. Floods influence the tourists' consumption and behaviour and encourage tourists to cancel, postpone or shorten their trips and even depart. It is evident that floods influence the tourist length of stay at

accommodation, and the reasons originate from a variety of psychological, behavioural, socio-cultural, and socio-economic factors.

- To critically evaluate whether there are adaptation plans for tourist accommodation vulnerable to floods

The importance of identifying floods as a hazard rested on the responses from accommodation managers to understand their perceptions of flooding experiences and impacts. There is a relationship between the flood frequency scale and the total number of accommodation businesses across the study regions. There are similarities between the listed direct flooding impacts of different types of accommodation but the differentiating factor focuses on the extent of the direct impact, the star grading, and the geographical setting. The direct flooding impacts include the physical impacts on the buildings, environmental setting and the infrastructure. There is uncertainty between the direct flooding impacts and indirect flooding impacts. Managers are unable to identify the different flooding impacts. The indirect flooding impacts clarify the uncertainty of the flood impact assessment elements. The indirect flooding impacts create implications for repeat tourist visitation to the region or town. Further implications include problematic areas of service delivery, local government supply and support, employment, wages and profits, injuries and safety, and evacuation procedures.

Floods affect the tourist activities, facilities, and services that might increase the flood vulnerability of the tourist accommodation business. The tourist accommodation across the three regions determined their flood vulnerability through the location and geographic setting, the local economic contribution and linkages with the surrounding local communities. Tourist accommodation vulnerable to floods do not have the ability to cope with the consequences of floods. Flood risk management plans are challenging. Time and costs are also an issue. The accommodation either do not have the finances or the time to implement flood recovery. The responsibility to plan and implement flood risk management plans by accommodation managers is currently not a priority. A strong emphasis should be placed on tourist accommodation owners, stakeholders and investors to assist in taking the responsibility to ensure that they have a flood risk management plan. Tourist accommodation may have no insurance or compensation for flood risks and managed to utilise profits and working capital to recover. The relationship between the accommodation, the environment, and the local

community is important. Floods are likely to have wider impacts in the future mainly on the environment and the local community.

5.4. Critical reflections on the research process

The study explored the perceived flooding impacts on tourist accommodation in the Limpopo Province, South Africa. A total of 119 tourist accommodation participated in the study, across the three study regions Waterberg, Vhembe, and Mopani. Various types of accommodation services were included namely: hotels, bed & breakfasts, lodges, guest houses, self-catering and other types of accommodation services. The study focussed on exploring the perceived flooding impacts from a tourist accommodation managements' perspective. Therefore, the purposeful sample size included only accommodation managers, owners and management staff. Despite the success of the above-mentioned research process a limitation with regard to the online semi-structured questionnaire was experienced. The data collection process using the online semi-structured questionnaire was challenging. The data collection was extended to the summer season of the Province and lasted three months to provide tourist accommodation managers with adequate time to gather data and understand flooding events.

5.5. Recommendations for practical applications of the key research findings

Due to practical constraints, this study does not intend to provide a comprehensive review of the flood quantification, hydrology, and climatology of the flooding impacts on tourist accommodation. It is beyond the aim of the study to examine hydrological and climatic issues regarding flooding impacts. The study is based on the perceived flooding impacts on tourist accommodation. However, a few practical recommendations are made to assist accommodation owners and managers. The use of the theoretical framework as a managerial tool during and after floods can assist tourist accommodation managers in reducing flooding impacts and recovery processes. The theoretical framework first identifies if the flood is a hazard or not, second it explores what exposes the business to floods, third it assesses the vulnerability to floods and lastly, it searches and implement adequate adaptation measures and capabilities. The framework can be used as a guideline to manage and adapt to floods. Figure 5.1 (below) presents a possible flood risk management model that accommodation managers can use as a framework as a guideline during floods.

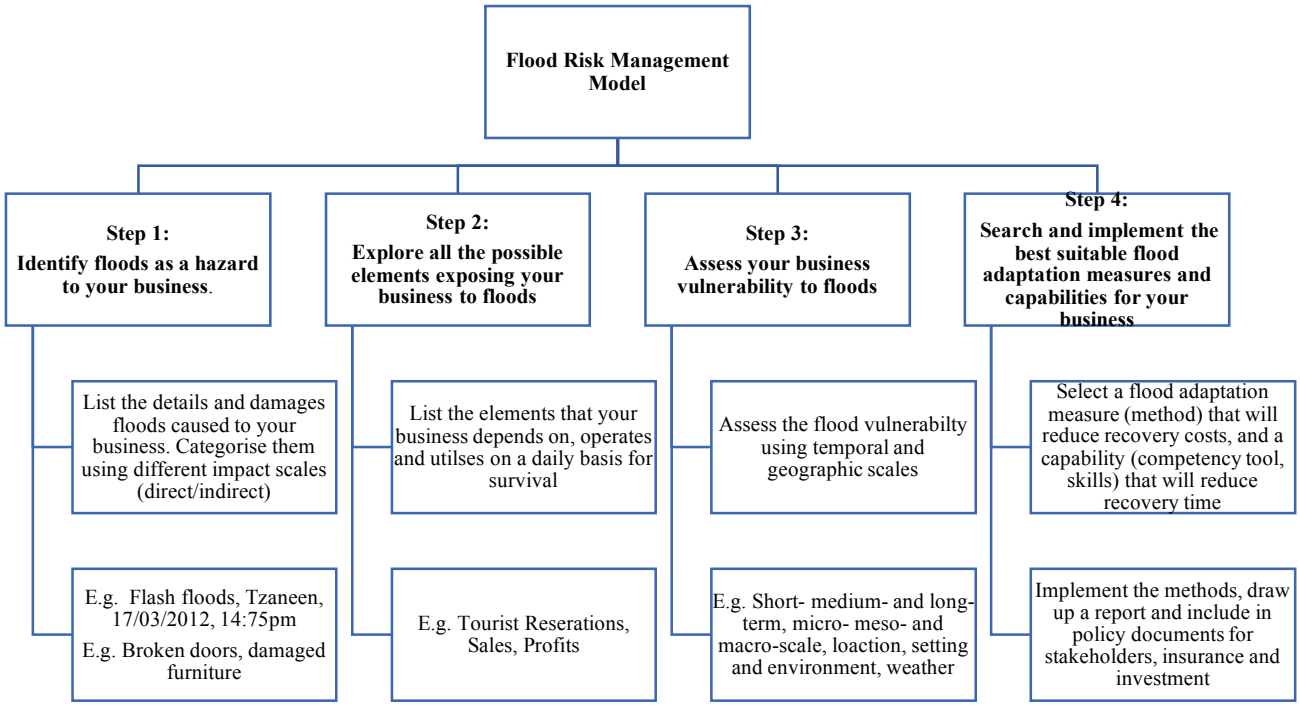

Figure 5.1: Using the study theoretical framework as a flood risk management model (Source: Compiled from: Researcher's model from research content, 2017).

The issue of flooding and tourism demand has received considerable critical attention however tourism demand models are not applicable for flood forecasting and planning for tourist accommodation. Many flood forecasting and information requests for flood mapping lead to the developing of flood index maps for tourist accommodation, similar to tourism climate index maps. Flood mapping can provide useful information for the establishments to plan accordingly and consider possible future flood events. Flood mapping can further assist in planning the desired tourist product and services (Amelung *et al.,* 2007; Moore, 2010; Rossell-Nadal, 2014). Tourist demand and flows that are controlled through flood mapping and information can be easily distributed and understood amongst the local community. Flood mapping can lastly educate, prepare and reduce the wider far-fetched flooding impacts on the local community based in the research study sites. The flood mapping can be done through GIS and remote sensing. Recent developments in the field of GIS have led to a renewed interest in flood GIS and remote sensing for the tourism and hospitality sector. Lastly, a practical suggestion is to

implement a flood compensation fund or insurance, affordable and accessible for all accommodation types affected by floods. The local government and municipality could play a supportive role in assisting flood affected accommodation to recover, especially with basic service delivery, damaged infrastructure, and shelter for displaced locals. Accommodation managers in the flood-prone study regions could form a collective, commonly agree on the shared flood consequences and present their difficulties during floods as one voice, for the survival of their contributing businesses.

5.6. Suggestions for further research

Researchers have not investigated flooding impacts on tourism in much detail, therefore temporal capabilities during floods across different locations have not been researched. This study can lead to further research regarding the increase in the development of new establishments in flood-prone regions and how they can become more resilient to floods based on the environments they operate in. More studies are required, especially towards hospitality research taking the environment into consideration. Climate change variabilities such as drought, can affect the business operation due to water restrictions in some parts of the Provinces, and their loss in business due to severe drought can be correspondingly explored. A further suggestion includes research on future or past flood water levels to assess the amount of flood damages and how floods damage accommodation property, facilities, and infrastructure. The flood water levels can be compared with records from previous floods to predict the increase or decrease of flooding impacts, flood water levels and floods in the region. Lastly, more accurate and simplified tourist demand models to measure tourist demand and supply during peak and off-peak seasons are needed, especially for profitable accommodation operating in highly competitive flood-prone regions.

5.7. Final key statements

Finally, in conclusion, for those managers of tourist accommodation establishments, it is hoped that this study makes a contribution in advancing our knowledge of the impact flooding has on the local tourism sector. Furthermore, the tourist accommodation managers' perceptions of flooding impacts, speak to the grim reality they often face.

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Appendix A: Ethics Clearance Certificate

Research Office

HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)
R14/49 Southon

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER: H15/09/36**
PROJECT TITLE	Exploring the perceived impact of flooding on tourist accomodation establishments in the Limpopo Province, South Africa
INVESTIGATOR(S)	Ms M Southon
SCHOOL/DEPARTMENT	GAES/
DATE CONSIDERED	18 September 2015
DECISION OF THE COMMITTEE	Approved unconditionally
EXPIRY DATE	01 November 2018

DATE 02 November 2015 **CHAIRPERSON** _____
(Professor J Knight)

cc: Supervisor : Ms C Chamberlain

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10005, 10th Floor, Senate House, University.

I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to completion of a yearly progress report.**

_____ _____/_____/_____
Signature **Date**

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES

Appendix B: Respondent Participation Information Sheet

School of Geography, Archaeology and Environmental Studies
Private Bag 3, Wits 2050, South Africa Enquiries: **GEOGRAPHY:** TEL: +27 11 717-6503 •
ARCHAEOLOGY: TEL: +27 11 717-6045 •
http://www.wits.ac.za/geography/

Participant Information Sheet

Study title:	*Exploring the perceived impact of flooding on tourism accommodation establishments in the Limpopo Province, South Africa*		
Areas:	Waterberg, Vhembe & Mopani regions of the Limpopo Province	**Supervisors:** Dr Cheryl Chamberlain and Dr Clinton van der Merwe	
Researcher:	Mercia Southon 533060	**Contact phone number:**	+27 78 933 9158

Dear Sir/Madam

I am Miss Mercia Southon enrolled at the University of the Witwatersrand doing a Masters in Science for the Department of Geography, Archaeology, and Environmental Studies under the Faculty of Science.

I invite you to take part in this study to explore the perceived impact of flooding tourist accommodation establishments in the Limpopo Province, South Africa. The focus is mainly on the managers' perceptions on possible changes in tourist demand, management, and adaptation after flooding events. The study objectives are to firstly explore the tourist accommodation establishment's managers' perception of changes in tourist reservations during and directly a month after flooding episodes. Secondly, to determine whether floods affect tourist's length of stay. Lastly, to identify and explain adequate adaptation plans to prevent future flooding losses observed from the establishment's vulnerability.

I would like the participant to answer a semi-structured, open-ended and paper-based questionnaire. It will take approximately 20 minutes. This Participant Information Sheet will assist you in deciding if you would like to participate or not and no reasons are required for withdrawing. It also sets out why I am doing the study and what your participation would involve. However, there are no benefits for participation.

If you agree to be a participant of this study, you will be asked to sign the Consent Form. Your participation will remain anonymous and confidential throughout the study and all your responses will be used for research purposes only. You will be at no risk and if you require any information regarding this study please enquire.

Thank you.

Mercia Southon	*Dr Cheryl Chamberlain*	*Dr Clinton van der Merwe*
533060@students.wits.ac.za	cheryl.chamberlain@wits.ac.za	clinton.vandermerwe@wits.ac.za
+27 78 933 9158	+27 11 717 6514	+27 11 717 3173

Appendix C: Respondent Consent Form

School of Geography, Archaeology and Environmental Studies
Private Bag 3, Wits 2050, South Africa Enquiries: GEOGRAPHY: TEL: +27 11 717-6503 •
ARCHAEOLOGY: TEL: +27 11 717-6045 •
http://www.wits.ac.za/geography/

Consent Form: Research Participation

Study title:	*Exploring the perceived impact of flooding on tourism accommodation establishments in the Limpopo Province, South Africa*		
Areas:	Waterberg, Vhembe & Mopani regions of the Limpopo Province	**Supervisors:** Dr Cheryl Chamberlain and Dr Clinton van der Merwe	
Researcher:	Mercia Southon 533060	**Contact phone number:**	0789339158

I have read and understood the information about the product as provided in the information form and confirm that Mercia Southon is rightfully allowed to anonymously use my contribution towards her studies.

I, the undersigned, confirm that I voluntarily agree to participate in the project. The procedures regarding confidentiality have been clearly explained to me and my answers will remain anonymous protecting my identity. There are no benefits for participating. I also understand that I can withdraw at any time without giving reasons and that I will not be penalised for withdrawing nor will I be questioned on why I have withdrawn.

Lastly, I understand and agree along with the Researcher on the terms and conditions of the study to adhere to them; sign and date this informed consent form.

Participant:

_____	_____	_____
Name of Participant	Signature	Date

Researcher:

_____	_____	_____
Name of Researcher	Signature	Date

Appendix D: Respondent Questionnaire

School of Geography, Archaeology and Environmental Studies
Private Bag 3, Wits 2050, South Africa Enquiries: GEOGRAPHY: TEL: +27 11 717-6503 •
ARCHAEOLOGY: TEL: +27 11 717-6045 •
http://www.wits.ac.za/geography/

Questionnaire : Accommodation Managers Only

Study title:	*Exploring the perceived impact of flooding on tourism accommodation establishments in the Limpopo Province, South Africa*		
Areas:	Waterberg, Vhembe & Mopani regions of the Limpopo Province	**Supervisors:** Dr Cheryl Chamberlain and Dr Clinton van der Merwe	
Researcher:	Mercia Southon 533060	**Contact phone number:**	0789339158

Please note: All the questions are based on the perceived flooding impacts the establishment might face due to area vulnerability.

Section One: A change in management perspective in an event of a flood.

1.1. What type of tourist accommodation service do you offer? *Select your answer.*

Hotel ☐ *Lodge* ☐ *Guest House* ☐ *Bed & Breakfast* ☐ *Self-catering* ☐

Other _____

1.2. How many guests can your establishment accommodate? *Provide number of guests.*

Number of guests _____

1.3. How many rooms do you have in your establishment? *Provide number of rooms.*

Number of rooms _____

1.4. From a scale of one (1) to five (5) how do floods affect your bookings? *Select a scale option.*

No affect	*Minor affect*	*Neutral*	*Moderate affect*	*Major affect*
1	*2*	*3*	*4*	*5*

1.5. Describe the effect the floods have on your bookings.

_____
_____
_____

1.6. What are your accommodation rates? *Provide rates for both single and sharing during peak and off-peak season *Preferably in South African Rand (ZAR).*

Peak season		***Off-Peak season***	
Per night: Per Person	*Per night: Per Person Sharing*	*Per night: Per Person*	*Per night: Per Person Sharing*

1.7. From a scale of one (1) to five (5) how do floods affect your accommodation rates? *Select a scale option.*

No affect	*Minor affect*	*Neutral*	*Moderate affect*	*Major affect*
1	*2*	*3*	*4*	*5*

1.8. What type of tourist market do you target? Explain why.

_____
_____
_____

1.9. List the tourist activities, facilities, and services that your establishment offers.

Tourist activities	***Tourist facilities***	***Tourist services***

Section Two: Determining the length of stay caused by floods.

2.1. From a scale of one (1) to five (5) what is the frequency of floods in your region? *Select a scale option.*

Never	*Rarely*	*Sometimes*	*Often*	*Always*
1	*2*	*3*	*4*	*5*

2.2. List the impacts your establishment experienced in an event of a flood.

_____
_____
_____

2.3. How did the above-mentioned impacts have an influence on the tourist/guest length of stay? *Tourist/guest length of stay at your establishment.*

_____
_____
_____

Section Three: Adequate adaptation plans to prevent future flooding losses.

3.1. What is the absolute location of your establishment? Provide GPS coordinates.

_____

3.2. How vulnerable is your establishment to floods? *Select a scale option.*

Not vulnerable	*Slightly*	*Somewhat*	*Very*	*Extremely vulnerable*
1	*2*	*3*	*4*	*5*

3.3. Explain your above-mentioned vulnerability scale.

_____
_____
_____

3.4. Does your establishment have a flood risk management plan?

Yes ☐ No ☐

3.5. Who's responsibility is it to provide your establishment with a flood risk management plan?

_____

3.6. What is your recovery period after a flood has occurred? *The duration it takes for your establishment/business to recover.*

_____
_____
_____

3.7. How much does it cost you to recover from any flood impact? *Preferably in South African Rand (ZAR).*

_____

3.8. List the wider flooding impacts that affect your establishment (consider environmental, socio-cultural, economic, technological, political and legal factors).

_____
_____
_____

3.9. Do you wish to be contacted via telephone for more information?

Yes ☐ No ☐

Thank you for your participation.

Appendix E: Telephone interview responses

FLOODING IMPACTS ON TOURISM - TELEPHONE INTERVIEW*

Inbox x

Questionnaire Responses x

Mercia Southon <southonmercia@gmail.com> 2 May 2016

to bcc: Safari, bcc: safari, bcc: safarilodges, bcc: Michele, bcc: smithres, bcc: Gill, bcc: Jan, bcc: in

Good day Mr/Ms,

I write this email to remind you about our agreed telephone interview to gain more insight on your perception of flooding impacts on tourism in your area.

I formally asked you via our email conversation about a two weeks ago to give you a quick call. Are you still willing?

If yes, the call will not be longer than three (3) minutes and the following questions will be asked:

1. What is your take on tourism in your area*? (i.e., this may be the surrounding environment of your establishment, the entire region/district or just specific parts if you wish to give reference to them).

2. What is the weather like during the summer months in that area*?

3. Have you experienced a flood (i.e., personal, your establishment or whilst being in the area*) **and if yes, provide an explanation of your experience.**

4. What is your understanding of the following: flood vulnerability and flood adaptation?

Area(s) are the research study regions/districts (Waterberg, Vhembe and Mopani) of the Limpopo Province.

All questions are processed to be brief and can all still be answered even if you are no longer a resident of that area, relocated or if your are a tourist intermediate. Also, I am interested in your experience whilst you were situated in that area.

I humbly ask to **gain your consent to participate and to assure you that:**

- Your identity will not be revealed (i.e., the call will remain anonymous).
- The telephone call, interview questions and answers will be for research purposes only.
- Interest only lies in different viewpoints, flooding experience, tourism importance and the involved areas*.
- I, Mercia Patricia Southon will call you directly from my personal telephone that is not linked to any unprotected lines and conduct the interview with you.
- The call will not be longer than three (3) minutes.
- The call might be recorded for my personal research quality and control purposes (to be destroyed five (5) years after the research is completed). PS no reference will be made to you.

By agreeing to continue with the telephone interview, I would like you to confirm the date and time of the interview.

Date: 12 May 2016 (next week)
Day: Thursday
Time: Morning, between 09:00am and 12:00pm
Please reply via email with a yes or no.

Please find attached research protocol, participant information and consent form.

Your time and additional assistance is appreciated.

10 interviews
Safari Destinations <bookings@safaridestinations.co.za>,
safari@telkomsa.net,
safarilodges@worlddonline.co.za,
Michele Smith <michele@thornwoodlodge.co.za>,
smithres@icon.co.za,
Gill Smithies <moramist@vodamail.co.za>,
Jan Joubert <plaasgst@telkomsa.net>,
info@mabole.com
Musina Hotel gm@musinahotel.co.za Cynthia Snyders

Waterberg:

Bela Bela x1 lodge and x1 guest house and x1 B&B (Peet)
Lephalale x1 lodge and x1 guest house

Vhembe:

Musina x1 Hotel (Cynthia)

Mopani:

Phalaborwa x1 lodge
Hoedspruit x1 lodge and x1 B&B
Haenertsburg x1 Guest House

Quotes Key things
+ category / theme

09:30
min
@ 4 10sec
Vhembe Hotel
(Cynthia)

Interview 1:

1. **What is your take on tourism in your area*?** (i.e., this may be the surrounding environment of your establishment, the entire region/district or just specific parts if you wish to give reference to them).
Tourism is growing in the Vhembe region. Everyday we see more and more tourist attractions and accommodations being established. Many people lack understanding about tourism and its benefits. Some still do not get it that tourist accommodation/hotels/the hospitality industry falls under tourism. Parts in the region growing rapidly: Musina, Thohoyandou, Louis Trichardt.
2. **What is the weather like during the summer months in that area*?**
During summer it gets very hot. Highest daily temperature up to 45°C. It tends to get uncomfortable, but some tourists love it. Some international tourists never experienced such heat and stay and sit in our swimming pools, streams and gardens. Sometimes we receive rain and sometimes not, but most of the time days are hot.
3. **Have you experienced a flood** (i.e., personal, your establishment or whilst being in the area*) **and if yes, provide an explanation of your experience.**
No floods experienced, but we are aware of the increase in flood numbers in the region and province.
4. **What is your understanding of the following: flood vulnerability and flood adaptation?**
Flood vulnerability - I would say how vulnerable something/someone is to a flood.
If the chances are great that you/something can be attacked by floods when it occurs.
Also, I think if you are situated or close by to areas more floods occur.
Flood adaptation - How you/something adapts after floods.
What do you do to recover; what are your plans
How do you deal with the costs, lost, and damages.

10:10
5:00
Bela Bela Lodge
Waterberg
(Peet)

Interview 2:

1. **What is your take on tourism in your area*?** (i.e., this may be the surrounding environment of your establishment, the entire region/district or just specific parts if you wish to give reference to them).
For those who understand tourism, are familiar with what it entails, tourism was viewed as all areas Bela Bela town and surrounds of the waterberg region has for years been about tourism. Attraction to green, eco-friendly, relaxing tourism. Tourism is the reason for the town and the people's income, development. The tourism and jobs created.
2. **What is the weather like during the summer months in that area*?**
Bela Bela is relatively warm with sunny days throughout summer and spring. It can get really hot during summer - the town dries out, more dusty with reduced vegetation. Businesses do well. Tourists enjoy the warm weather (entrepreneurs tourist experience, since it is tourist town). The town is small, but during summer crowded + busy, many holiday makers.
3. **Have you experienced a flood** (i.e., personal, your establishment or whilst being in the area*) **and if yes, provide an explanation of your experience.**
Yes. It was the worst thing that could have happened to the town and many industries, property and surrounding communities. The floods swept everything away, 80% of town was in town (crops affected) need to replant again. The lodge (tourist accommodation establishment) experienced road collapses after the floods. Everything was destroyed, roads, bridges, power cables could not work. The lodge was cut off from the town, 4 people were trapped in valley on island. Some were injured, 1 person died in valley on island.
4. **What is your understanding of the following: flood vulnerability and flood adaptation?**
Both concepts have to do with flooding impacts, ie the flood effects (after a flood has occurred).
Flood vulnerability - how prone to floods your establishment is. Things (factors such as distance, weather, elevation and setting makes an establishment vulnerable to floods. Vulnerability is also measured by the amount/scale of impacts or level of damage / effect. Eg it is high it may be vulnerable, if it is low not so vulnerable.
Flood adaptation - This goes hand in hand with flood mitigation, flood preparedness, flood resilience, flood planning.
It is a terminology or categories like disasters, floods, cyclones, it involves recovery and management after floods.

@ 4 mins 29 sec 10:45

Interview 3:

1. **What is your take on tourism in your area*?** (i.e., this may be the surrounding environment of your establishment, the entire region/district or just specific parts if you wish to give reference to them).

Tourism still has (more) he potential to grow in my area (region) our tropical fields, weather and beautiful landscapes are (good) factors for tourism development. However, currently lacks effective + efficient tourism promotion. There are many tourist accommodation establishments, especially B&B's, Guesthouses, Backpacker accommodation and self-catering units. Some locals have not yet (or don't at all) fully understand the significance of tourism.

2. **What is the weather like during the summer months in that area*?**

We receive a lot of rain during our summer months, this is due to us being situated in a summer rainfall region and the tropical nature of our area. Our climate (and) is more moist. We reach high temperatures with good sunny days, but with the months of summer we receive rain.

3. **Have you experienced a flood** (i.e., personal, your establishment or whilst being in the area*) **and if yes, provide an explanation of your experience.**

Yes, we (our guest house) has been affected by floods and our experience during and after the floods were not very pleasant. We are situated in a mountainous range (steeped downwards area) and during heavy rainy water travels down from mountain peaks, accumulating (in) normal river environment. This has damaged 65% of our property and cost us time and a serious amount of money to fix. We were out of business for 6 months. We (still) are advertising on booking.com

4. **What is your understanding of the following: flood vulnerability and flood adaptation?**

In some (not) there are more scientific explanations, definitions and understanding to these terms. But my personal understanding on flood vulnerability and flood adaptation is the following:

Flood Vulnerability: the risks and possibilities flood poses to your area's or of floods happening. Vulnerability includes any flood risks and possibilities happening (to flood)

Flood adaptation: what the process is after floods, how the area (establishment) recovers.

Page | 5

11:35 @ 03 mins : 15 sec

Interview 5:

1. **What is your take on tourism in your area*?** (i.e., this may be the surrounding environment of your establishment, the entire region/district or just specific parts if you wish to give reference to them).

Tourism is of great economic development and growth booster.

- Tourism is growing in the country and in our province
- Tourism creates (new) small businesses
- Tourism has also created competition among it other businesses and industries

2. **What is the weather like during the summer months in that area*?**

Hot sunny days

Rain

3. **Have you experienced a flood** (i.e., personal, your establishment or whilst being in the area*) **and if yes, provide an explanation of your experience.**

No floods experienced (our establishment). Flood occurred two years ago 2018 in the area and washed a (bridge) tourism structures and other businesses.

The entire township area was in ruins, everything was destroyed

4. **What is your understanding of the following: flood vulnerability and flood adaptation?**

I have no clear understanding with it.

Flood vulnerability is the chances one can be affected by floods, like how close or how high the chances are.

Flood adaptation is the measures taken after a flood

Example: how the municipality (government helps to fix things, floods, recover.

Page | 7

11:20 @ 3:09

Interview 4:

1. **What is your take on tourism in your area*?** (i.e., this may be the surrounding environment of your establishment, the entire region/district or just specific parts if you wish to give reference to them).

Tourism is important for the economy, especially in our region. Tourism generates income, creates employment, creates linkages with the local community (benefits) and it boosts the regions economy, (well) wherever (a) tourism possibilities. Tourism, especially in terms of scenic, game, section of wildlife tourism (is) how (incorporated) much in the area - (they) this calls for more (tourists) to preserve and (preserve our) nature and wildlife.

2. **What is the weather like during the summer months in that area*?**

Extremely hot with maximum temperatures of 40°C. We also receive summer rain. This year it was delayed due to the El Niño weather and (some areas) experienced drought.

3. **Have you experienced a flood** (i.e., personal, your establishment or whilst being in the area*) **and if yes, provide an explanation of your experience.**

Personally yes (there where) floods close by (a good 2 km away) and it affected our business. Roads were destroyed and (made it inaccessible / inaccessible to) (not) travel to our lodge. We lost a lot of bookings

4. **What is your understanding of the following: flood vulnerability and flood adaptation?**

Flood Vulnerability: how close the risk of flooding is to you.

Flood adaptation: how you (would) anything (to) (improve) after floods occurred.

Page | 6

11:50 @ 04:20

Interview 6:

1. **What is your take on tourism in your area*?** (i.e., this may be the surrounding environment of your establishment, the entire region/district or just specific parts if you wish to give reference to them).

Tourism is a good source of income. Although some people do not fully understand it / are fully aware of it, it (remains) is the (dark). Tourism is growing in the [redacted] region. Every week you (see) are (about) new tourism (products) + offerings new lodges, new (game / safari) (tours) and (drives), (tourist) attractions and (many) more.

2. **What is the weather like during the summer months in that area*?**

Bela Bela gets very warm (sunny) in summer months. A lot of outdoor activities take place.

3. **Have you experienced a flood** (i.e., personal, your establishment or whilst being in the area*) **and if yes, provide an explanation of your experience.**

No. We have not experienced a flood.

* Bela Bela local municipality (was) a lot of interventions (floods) in the area.

- It (has) affected tourism (mostly, especially) for the private owners.

4. **What is your understanding of the following: flood vulnerability and flood adaptation?**

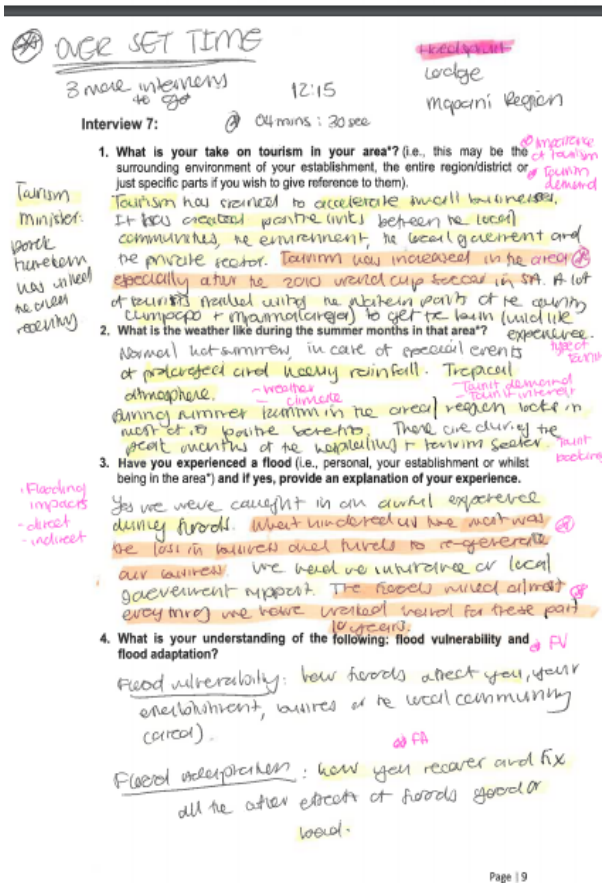
To be (aware) of floods a lot of (management, procedures / and) (@ FV @ FA) (over) all (ones) need to be taken into consideration.

Flood (damages) are (bad).

Flood vulnerability: risk to floods

Flood adaptation: (management) (advantages).

Page | 8



OVER SET TIME

3 more interviews to go

12:15

Lodge

Mopani Region

Interview 7: 04 mins : 30 sec

1. **What is your take on tourism in your area*?** (i.e., this may be the surrounding environment of your establishment, the entire region/district or just specific parts if you wish to give reference to them).

Tourism has seemed to accelerate small businesses. It has created positive links between the local communities, the environment, the local government and the private sector. Tourism was increased in the area especially after the 2010 world cup soccer in SA. A lot of tourists passed using the eastern parts of the country (Limpopo + Mpumalanga) to get the town (wild life

2. **What is the weather like during the summer months in that area*?**

Normal hot summers, in case of special events of prolonged and heavy rainfall. Tropical atmosphere.

During summer tourism in the area/ region looks in most of its positive scenario. There are during the peak months of the hospitality + tourism sector.

3. **Have you experienced a flood** (i.e., personal, your establishment or whilst being in the area*) **and if yes, provide an explanation of your experience.**

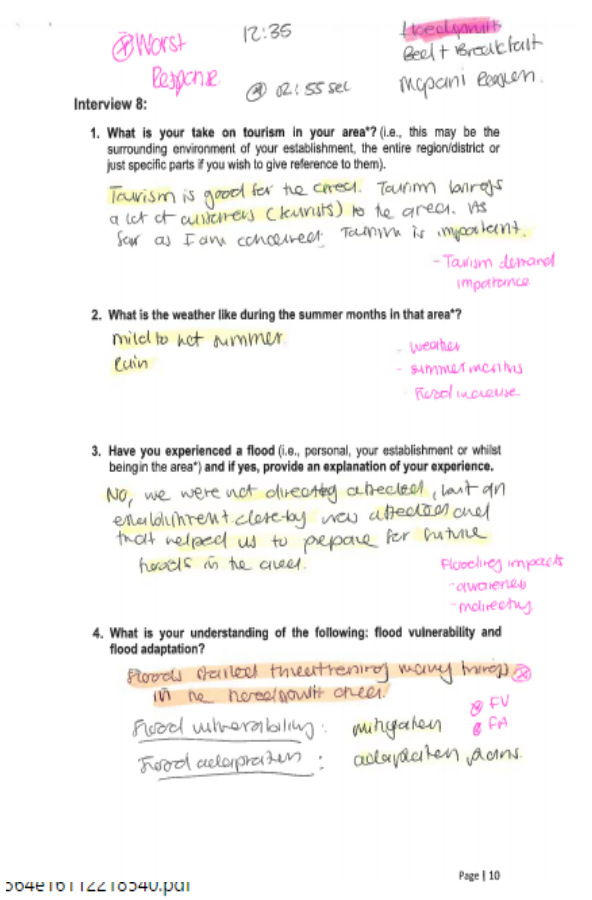
Yes we were caught in an awful experience during floods. What hindered us the most was the lost in business and funds to re-generate our business. We need the assistance of local government support. The floods ruined almost every thing we have worked hard for these past 10 years.

4. **What is your understanding of the following: flood vulnerability and flood adaptation?**

Flood vulnerability: how floods affect you, your environment, business or the local community around).

Flood adaptation: how you recover and fix all the other effects of floods good or bad.

Page | 9



Worst Response

12:35

02:55 sec

Lodge

Bed + Breakfast

Mopani Region

Interview 8:

1. **What is your take on tourism in your area*?** (i.e., this may be the surrounding environment of your establishment, the entire region/district or just specific parts if you wish to give reference to them).

Tourism is good for the area. Tourism brings a lot of visitors (tourists) to the area. As far as I am concerned tourism is important.

2. **What is the weather like during the summer months in that area*?**

Mild to hot summer

Rain

3. **Have you experienced a flood** (i.e., personal, your establishment or whilst being in the area*) **and if yes, provide an explanation of your experience.**

No, we were not directly affected, but an establishment close by was affected and that helped us to prepare for future floods in the area.

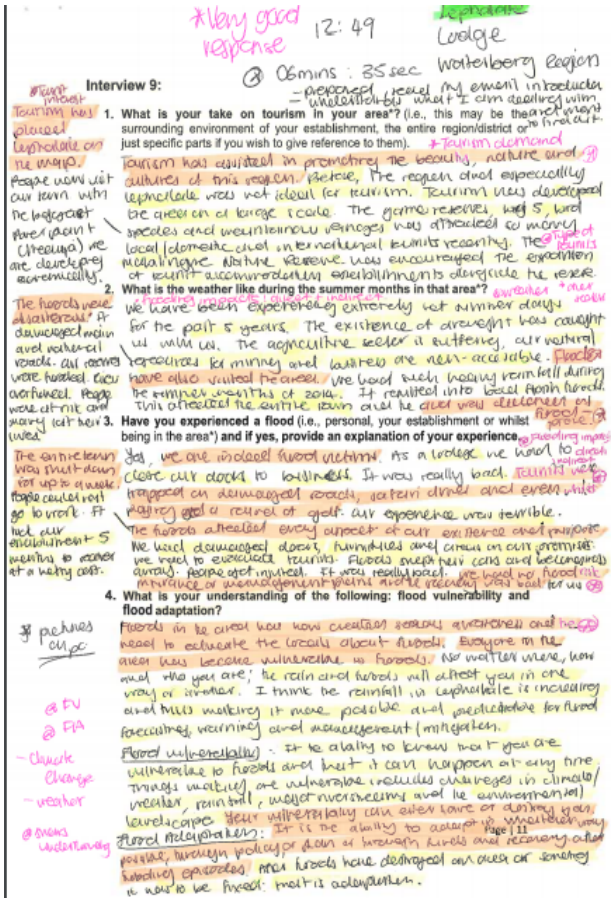
4. **What is your understanding of the following: flood vulnerability and flood adaptation?**

Floods carried threatening many things in the area/south area.

Flood vulnerability: mitigation

Flood adaptation: adaptation plans.

Page | 10



Very good response

12:49

Lodge

Waterberg Region

Interview 9: 06mins : 35sec

1. **What is your take on tourism in your area*?** (i.e., this may be the surrounding environment of your establishment, the entire region/district or just specific parts if you wish to give reference to them).

Tourism has assisted in promoting the beauty, nature and cultures of this region. Before, the region and especially Lephalale was not known for tourism. Tourism has developed the area on a large scale. The game reserves, many 5, bird species and mountainous ranges has attracted so many local/domestic and international tourists recently. The number of tourist accommodation establishments alongside the river

2. **What is the weather like during the summer months in that area*?**

We have been experiencing extremely hot summer days for the past 5 years. The existence of drought has caught us unaware. The agriculture sector is suffering, our natural resources for mining and business are non-accessible. Floods have also visited the area. We had such heavy rainfall during the summer months of 2014. It resulted into local flash floods. This affected the entire town and the river was overflowing.

3. **Have you experienced a flood** (i.e., personal, your establishment or whilst being in the area*) **and if yes, provide an explanation of your experience.**

Yes, we are indeed flood victims. As a lodge we had to close our doors to business. It was really bad. Tourists were trapped on damaged roads, potholes filled and even water rushing and roared at golf. Our experience was terrible. The floods affected every aspect of our existence and purpose. We had damaged doors, furnitures and cracks on our premises. We had to evacuate tourists. Floods swept cars and belongings away. People got injured. It was really bad. We had no flood risk insurance or management plans in the province and had to

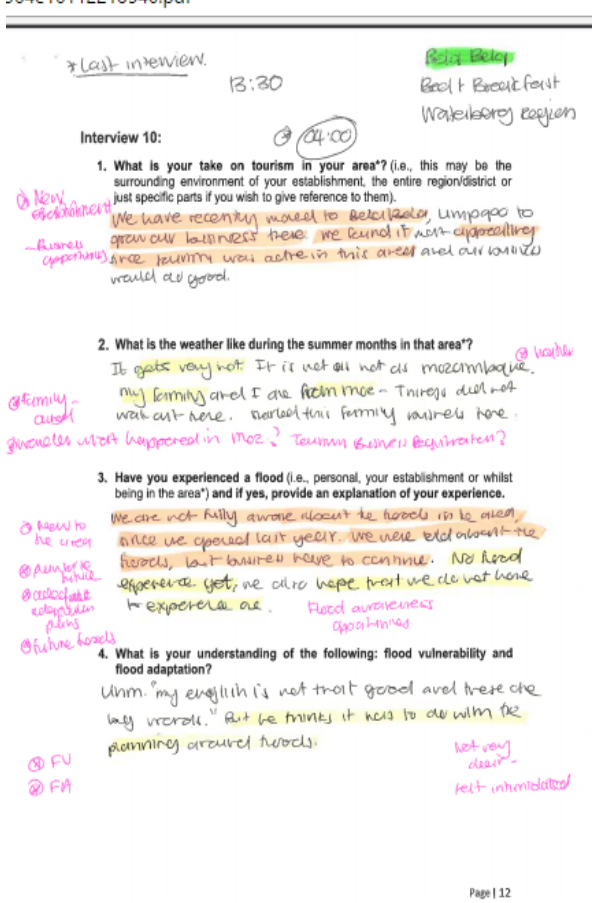
4. **What is your understanding of the following: flood vulnerability and flood adaptation?**

Floods in the area how communities should be aware and the need to educate the locals about floods. Everyone in the area has become vulnerable to floods. No matter where, how and who you are, the rain and floods will affect you in one way or another. I think the rainfall in Lephalale is increasing and this making it more possible and predictable for flood forecasting, warning and management (mitigation).

Flood vulnerability: It is the ability to know that you are vulnerable to floods and that it can happen at any time. Things mainly are vulnerable (includes changes in climate/ weather, rainfall, water movements and the environment) landscape. Your vulnerability can either save or destroy you.

Flood adaptation: It is the ability to adapt to weather, may be water, through policy or plan of how to avoid floods and recovery after flooding episodes. How floods have destroyed our area or society in order to be aware that is adaptation.

Page | 11



Last interview.

13:30

Bela Bela

Bed + Breakfast

Waterberg Region

Interview 10: 04:00

1. **What is your take on tourism in your area*?** (i.e., this may be the surrounding environment of your establishment, the entire region/district or just specific parts if you wish to give reference to them).

We have recently moved to Bela Bela, Limpopo to grow our business here. We found it very appealing since tourism was active in this area and our business would do good.

2. **What is the weather like during the summer months in that area*?**

It gets very hot. It is not all not do uncomfortable. My family and I are from Moz - Things don't work out here. Worried that family matters here (Zimbabwe) what happened in Moz? Tourism business deprivation?

3. **Have you experienced a flood** (i.e., personal, your establishment or whilst being in the area*) **and if yes, provide an explanation of your experience.**

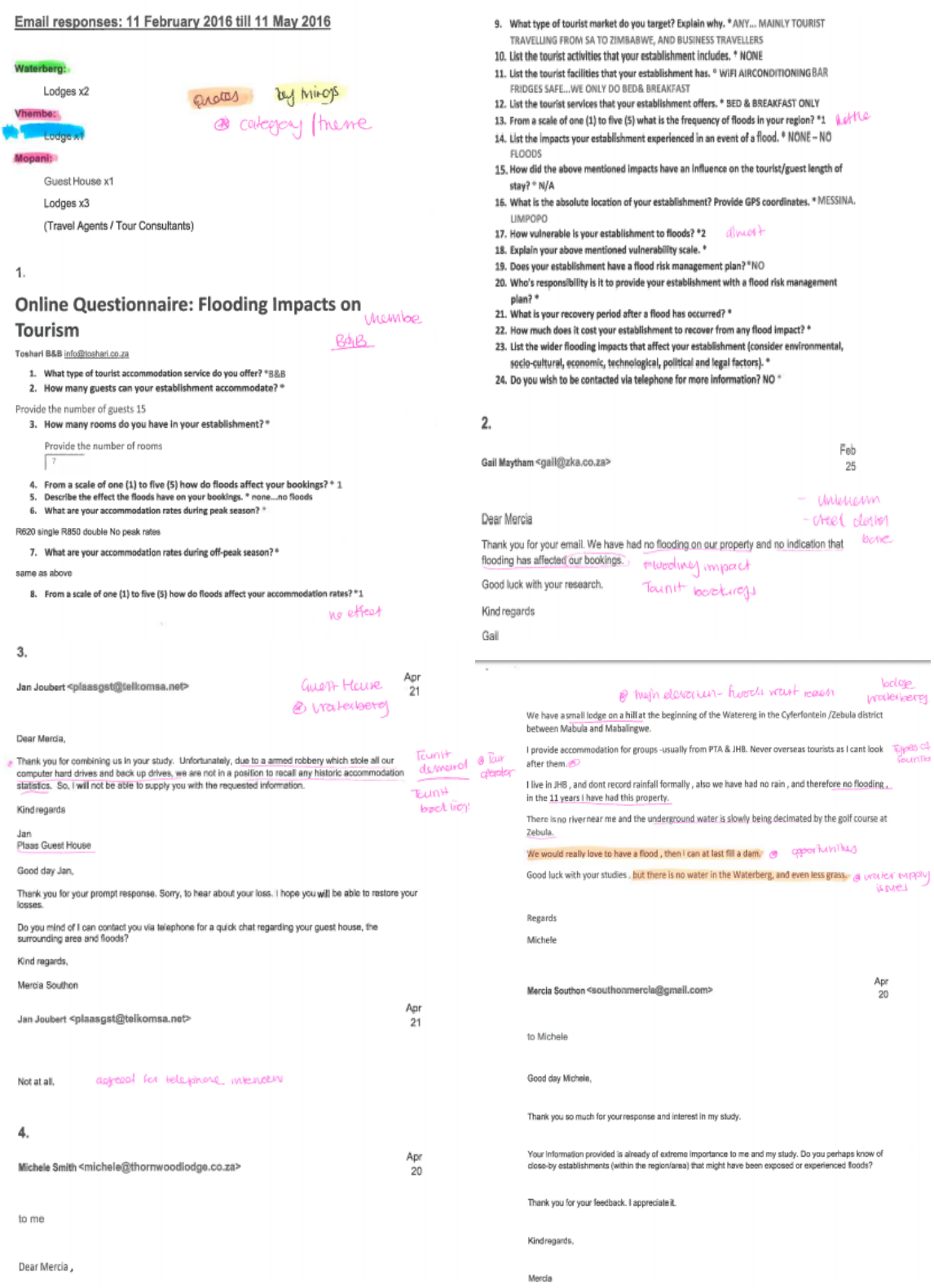
We are not fully aware about the floods in the area since we opened last year. We were told about the floods, but business have to continue. No flood experience yet, we also hope that we do not have to experience one. Flood awareness opportunities

4. **What is your understanding of the following: flood vulnerability and flood adaptation?**

Umm. my english is not that good and these are big words. But he thinks it has to do with the planning around floods.

Page | 12

Appendix F: Email responses



Email responses: 11 February 2016 till 11 May 2016

Waterberg:

Lodges x2

Vhembe:

Lodge x1

Mopani:

Guest House x1

Lodges x3

(Travel Agents / Tour Consultants)

1.

Online Questionnaire: Flooding Impacts on Tourism

Toshari B&B info@toshari.co.za

1. What type of tourist accommodation service do you offer? *B&B
2. How many guests can your establishment accommodate? *

Provide the number of guests 15

3. How many rooms do you have in your establishment? *

Provide the number of rooms

7

4. From a scale of one (1) to five (5) how do floods affect your bookings? * 1
5. Describe the effect the floods have on your bookings. * none...no floods
6. What are your accommodation rates during peak season? *

R620 single R850 double No peak rates

7. What are your accommodation rates during off-peak season? *

same as above

8. From a scale of one (1) to five (5) how do floods affect your accommodation rates? *1

3.

Jan Joubert <plaasgst@telkomsa.net> Apr 21

Dear Mercia,

Thank you for combining us in your study. Unfortunately, due to a armed robbery which stole all our computer hard drives and back up drives, we are not in a position to recall any historic accommodation statistics. So, I will not be able to supply you with the requested information.

Kind regards

Jan
Plaas Guest House

Good day Jan,

Thank you for your prompt response. Sorry, to hear about your loss. I hope you will be able to restore your losses.

Do you mind if I can contact you via telephone for a quick chat regarding your guest house, the surrounding area and floods?

Kind regards,

Mercia Southon

Jan Joubert <plaasgst@telkomsa.net> Apr 21

Not at all.

4.

Michele Smith <michele@thornwoodlodge.co.za> Apr 20

to me

Dear Mercia ,

9. What type of tourist market do you target? Explain why. * ANY... MAINLY TOURIST TRAVELLING FROM SA TO ZIMBABWE, AND BUSINESS TRAVELLERS
10. List the tourist activities that your establishment includes. * NONE
11. List the tourist facilities that your establishment has. * WIFI AIRCONDITIONING BAR FRIDGES SAFE...WE ONLY DO BED& BREAKFAST
12. List the tourist services that your establishment offers. * BED & BREAKFAST ONLY
13. From a scale of one (1) to five (5) what is the frequency of floods in your region? *1
14. List the impacts your establishment experienced in an event of a flood. * NONE – NO FLOODS
15. How did the above mentioned impacts have an influence on the tourist/guest length of stay? * N/A
16. What is the absolute location of your establishment? Provide GPS coordinates. * MESSINA, LIMPOPO
17. How vulnerable is your establishment to floods? *2
18. Explain your above mentioned vulnerability scale. *
19. Does your establishment have a flood risk management plan? *NO
20. Who's responsibility is it to provide your establishment with a flood risk management plan? *
21. What is your recovery period after a flood has occurred? *
22. How much does it cost your establishment to recover from any flood impact? *
23. List the wider flooding impacts that affect your establishment (consider environmental, socio-cultural, economic, technological, political and legal factors). *
24. Do you wish to be contacted via telephone for more information? NO *

2.

Gail Maytham <gail@zka.co.za> Feb 25

Dear Mercia

Thank you for your email. We have had no flooding on our property and no indication that flooding has affected our bookings.

Good luck with your research.

Kind regards

Gail

We have a small lodge on a hill at the beginning of the Watereng in the Cyferfontein /Zebula district between Mabula and Mabalingwe.

I provide accommodation for groups -usually from PTA & JHB. Never overseas tourists as I cant look after them.

I live in JHB , and dont record rainfall formally , also we have had no rain , and therefore no flooding , in the 11 years I have had this property.

There is no river near me and the underground water is slowly being decimated by the golf course at Zebula.

We would really love to have a flood , then I can at last fill a dam.

Good luck with your studies , but there is no water in the Waterberg, and even less grass.

Regards

Michele

Mercia Southon <southonmercia@gmail.com> Apr 20

to Michele

Good day Michele,

Thank you so much for your response and interest in my study.

Your information provided is already of extreme importance to me and my study. Do you perhaps know of close-by establishments (within the region/area) that might have been exposed or experienced floods?

Thank you for your feedback. I appreciate it.

Kind regards,

Mercia

Michele Smith <smithres@icon.co.za> Apr 20

to me

Thats fine .

I know there have been 2 very big floods in Warmbaths town . Not the Klein Kariba dam that burst .

Because of the bad road drainage!!!!

The river running through the town actually runs through the roads when there is a big storm.

Otherwise we are badly situated in a rain shadow and dont have any of that,

Regards

M

From: Mercia Southon [mailto:southonmercia@gmail.com]
Sent: 20 April 2016 10:48 AM
To: Michele Smith
Subject: Re: ONLINE QUESTIONNAIRE: FLOODING IMPACTS ON TOURISM (WATERBERG) *

Michele Smith <michele@thornwoodlodge.co.za> Apr 20

Just thinking .

Have you got all the establishment in the areas' addresses from Bela Bela Tourism?

They have 200 places on their books.

M

From: Mercia Southon [mailto:southonmercia@gmail.com]
Sent: 20 April 2016 10:48 AM

Last year the resort dam burst , from rain , but that water also flowed through town from the Nylstroom road side.

The town drainage is in poor condition -so theses may not have been "floods" if the municipality worked properly.

This is just what I remember , but I dont live there.

Ill see if I have an email with the addresses. but im not sure.

Regards

M

5.

camdeco@yahoo.com Apr 20

Good day Mercia . Regarding the above subject I have to inform you that we sold our guest house known as Groot Valley Guest House 3 years ago. Unfortunately we do not have contact with the present owners.
Kind regards. Daan Calitz.

Sent via my BlackBerry from Vodacom - let your email find you!

Mercia Southon <southonmercia@gmail.com> Apr 20

Hi Daan,

Thank you for your response and informing me about the change in ownership. I will have a look and try get hold of the new owners.

If you don't mind me asking, for how long did you own the guest house and whilst owning it, did you experience any floods?

Kind Regards,

Mercia

To: Michele Smith
Subject: Re: ONLINE QUESTIONNAIRE: FLOODING IMPACTS ON TOURISM (WATERBERG) *

Mercia Southon <southonmercia@gmail.com> Apr 20

Hi Michele,

Your input really means so much - thank you.

How recent were the floods in the Warmbaths area?

I did an internet search and location run on the areas that might be/have been affected by floods in the past 10 years. Do you know how one can access the 200 places and addresses?

Can I perhaps give you a ring when you are free and available to have a quick 3min chat over the phone? This can be anytime if you do not mind? Your input is of extreme importance.

Thank you,

Mercia

Michele Smith <michele@thornwoodlodge.co.za> Apr 20

to me

Hi .

Sorry , I work in JHB , mad day.

The floods will be remembered by the chaps -ladies at the tourism office.

014-736-3852.

I dont know many people in town.

The one flood that was exceptional was in 2000, when we bought our first little farm near town.

Couldnt get in or out .

Then in 2007 - then I had a tenant at the farm and she broke her car in the mud trying to get in from Roodepoort -4km from town.

camdeco@yahoo.com Apr 20

Hallo Mercia. We had the guest house for 10 years. The guest house is on a small holding with mostly level ground. We did not have any floods during the 10 years period. We wish you all the best of luck with your study. Kind regards.

6.

Gavin Hatherley gm@kaingo.co.za via grofin.onmicrosoft.com Apr 21

Dear Mercia

Thank you for your email.

Kaingo has not been operating as a commercial lodge for the past six years, and therefore has not had any guests.

As a result, unfortunately, we do not have any relevant data for you.

I wish you the best of luck with your studies!

Kind regards

Gavin

Gavin Hatherley, General Manager
Ka'Ingo Private Game Reserve
Witfontein, Buigerlver, Vaalwater, Limpopo,0530
PO Box 580, Vaalwater,0530
Tel: +27 (0)14 754 8000 or +27 (0)87 805 0985
Fax: +27 (0)14 754 8006
web: www.kaingo.co.za
This message is subject to a disclaimer atwww.kaingo.co.za

Mercia Southon <southonmercia@gmail.com> Apr 21

Good day Gavin,

Thank you for your prompt response and the information you provided.

Are you perhaps aware of any establishments nearby that has been exposed to floods?

Gavin Hatherley gm@kaingo.co.za via grofin.onmicrosoft.com — Apr 21

Hi, Mercia

Perhaps you can email the CEO of Welgevonden Game Reserve, who will be able to pass you on to one of their 50 or so lodges.

I am not sure if they were affected by the floods a few years back, but he should be able to help you. His name is Bradley Schroder - Bradley@welgevonden.org

Unfortunately, I am quite new in the area

Best wishes,

Gavin

7.

Ursula Montgomery <gmclifftop@clifftoplodge.com> — Apr 24

Hello Mercia

I would normally be happy to help you, but unfortunately we have been burnt in the past with handing out this information.

Should you have any questions please feel free to give me a call and will help you to the best of my ability, but unfortunately this information pertaining to the lodge direct and I cannot assist you with your full request.

Sincerely,

Ursula

Clifftop Exclusive Safari Hideaway
P.O. Box 523
VAALWATER
0530
Tel: 014 755 4920/19

Fax: 014 755 4918
Reservations: 011 516 4367

Mercia Southon <southonmercia@gmail.com> — Apr 24

Dear Ursula,

Thank you for your response and I completely understand.

Sorry to hear that. Okay, I would be more than happy to chat to you via telephone. I am mostly just interested in your perception as an owner, manager or the admin as to how floods had/might have an impact on your establishment, business and the surrounding area.

I hope you are fit in answering that? When will you be free and available for a quick chat?

Kind regards,

Mercia

Ursula Montgomery <gmclifftop@clifftoplodge.com> — Apr 25

Hello Mercia

The floods did affect us but as we were covered by insurance we received money back for the bookings that we had lost and guests were most understanding. The reserve made a decision to close down for 7 days to give the waters time to subside.

The largest cost from our side – was due to our access road being closed once the reserve reopened we had to collect guests at the main gate instead of the east gate which was and additional 30 min trip one way, and it was difficult to get guests to all arrive round the same time, and therefore some guests waited along time before they could get to the lodge.

See below a summary of our rainfall for the past 4 years – up to including today.

	2012/2013	2013/2014	2014/2015	2015/2016
September	3	0	0	15
October	100.5	59.5	38	48.5
November	118	72	97	75
December	186.5	143	97.5	43.5
January	70	107.5	68	76.5
February	74	121.5	98	29.5
March	15.5	307	39.5	125
April	107	35	0	0
May	0	2	0	0
June	0	0	0	0
July	0	0	12	0
August	0	0	0	0
Total	674.5	847.5	470	413

We run on an occupancy of about 65 – 75% most months – some months we hit the 80's.

We are a small lodge comprised of 8 room = 16 beds.

Hope this is of help to you.

Regards

Ursula

8.

Gill Smithies <moramist@vodamail.co.za> — Apr 26

Good day Mercia,

I have just picked up your email – apologies for not replying sooner.

Unfortunately I no longer live in the Limpopo area and haven't done so for the last four years. If you want information prior to this time I may be still be able to help you.

If I am too late to assist in this instance, perhaps I can assist with the proofing of your study as I am a qualified Proofreader and have Wits, TUT, UKZN and NWU as my clients.

Looking forward to hearing from you

Regards,

Gill Smithies
Freelance Proofreader
071 352 5410

9.

Safari Destinations BOOKINGS <bookings@safaridestinations.co.za> — Apr 19

to enquiries, Phelwana, info, pezlodge, Karongwe, Indlovu, res, reservations, reservations, May, reservations, Mohlabetsi, Moholoholo, Nedile, reservations, waterberg, Sibongile, info, info, Reservations, reservations, Izintaba, Taaibos, info, info

Dear Lodges,

Please refer to the email from Mercia Southon below and act accordingly should you be able to assist her with her study with regards to the flooding impact on tourist accommodation establishments in the Mopani, Waterberg & Vhembe regions.

Regards

Ronel

Ronel van Deventer (reservations, marketing): +27 (0) 82 322 8357 (all hours)
bookings@safaridestinations.co.za or safari@telkomsa.net or safarilodges@worldonline.co.za

Safari Destinations BOOKINGS <bookings@safaridestinations.co.za> — Apr 19

Hope they will be able to assist you.

a pity you didn't get the area covering the Timbavati, Sabi Sands, Krugeras the lodges in these areas were badly affected by floods. There were some lodges that were totally destroyed, some were rebuilt but others just never opened again.

I'm a tour operator using mostly the mentioned areas and even I experienced huge losses. Not only money but time as well. Because during the floods I had to do the work all over again where I closed a file on clients I had to start from scratch again finding alternative accommodation which result in losing out on new business as there was just not enough time to look after new clients as well.

Good luck

Ronel

Mercia Southon <southonmercia@gmail.com> — Apr 20

Dear Ronel,

thank you for showing such interest in my study

Your input is of extreme importance to my study. No, I do not cover those areas (Mpumalanga Province), but information relating to my study topic (flooding impacts on tourism) will be very much appreciated. The aim is eventually to include more areas (provinces) and eventually SA as a whole at a later stage.

Do you mind if I can contact you for more insight on your experience and losses as a Tour Operator?

Thank you for your feedback.

Kind regards,

Mercia

Safari Destinations BOOKINGS <bookings@safaridestinations.co.za> Apr 20

agreed to telephone interview + interest email + questionnaire

Mercia, don't mind. Depends on what kind of questions you'll be asking. I'll for instance not be able to provide you with exact figures / statistics or dates as this would mean I'll have to go dig for it and at this stage I just don't have the time for it.

Ronel

10.

Mopani Farm house

Hello Mercia

Thank you for your email. Yes we are in the Mopani area, but we have not had any flooding in Magoebaskloof in the past 10 years, hence no impact on tourism.

May be tourism establishments in and around Phalaborwa or Hoedspruit areas would be of more help in providing data to you.

Flood affected areas

Wishing you all the best.

Cordially yours

Shahrzad Hone

www.kuhestan.co.za , C: +27 82 903 7593, F: +27 86 614 4599

Kuhestan Organic Farm <info@kuhestan.co.za> Apr 27

Hello Mercia

Please check any of the following websites for lists of establishments in those areas:

- Booking.com
- SafariNow.com
- SA.Venues
- Sleeping Out

websites for more information contact details

Once you have narrowed down the search to those two areas, jot down the names of the establishments and then look for their own websites – generally they give their contact details and phone numbers. Then you can contact them directly.

All the best.
Cordially yours
Shahrzad Hone

11.

Maduma Boma <info@madumaboma.co.za> Apr 20

Thanks Mercia, Unfortunately we will not be able to assist. Sorry about this.

Thanks and regards,

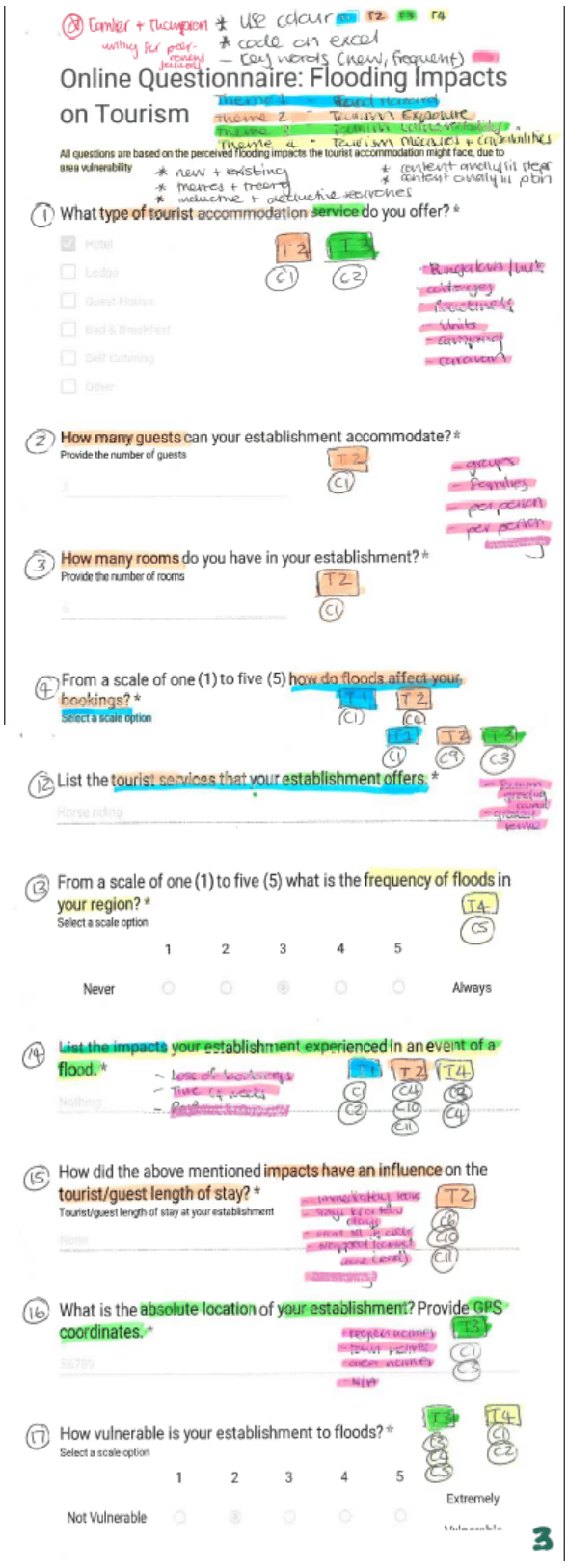
Barry and Sue

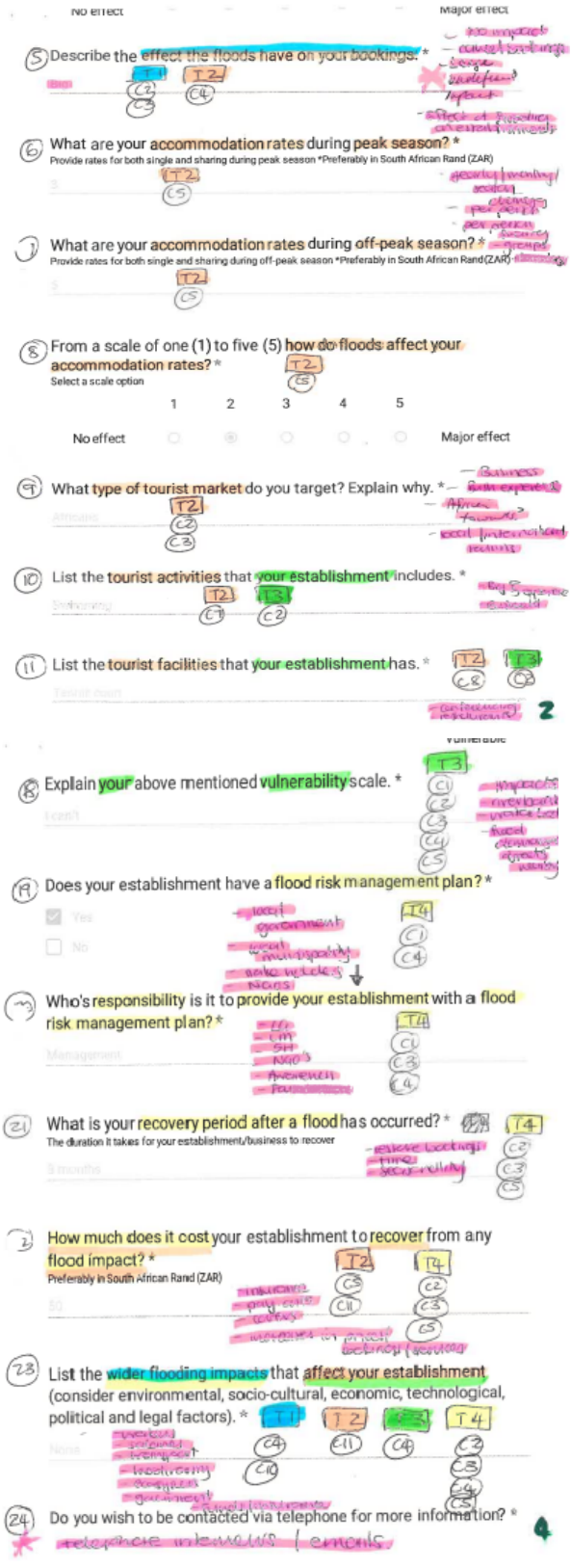
Tel: 015 793 2813 Fax: 015 793 2814

Barry Cell: 082 852 4592 Sue: 082 460 2700

Website: www.madumaboma.co.za

Appendix G: Content analysis manual process





Appendix H: Newspaper articles related to the subject

Limpopo families left homeless after heavy rain

Monday 23 November 2015 22:57
SABC



Nearly 2000 households have been affected, according to the Vhembe District Municipality.(SABC)

TAGS:

- Limpopo
- Vhembe
- Vhembe District Municipality
- Hoedspruit
- Sekhukhune
- Tshamiseka Primary School
- Storm

Gift of the Givers assists Limpopo flood victims

Wednesday 9 April 2014 16:23
Rudzani Tshivhase



The assistance which includes school furniture, food parcels and clothes were donated by various sponsors. (Rudzani Tshivhase)

TAGS:

- Bela Bela
- Lephalale
- Mookgophong
- Waterberg District
- Limpopo
- Gift of the Givers Foundation
- Floods

Several victims of recent floods in Bela Bela, Lephalale and Mookgophong in the Waterberg district of Limpopo are getting humanitarian assistance from the Gift of the Givers Foundation and its partners.

Limpopo floods claim six lives

22 JAN 2013 06:49 SAPA

Six people have died after the Limpopo River burst its banks, says the provincial cooperative governance department.



"Rescue operations in the area have been completed. On the record we have six people who died," the department's spokesperson Dieketseng Diale said on Monday.

Kruger Park closes Crocodile bridge due to flooding

Friday 7 March 2014 11:03
SABC



Most roads and bridges in the south of the park have been affected by the flooding.(SANParks)

TAGS:

- Kruger National Park
- Crocodile Bridge
- Komatipoort
- William Mabasa
- Floods
- Limpopo
- Vhembe
- Vhembe District Municipality
- Matodzi Ralushai
- South African Weather Services

STAATSKOERANT, 7 MAART 2011 No. 34083 11

PROCLAMATION

by the

President of the Republic of South Africa

No. 23, 2011

DECLARATION OF THE STORMS AND FLOODS THAT OCCURRED IN THE LIMPOPO PROVINCE TO BE A DISASTER

Under the powers vested in me by Section 26 of the Fund-raising Act, 1978 (Act No. 107 of 1978), I hereby declare the storms and floods that occurred in the Limpopo Province and caused severe damage and loss during January 2011 in the Mopani District Municipality, the Sekhukhune District Municipality, the Waterberg District Municipality and the Vhembe District Municipality to be a disaster for the purposes of this Act.

Given under my Hand and Seal of the Republic of South Africa at Cape Town this 21st day of February, Two Thousand and Eleven.

PRESIDENT

By Order of the President–in-Cabinet

MINISTER OF CABINET

www.ifrc.org
Saving lives, changing minds.

Emergency Plan of Action (EPoA)
South Africa: Floods

International Federation of Red Cross and Red Crescent Societies

DREF Operation	**Operation n° MDRZA006;** **GLIDE No.** FL-2014-000038-ZAF.
Date of issue: 24 March 2014	**Date of disaster:** 03 March 2014
Operation manager: Levona Van Aarde	**Point of contact:** Dr. Michael Charles
Operation start date: 21st March 2014	**Expected timeframe:** 2 Months
Overall operation budget: CHF 165,035	
Number of people affected: 7,000	**Number of people to be assisted:** 3,525 (705 households) in Waterberg District, Limpopo Province.
Host National Society: The South African Red Cross Society (SARCS)	
Red Cross Red Crescent Movement partners actively involved in the operation: American Red Cross (technical support)	
Other partner organizations actively involved in the operation: South African Government; Limpopo Provincial Government and Gift of the Givers (Local NGO)	

A. Situation analysis

Description of the disaster

From 01 March to 18 March 2014 the north-eastern parts of the country experienced heavy and extended rainfall which led to extensive flooding and landslides. As a result, over 7,000 people have been affected, with 3,525 displaced. The government of South Africa confirms 32 deaths have been reported with others still missing due to flash flooding. The most affected provinces include Limpopo, Mpumalanga, North West and Gauteng.



Informal settlements washed away in Lephalale (photo: SARCS)

Limpopo Province was worst affected with the municipalities of Lephalale, Mogalakwena, Modimolle, Bela-Bela, Thabazimbi, and Mookgopong in Waterberg District hardest hit. The cost of damage to infrastructure (main roads, houses, farmland and tourist centres) are estimated in millions of US dollars. Most community members have evacuated or been evacuated to evacuation centres set up by Government in community halls, creches, schools. Emergency Response Teams from government, private sector, military, NGOs and the red cross have been working together to evacuate flood affected communities.

Flood-hit Limpopo district could be declared disaster area

2013-01-23 08:37
City Press

Limpopo has recommended that the flood-hit Vhembe district be declared a disaster area.

Co-operative governance, human settlements and traditional affairs MEC Clifford Motsepe made the recommendation after hundreds of people were left homeless and several dead in floods over the past few days, reported The New Age newspaper.

District municipality spokesperson Matodzi Ralushai said: “The process of officially declaring the place a disaster area could be done any time now.

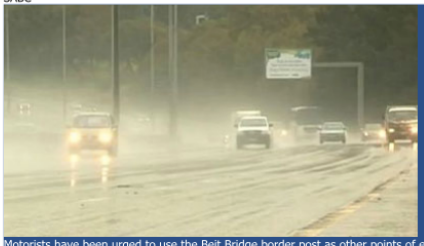
“People, including foreign nationals, are still at assembly points in Musina, where 200 houses collapsed.”

Damage assessment was still under?way.

Reports on the number of deaths as a result of the floods have ranged from 10 to 15, and the authorities said they are still in the process of compiling all the information from affected areas.

Floods cause two SA, Botswana border closures

Saturday 15 March 2014 07:03
SABC



Motorists have been urged to use the Beit Bridge border post as other points of entry between South Africa and Botswana have been closed due to flooding(SABC)

TAGS:

- South Africa
- Botswana
- Sam Muremi
- Beit Bridge
- Klip Fontein
- Bela Bela
- Lephalale
- Waterburg

Flood warning for Limpopo

Friday 14 March 2014 05:59
SABC

Flooding spreads to 3 provinces in South Africa

6 MARCH, 2014 BY ED HILL IN AFRICA

14

Further reports emerged yesterday afternoon of the extent of flooding in the northern parts of South Africa, with a woman missing after her car was swept away by floodwaters in Brits, Northwest Province, on Tuesday.

Northwest Province

Emergency services divers were called after the woman and her car disappeared under waters estimated to be 7m deep. Four other occupants of the vehicle were rescued. The 56-year old woman’s car was one of four washed away after a low-level bridge near the Brits shopping centre was overtopped by floodwaters.

Two houses were reported to have collapsed as a result of flooding in Majakeng, near Mooinooi and another 30 were flooded.

The sluice valves of the Hartebeespoort Dam, which was overflowing, have been opened and people living downstream of the dam have been urged to alert authorities to any threat of flooding.

Spokesman Lesiba Kgwele said the province’s disaster management centre and emergency services have been placed on high alert as the SA Weather Service has forecast more heavy rain in the province over the next few days.

Limpopo families hit by floods

NEWS/SOUTH-AFRICA/LIMPOPO /
20 January 2012 at 13:06pm

A total of 220 families have been affected by this week's floods in Maruleng, the Limpopo department of human settlements said on Friday.

According to a preliminary assessment, 101 families were in need of immediate shelter and tents were being provided for them, said spokeswoman Tseng Diale.

All 220 families had received food parcels.

The worst-affected community was that of Mulalane village, where 20 families had been left homeless.

" (The department) will assist and support both local and district municipalities with some items of relief it has in stock," said Diale.

The SA National Defence Force, the SA Air Force, police divers, search and rescue teams, the fire brigade, and disaster and emergency management services had helped with evacuations and relief efforts.

Floods ravage Limpopo community

2013-01-22 15:49

Dane McDonald, News24



Heavy flooding has ravaged the farming community along the Limpopo River (Elana Treu-Viljoen, Supplied)



Credit: Independent Newspapers

The Sand River in Mpumalanga became a raging torrent after the recent heavy rains. File picture: Itumeleng English

70 airlifted from flood-hit Lephalale

NEWS/SOUTH-AFRICA/LIMPOPO /
13 March 2014 at 16:49pm
By: SAPA

Polokwane - Seventy people were airlifted to safety from a hill in Lephalale, Limpopo, on Thursday, paramedics said.

Limpopo floods knock tourism

SOUTH AFRICA
Sunday 16 March 2014 - 7:18am

Bela-Bela, Limpopo, March 15 - Residents are counting the cost of this week's floods. The area depends on tourism and game lodges say business has taken a knock because of damaged infrastructure. Video: eNCA

BELA-BELA - Game farmers in Bela-Bela are hoping things return to normal in the small town before the upcoming long weekend.

The Limpopo town flooded after heavy rains caused a dam wall to collapse.
The area depends on tourism and game lodges say business has taken a knock because of damaged infrastructure.
Owners of the private dam that burst say they've had to limit their safari offering

And while authorities are still assessing the extent damage, they're also want to declare the town a disaster zone.

Bodies still missing as flood waters recede

NEWS/SOUTH-AFRICA/LIMPOPO /
12 March 2014 at 18:32pm
By: Mpho Raborife

Johannesburg - Four people were still missing in Mpumalanga and Limpopo on Wednesday after extensive flooding in several parts of the country.

Two women, aged 64 and 69, have been missing from Makhado and Bela-Bela since the weekend, Brigadier Hangwani Mulaudzi said.

"She [the 64-year-old from Makhado] left Tshitale village in the morning to get some wood. She had to cross the Mambedi river at some point and her dog, which she usually travels with, returned to the house alone."

Persistent rain made it difficult to recover the body of a 69-year-old woman who was swept away with her husband while swimming in Bela-Bela at the weekend.

The two were swimming in an undercover swimming pool at the Kariba Lodge on Friday when the Bela-Bela dam overflowed and they were swept away.

The body of her 74-year-old husband was found on Saturday.

Bela Bela counting the costs after heavy rains

Monday 17 March 2014 20:52
SABC



Last week, Bela Bela recorded 180 millimeters of rain in just one hour. (SABC)

TAGS:
- Limpopo
- Bela Bela
- Rains

Limpopo's Bela Bela municipality is counting the cost after the aftermath of pounding, incessant rains. Most of the damage was restricted to the Klein Kariba holiday resort. An elderly couple was swept away and drowned.

The Eskom power plant was also damaged but electricity has been restored. The industrial centre and several houses were also at the mercy of Mother Nature. The Municipal spokesperson, Matome Sebelebele has assured that everything is back to normal.

Last week the town recorded 180 millimeters of rain in just one hour. Two dams on a resort just outside town burst its banks, flooding a neighbouring resort.

Dam bursts, floods Bela Bela

NEWS/SOUTH-AFRICA/LIMPOPO /
13 March 2014 at 19:01pm
By: SAPA

Polokwane - The town of Bela Bela in Limpopo and surrounding areas were flooded on Thursday when a dam wall gave way, police said on Thursday.

"There is water all over Bela Bela, rescue efforts by the police and the municipality's emergency services are underway," said spokesman Brigadier Hangwani Mulaudzi.

Helicopters were used to rescue residents from the area.

A nearby informal settlement was severely affected, with no injuries or deaths reported, Mulaudzi said.

Last week, the dam overflowed, sending waves of water into the streets and homes.

An elderly couple were washed away on Friday at the resort Klein Kariba outside Bela Bela when another dam gave way after persistent rains the past week.

Deputy Minister Rejoice Mabudafhasi's speech on the occasion of the Severe Weather Road Show

Thohoyandou Town Hall, Limpopo, 26 February 2013

Programme Director;
Executive Mayor of Vhembe District Municipality: Cllr Matibe;
Mayor of Thulamela Municipality: Cllr Mahosi;
Councillors;
CEO of the South African Weather Service: Dr Makuleni
Representatives from Disaster Management;
South African Weather Service Top Management and Staff;
Senior government officials;
Members of the community;
Members of the media;
Ladies and gentlemen

Ndi Matsheloni.

Let me convey our sincere appreciation to the leadership and community members of Vhembe District Municipality under the stewardship of Your Worship, the Executive Mayor, Councillor Matibe for the warmth welcome here in the far northern part of Limpopo Province – Africa's Eden.

Allow me from the onset to commend the South African Weather Service, municipalities, provincial and local disaster management structures, and community leaders for their commitment and dedication shown towards this initiative that seeks to raise awareness on severe weather patterns and I hope that the community members will become empowered in terms of weather awareness today.



Credit: SA AIRFORCE

In scenes reminiscent of the floods that struck Mozambique in 2000, when mothers and children were rescued from tree and roof tops, Warrant Officer N Klopper went to the aid of a mother and her young child in a flood-hit area. Photo: Piet Paxton

High drama in flood rescue

NEWS/SOUTH-AFRICA/LIMPOPO /
20 January 2012 at 07:45am
By: GRAEME HOSKEN AND YOLANDE DU PREEZ

Hundreds of people, including primary school children, left destitute and stranded by days of heavy rain and flooding in Mpumalanga and Limpopo, have been plucked to safety by air force and police helicopters.

The two-day high-risk aerial and ground rescue, which has developed into a humanitarian relief mission, was launched after rain deluged large sections of the

Concerns raised over Limpopo's disaster centres

Tuesday 15 December 2015 12:23
Rudzani Tshivhase



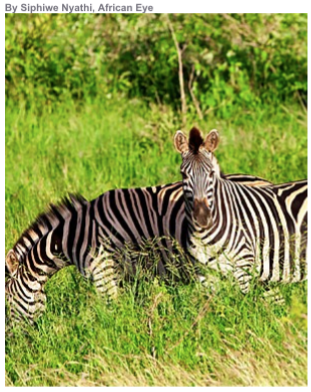
Houses, schools, church buildings, and power lines are some of the infrastructures damaged during the storm. (SABC)

TAGS:

- Limpopo
- Vhembe
- Makhado
- Rudzani Tshivhase
- Storm
- Louis Bobodi
- Matodzi Nyadzani

Economy, flood blamed for Limpopo tourism drop

Jan 13 2014 05:30
By Siphiwe Nyathi, African Eye



(Shutterstock)

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- SA's hunting revenue dives by R90m
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- More Middle Eastern tourists wanted in SA

One drowns, two missing in Limpopo floods

Sunday 9 March 2014 11:30
SABC



Police say a dam wall in Bela Bela collapsed under pressure due to heavy rainfall. (SABC)

TAGS:

- Floods
- Rain
- Weather
- Limpopo
- Bela Bela
- Mokopane
- Hangwani Mulaudzi
- Mpumalanga

One person has drowned and two are missing after heavy floods hit parts of Limpopo. Police say a dam wall in Bela Bela collapsed under pressure due to heavy rainfall.

The water rushed out and swept away an elderly couple in its wake. Search and rescue teams have are still searching for one body.



Credit: TWITTER

A Limpopo road collapsed between Vaalwater and Modimolle. Photo: Twitter

Premier to assess flooded Lephalale

NEWS/SOUTH-AFRICA/LIMPOPO /
13 March 2014 at 10:55am
By: Sapa

Johannesburg - Limpopo premier Stan Mathabatha and four MECs will assess the extent to which the flooding in Lephalale has affected residents and infrastructure, his department said on Thursday.

Warnings of possible floods in Limpopo

Tuesday 4 March 2014 14:50
SABC



There has been heavy rainfall in the province since the weekend(SABC)

TAGS:

- Thabazimbi
- Lephalale
- Bela Bela
- Tzaneen
- Thohoyandou
- Phalaborwa
- Hoedspruit
- SAWS
- Limpopo
- Punda Maria

The South African Weather Services has issued a warning for possible floods in some parts of Limpopo starting from Wednesday. There has been heavy rainfall in the province since the weekend.

PICS: Spar near Kruger Park flooded

2016-03-10 14:03



A Spar flooded in Mpumalanga. (Intelligence Bureau SA, Facebook)

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Related Links

- Kruger flood closures: Sabie and Sand River re-opened
- PICS: Heavy rains hit Kruger National Park, bridges flood
- ALERT: Kruger roads, bridges and gate closed due to flooding

Weather Service issues flood warning

Thursday 10 March 2016 07:39
SABC



Flooding has already been reported in some low-lying places. (SABC)

TAGS:

- Gauteng
- Mpumalanga
- Limpopo
- South African Weather Services
- Floods
- Rain

The SA Weather Service has warned of heavy downpours and possible flooding in Gauteng, Mpumalanga and southern Limpopo until the weekend.

Heavy rain has fallen throughout the night in large parts of Gauteng, Mpumalanga and southern Limpopo, relieving the recent drought conditions but causing disruptions.

Flooding has already been reported in some low-lying places.

BusinessDay
NEWS WORTH KNOWING National

Weather stabilises, search and rescue teams still on high alert

BY WYNDHAM HARTLEY, MARCH 17 2014, 14:44



Picture: THINKSTOCK

THE rainy weather and flooding that has seriously affected provinces across South Africa has stabilised and emergency services have stood down, but search and rescue teams remain on high alert, Deputy Co-operative Governance and Traditional Affairs Minister Andries Nel said on Monday.

The worst affected provinces were North West, Limpopo, Mpumalanga, Gauteng and KwaZulu-Natal, where the flooding had resulted in 32 deaths, with a number of people still missing or displaced, Mr Nel told a news conference in Cape Town.

He said only Limpopo had indicated that it intended to declare a local disaster, in the Waterberg district municipality.